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ITALY (WITH POSSESSIONS) INTELLIGENCE REPORT
OCT. 1942

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1942

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C.B. 1712 (X/1) (10/42)

VOLUME I

(For ex-posessions see Volume II)

ITALY

(WITH POSSESSIONS)

INTELLIGENCE REPORT

OCTOBER, 1942

VOLUME I

(For ex-posessions see Volume II)

ITALY

(WITH POSSESSIONS)

INTELLIGENCE REPORT

OCTOBER, 1942

934

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SUBSEQUENTLY CORRECTED TO:

THIS FOLDER

CONTAINS PAPERS

FROM Oct 1943

TO

CATALOGUE.

(For PLANS, see C.B. 1712 (PLANS))

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Declassified E.O. 12356 Section 3.3/NND No. 785015

CERTIFICATE OF INSERTION OF AMENDMENTS, ETC.

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C.B. 1712 (X/1) (10/42)

VOLUME I

(For ex-poseessions see Volume II)

ITALY

(WITH POSSESSIONS)

INTELLIGENCE REPORT

OCTOBER, 1942

3438

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INTELLIGENCE REPORT

OCTOBER, 1942

3438

(This book supersedes C.B. 1712 (X/1) (1/42), which is to be destroyed by fire and a destruction certificate rendered to the Admiralty.)

NAVAL INTELLIGENCE DIVISION,
ADMIRALTY.

N.I.D. 05300/42.

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INTRODUCTION

1. The following books and plans, the distribution of which is similar to that of this Intelligence Report, contain information supplementary to the Report, and should be read in conjunction with it:—

- Dock Book (Foreign Docks)—C.B. Series.
- Half-Yearly Return of War Vessels and Aircraft (British and Foreign)—C.B. Series.
- International List of Radio-Telegraph Stations (Berne List).
- Ports and Anchorages—C.B. Series.
- Quarterly Return showing Distribution of Foreign War Vessels and Aircraft—C.B. Series.
- Routes for Merchant Vessels on Outbreak of War—C.B. Series.
- Sailing Directions.
- Sources of Supply (Foreign Ports) of Coal, Oil and Fresh Provisions—O.U. Series.
- Submarine Telegraph Cables, Mediterranean, Black and Red Seas (Fleet Telegraph Chart, Folio O.T.).
- W/T Board List of Wireless Stations and Call Signs—C.B. Series.
- Naval Air Pilot—Mediterranean, Sections I and II—C.B. Series.
- Naval Air Pilot—Red Sea—C.B. Series.
- I.S.I.S. Report on Sardinia, C.B. 4096G.
- I.S.I.S. Report on Sicily, C.B. 4096H, with Addendum on Calabria.

SECTION III (1), (2) and (3) I

SECTION III

ECONOMICS

General Survey of Material Resources and Industry in their Bearing upon National War Effort

(1) Introduction (General)

The Northern area of ITALY contains half the population, of some 45 millions, and three-quarters of the industrial capacity, which, however, is small in comparison with that of a first class Power and is insufficient to maintain and equip the armed forces which ITALY is capable of mobilizing. ITALY suffers from a shortage of some essential raw materials and of skilled workers, the latter shortage being especially felt in the aircraft industry.

The standard of living is very low and the cost of living has, up to September, 1942, risen by 110 per cent. since ITALY'S entry into the war.

ITALY cannot be regarded as a self-contained economic unit, but merely as a useful accessory to German Europe.

(2) Agriculture

(i) Foodstuffs

ITALY probably produces up to 95 per cent. of her total requirements of essential foodstuffs but even in a year of good harvest, has to import over half a million tons of bread grains. The last two wheat harvests have been somewhat below average. She is also dependent on imports for most of her oil seeds requirements and a part of her meat, although meat consumption per caput is low.

The loss of her AFRICAN possessions has deprived ITALY of dates from LIBYA, coffee from ABYSSINIA and bananas from SOMALILAND, whilst the acquisition of ALBANIA, GREECE and part of JUGOSLAVIA is, on balance, likely to be an additional drain on her food resources.

ITALY exports citrus fruits, vegetables, cheese, wine and rice.

Increased exports to Germany have made up for the loss of exports to other countries.

SICILY has a large surplus of olives and beans and provides 12 per cent. of ITALY'S total production of wheat.

(ii) Other Agricultural Produce

ITALY is seriously deficient in timber and normally imports nearly one million tons, largely from JUGOSLAVIA and AUSTRIA, as well as some 250,000 tons of wood pulp from SCANDINAVIA.

(iii) Fertilisers

ITALY is nearly self-sufficient in nitrogenous fertilisers (mainly sulphate of ammonia), but is entirely dependent on imports for super-phosphates (from French North African phosphate rock) and potash (from GERMANY).

(3) Industry

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(3) Industry

(i) Fuel and Power

(a) *Solid Fuels*.—ITALY'S lack of solid fuel constitutes a very serious weakness. Much of her own production of coal (about four million tons) is of poor quality and she requires to import twelve to thirteen million tons a year, all of which must come from German Europe.

New coke ovens have been built in recent years and the total output now exceeds two million tons, but this is insufficient for the Italian metallurgical industry.

(b) *Liquid Fuels*.—(For further details, see Section V-(3)).—It is estimated that when ITALY entered the war, her oil stocks were about three million tons and that since that date her consumption has exceeded supplies.

ITALY'S domestic production, and that from ALBANIA is expected in 1942 to amount to 260,000 tons of crude oil, finished products 220,000 tons and ROUMANIA (where she has to compete with GERMANY for supplies and probably cannot count on much more than 50,000 tons a month). The Italian refineries are, therefore, very largely idle.

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2 SECTION III (3)

Petroleum supplies are eked out by home produced alcohol from sugar beet (9,000 tons a month) and methane (equivalent to about 4,000 tons a month). The use of producer gas is increasing, but no reliable information is available regarding the extent of its substitution for gasoline.

(c) *Electric Power.*—In view of the deficiency in liquid and solid fuels, the production of hydro-electric power is of the utmost importance to ITALY. Output has trebled in the last 15 years and is now about 15,000 million Kw.H. with an additional 570 million Kw.H. from thermo-electric plants. Further expansion is in process.

The distribution of power production in ITALY in January, 1938, was:—

	Million Kw.H.
Northern ITALY	10,700
Central ITALY	3,200
Southern ITALY	700
Italian Islands	350

About 50 stations have a capacity of over 20,000 Kws. each.

Over 70 per cent. of the hydro-electric plants use power derived from Alpine sources and 27 per cent. from the APPENNINES. In order to counteract the differences in the seasonal flow of water, a grid system has been erected involving some 95,000 kms. of power transmission lines.

It has been estimated that as much as 90 per cent. of the output of the Italian manufacturing industry depends on the uninterrupted flow of electric power. This estimate includes the use of electric power in transport, metallurgical furnaces, and in electrolysis, as well as for motive power for plant and machinery.

In SICILY power is generated by thermo and hydro power stations of approximately equal annual output. The dry season extends over three to five months, commencing May/June and during this period practically the whole of the load is carried by the three thermo power stations at CATANIA, PORTO EMPEDOCLE and PALERMO. The wet season enables the various hydro power stations to carry the load. These stations are numerous.

Details of Thermo and Hydro-Electric Power Stations are as follows:—

Name.	Type.	Capacity, Kw.	Remarks.
CATANIA	Thermo	28,500	Steam generated by four Babcock boilers; the largest generates 49 tons of steam per hour at a pressure of 370 lb. per sq. in. Pulverised coal is used as fuel.
PORTO EMPEDOCLE	Thermo	10,000	
PALERMO	Thermo	13,800	
GRAZIA VECCHIA	Hydro	11,000	Uses water from PIANA DEI GRECI Reservoir, at head of 1,550 ft. (Canal 9 miles long partly in tunnel). Head 360 ft.
ALCANTARA I (Francavilla)	Hydro	5,600	Head 327 ft.
ALCANTARA II (Kaggi)	Hydro	4,800	Head 495 ft.
CASSIBILE (Cavagrande)	Hydro	5,360	Possibly not completed.
SAN CARLO	Hydro	7,300	Possibly not completed.
POGGIO DIANA	Hydro	4,200	

The three main power stations at CATANIA, EMPEDOCLE and PALERMO are on the

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ALCANTARA II (Kaggi)	Hydro	4,800	Head 360 ft.
CASSIBILE (Cavagrande)	Hydro	5,350	Head 327 ft.
SAN CARLO	Hydro	7,300	Head 495 ft.
POGGIO DIANA	Hydro	4,200	Possibly not completed.

The three main power stations at CATANIA, EMPEDOCLE and PALERMO are on the Grid System. For this reason the power supply of SICILY cannot be paralysed except by the simultaneous destruction of all these three stations.

(ii) Mining and Metallurgy

(a) *Iron and Steel.*—ITALY is deficient in sources of iron. The principal deposits are in ELBA, SARDINIA and AOSTA which together produce about one million tons of ore annually. This, together with the deficiency of coal, explains why the Italian steel industry was originally designed to work mainly on scrap, of which annual imports amounted to about 600,000 tons. In anticipation of the cutting off of the supply (two thirds of which came from the U.S.A.) in the event of war, the Italian Government began a few years ago a re-organization of the industry, requiring the largest plants to turn over to production of steel from pig iron. At the same time, a number of electric furnaces were installed for the production of iron from sintered roasted pyrites.

Steel output apparently reached 2,350,000 tons in 1939 and that of iron and steel castings to about 200,000 tons. This involved the use of a million tons of home produced scrap, a figure which probably cannot be repeated.

SECTION III (3) 3

(b) *Non-ferrous metals*.—The only non-ferrous metals which ITALY has in any quantity are mercury, lead, zinc, aluminium and magnesium. Two of the three lead smelting works are in SARDINIA where some 80 or 90 per cent. of the lead ore is mined. The chief deposits of zinc are also in SARDINIA.

Mercury.—The annual output of mercury is at present, rather less than 2,000 tons. There is only the German market, which ITALY has to share with SPAIN.

Lead.—ITALY is not yet quite self-sufficient in lead but production is approaching 50,000 tons a year.

Zinc.—ITALY produces more zinc than she requires and is a substantial exporter of concentrates to GERMANY.

Aluminium.—Production of aluminium has nearly doubled in the last four years and now probably approximates 50,000 tons a year, which is sufficient for Italian needs. Bauxite production exceeds Italian needs and some 100,000 tons a year are available for GERMANY.

Magnesium.—Production of magnesium has increased four or five times in the last three years and in 1941 was probably about 4,500 tons, which leaves a small balance for export.

(c) *Other Minerals*

Sulphur.—ITALY produces over 300,000 tons of rock sulphur a year, mainly from SICILY.

Borax.—ITALY is a principal European producer of borax and has an export surplus.

(iii) *Engineering and Armaments*

(a) *Engineering*.—The Italians have accomplished many remarkable feats in civil engineering, but the capacity of the engineering industry is relatively small, although Fiat cars and Isotta-Fraschini engines are well-known.

(b) *Shipbuilding*.—Of the 33 more important yards in ITALY capable of building seagoing vessels, some 16 can undertake naval construction. The largest yards are at GENOA and TRIESTE. These 16 yards have slips which can accommodate :—

16 or 17 battleships or heavy cruisers,
31 light cruisers,
20-22 destroyers,
33 submarines,

and this, of course, is a theoretical maximum programme of simultaneous construction.

Some variation in this programme is, of course, possible, and it has been reported that as many as 50 submarines are at present under construction.

Limiting factors again are shortage of raw materials and of skilled labour. Since the outbreak of war GERMANY has acquired the largest shipbuilding concern (Ansaldo) and German "Experts" and "Technicians" have been reported in many yards. GERMANY is no doubt directing the shipbuilding programme.

(c) *Land Armaments*.—The Italian engineering industry has been organized for some years for rapid mobilization for war purposes, but there seems reason to suppose that the results have not been satisfactory. Although Breida, Fiat and Ansaldo manufacture fair quantities of guns, tanks and A.F.Vs., the output is inadequate for the army which ITALY can put in the field, and is again dependent on supplies of raw materials from GERMANY.

(d) *Aircraft*.—There is a plant capacity for production of at least 500 aircraft of military types a month, but it is believed that output fell in the early part of 1941 to about half of this figure. Some recovery has been made latterly, probably to some extent under German direction.

The output of instruments and other special equipment for aircraft is thought to be inadequate, but little information is available.

(iv) *Chemicals and Explosives*

(c) *Other Minerals*

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(iv) *Chemicals and Explosives*

Despite considerable plant capacity for the manufacture of explosives, ITALY has apparently, so far, depended largely on imports of high explosives from GERMANY. The industry is in any event dependent upon imports of toluol, but there is probably sufficient domestic cellulose for propellants.

ITALY has a well-developed synthetic chemical industry and has been able to maintain an export trade in dyestuffs and drugs. The plastics industry is comparatively small.

(v) *Textiles*

Production of rayon and staple fibre, together with hemp and flax, is probably sufficient as regards quantity for Italian needs, but as the Italian production of wool and cotton represents only a very small proportion of normal consumption, their substitution by artificial fibres has left much to be desired in the quality of the piece goods and clothing at present produced.

In spite of an increased production of arundo donax and other domestic sources of cellulose ITALY still requires 200,000 to 250,000 tons of wood pulp a year for textile purposes alone, in addition to pulp for paper manufacture.

4 SECTION III (3) and (4)

(vi) Rubber and other industries

(a) *Rubber*.—ITALY is at present almost entirely dependent on GERMANY for supplies of rubber. There are two factories under construction for the production of synthetic rubber and one of these with a capacity of 3,000 to 6,000 tons a year may shortly be in production.

(b) *Hides, skins and tanning materials*.—Average consumption is 60,000 to 70,000 tons a year, of which just over 50 per cent. is home produced. ITALY is having difficulty in maintaining sufficient supplies of heavy leather, even for essential requirements.

A serious shortage of sheep- and goat-skin leather is not, however, likely.

In view of the serious reduction in the quantity of hides and skins available for tanning, ITALY'S domestic output of tanning materials is probably sufficient.

(c) *Naval Stores*.—ITALY has no production of colophony or turpentine but has so far been able to import sufficient from SPAIN and PORTUGAL. She is suffering from a shortage of drying oils and of natural gums and resins.

(d) *Soap and glycerine*.—There is probably sufficient lower grade olive oil to maintain the small soap ration of 150 grammes per head per month.

Glycerine is produced from olive oil and more recently from molasses. This supply is probably sufficient for domestic requirements.

(4) Transportation and Mercantile Marine

Before the outbreak of the present war the Italian Mercantile Marine ranked sixth in the world with a gross tonnage of nearly 3½ millions.

The classification by tonnage in July, 1939, was as follows :—

	Number of Ships.	Aggregate gross tonnage.
Over 100 and under 1,000 tons	..	..
1,000 to 2,000 tons	544	179,134
2,000 to 4,000 tons	147	208,473
4,000 to 6,000 tons	159	463,795
6,000 to 8,000 tons	240	1,228,265
8,000 to 10,000 tons	79	519,840
Over 10,000 tons	28	243,366
	30	581,931
Totals	1,227	3,424,804

Of the above ships, 364 were motor vessels with a total of 715,784 gross tons. The remainder, some 863, with 2,709,020 gross tons, were steam driven.

As regards age, 252 steamers and motor vessels of 835,450 gross tons, aggregate 24½ per cent. of the total, were between 15 and 20 years old, and 204 steamers and motor vessels of 571,010 gross tons, aggregate 16½ per cent. of the total, were between 20 and 25 years old.

There were also no less than 565 ships, mainly old coasting steamers and trawlers, of 1,103,799 gross tons, which in the aggregate were over 25 years of age.

ITALY possessed a total of 84 oil tankers of 1,000 tons and upwards, totalling 426,002 gross tons; of these, 17 were motor ships of 110,350 gross tons. About half-a-dozen of these newest tankers had speeds of over 14 knots.

(d) Soap and glycerine.—There is probably sufficient lower grade olive oil to maintain the small soap ration of 150 grammes per head per month.

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Two-thirds of the above total tonnage is known to be sunk or otherwise immobilized.

Italian Coastal Trade

As a result, originally, of sanctions, and later of the scarcity of foreign exchange and the intense nationalism of the last five years, ITALY has built up an elaborate system of autarchy in which even the smallest items of merchandise or raw material become an important part of the whole. The failure of any one cog in this elaborate machinery would throw the whole system out.

This self-sufficiency programme has resulted in the coastal schooner trade becoming one of the main arteries of Italian industrial life. Coastal schooners carrying autarchic goods from small ports both on the mainland and the islands to industrial centres have endeavoured to replace as much as they can the merchant ships which used to bring imports from abroad. Such places as ONEGLIA, GIOIA TAURO, PORTO VENERE, FOLLONICA and SAVONA—to mention only a few—have become collectively even more important than the big ports such as GENOA, LEGHORN and NAPLES.

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The following is a list of the small ports mainly used by the coastal schooners:—

ITALY.

Imperia.	Albenga.	Noli.
Savona.	Genoa.	Sestri Levante.
Spezia.	Leghorn.	Vada.
Portoferraio.	Piombino.	Follonica.
San Stefano.	Civitavecchia.	Fiuminico.
Porto d'Anzio.	Gaeta.	Naples.
Castellamare.	Salerno.	Gioia.
Porto Empedocle.	Palermo.	
SARDINIA.	La Maddalena.	Tortoli.
	San Antioco.	Alghero.
	Argentiera.	Porto Torres.

Most accessible, and in many ways the most important, are the ones that lie between GENOA and the French Frontier, viz., SAVONA, ALBENGA, and IMPERIA, situated as they are on the main Italian railway. Other accessible ports are those on the Island of SARDINIA, viz., TERRANOVA, PORTO TORRES, SAN ANTIOCO and ALGHERO.

6 SECTION IV (1)

SECTION IV

GEOGRAPHY AND TOPOGRAPHY

(1) Brief Description of Country, and Location of Frontiers

The Kingdom of ITALY, with an area estimated at 119,743 square miles, has a population of 42,993,602 (Census, March, 1936).

MAINLAND and Adjacent Islands

The Mainland of Italy consists of a large Peninsula which projects from the mass of Central Europe far to the South into the MEDITERRANEAN Sea.

It is bounded on the North by the Republic of SWITZERLAND, and AUSTRIA, on the South by the MEDITERRANEAN, on the East by the ADRIATIC, and on the West by FRANCE and the LIGURIAN and TYRRHENIAN Seas.

The Western boundary (France/Italy) is at ST. LUIGI PT., near MENTONE, 43° 47' N., 7° 32' E. (Chart No. 3220.)

The Eastern boundary (Italy/Yugoslavia) is at the east end of the sea front at FIUME, 45° 19' N., 14° 27' E. (Chart No. 2711.)

To the North, where it joins the main continent of EUROPE, it is separated from the adjacent countries by the mighty barrier of the ALPS, which sweep round in a vast semi-circle from the head of the ADRIATIC, to the shores of NICE and MONACO. The land thus circumscribed extends between the parallels of 46° 40' and 36° 38' North and between 6° 30' and 18° 30' East. Its greatest length in a straight line along the mainland is from N.W. to S.E., in which direction it measures 708 miles from the frontier near COURMAYEUR to CAPE STA MARIA DI LEUCA, South of OTRANTO, but the great mountain Peninsula of CALABRIA extends about 2° farther South to CAPE SPARTIVENTO in latitude 37° 55'. Its breadth, owing to its configuration, is very irregular. The Northern portion, measured from the ALPS at the MONTE VISO to the mouth of the PO, has a breadth of about 270 miles, while the maximum breadth from the MONT CENIS to FIUME, is far greater. The Peninsula of ITALY, which forms the largest portion of the country, nowhere exceeds 150 miles in breadth and does not generally measure more than 100 miles across.

The configuration and internal geography of ITALY are determined almost entirely by the great chain of the APENNINES, which branches off from the MARITIME Alps between NICE and GENOA, and, after stretching in an unbroken line from the GULF of GENOA to the ADRIATIC, turns more to the South, and is continued throughout Central and Southern ITALY, of which it forms as it were the backbone, until it ends in the Southernmost extremity of CALABRIA at CAPE SPARTIVENTO.

ITALY possesses close to her own coast the Islands of SICILY and SARDINIA, the TOSCANO Archipelago (ELBA and other small Islands), the LIPARI Archipelago (STROMBOLI and other small Islands), some Islands (CAPRI, ISCHIA, etc.) off the West coast, and USTICA off SICILY. In the MEDITERRANEAN are the three Islands of PANTELLERIA, LINOSA and LAMPEDUSA; and in the ADRIATIC, LAGOSTA, CAZZA, LUSSIN, CHERSO and some smaller Islands. SASENO Island, off VALONA Bay, is Italian, as also is ZARA, a small enclave in YUGOSLAVIA—Lat. 44° 7' N., Long. 15° 14' E. The territory of ZARA under Italian sovereignty includes the City and the administration communes of ZARA, BORGO ERIZZO, ARNO, BOCCAGNAZZO and part of that of DICLO.

THE DODECANESE ISLANDS

Overseas possessions include the DODECANESE Group of some 40 Islands situated off

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THE DODECANESE ISLANDS

Overseas possessions include the DODECANESE Group of some 40 Islands situated off the South-West coast of TURKEY. The principal of these are as follows:—

RHODES (RODI), Lat. 36° 13' N., Long. 28° E.
LERO (LEROS), Lat. 37° 10' N., Long. 26° 51' E.
STAMPALIA (ASTRAPALIA), Lat. 36° 30' N., Long. 26° 23' E.
SCARPANTO (KARPATOS), Lat. 35° 31' N., Long. 27° 14' E.
KOS (COO), Lat. 36° 54' N., Long. 27° 19' E.
PATMOS (PATMO), Lat. 37° 18' N., Long. 26° 34' E.
KALIMNO (CALINO or KALYMNOS), Lat. 36° 57' N., Long. 27° 01' E.
SYMI (SIMI), Lat. 36° 31' N., Long. 27° 52' E.
KHALKIA (CALKI, KHARKI or HALKI), Lat. 36° 13' N., Long. 27° 39' E.
KASO (CASOS or CASO), Lat. 35° 25' N., Long. 26° 56' E.
LIPSO (LIPSOS or LISSO), Lat. 37° 20' N., Long. 26° 45' E.
PISKIPI (PISCOPI or TILOS), Lat. 36° 25' N., Long. 27° 23' E.
NISERO (NYSEROS or MYSEROS), Lat. 36° 33' N., Long. 27° 11' E.
KASTELORIZO (CASTELLORIZIO or CASTEL ROSSO), Lat. 36° 08' N., Long. 29° 38' E.

SECTION IV (1) and (2) 7

RHODES

RHODES Island is about 49 miles north-east to south-west, and 20 miles broad (C. MONOLITHOS-C. FOCA); it narrows to a point at the north and the south end. It consists of a massive core of hard rocks, heavily overlaid with softer marls and sandstones, into which the streams have cut deeply, carrying much silt on to coast plains and beaches. Consequently it has few promontories or deep bays; only around LINDOS is the landscape typically Mediterranean. The harbour of RHODES CITY is wholly artificial.

Mountains

The watershed range rises gently from the north end to its greatest heights, Mt. ELIAS (2,620 ft.), ATTAYARO (4,068 ft.) and AKRAMYTIS (2,706 ft.).

These highlands furnish abundant rainfall, considerable streams—a few perennial—and much forest, especially on the western (windward) slopes. Elsewhere on the harder rocks there is scrub and rough pasture for sheep. The softer marls and sandstones are extensively terraced for grain crops, cotton, tobacco, olives, vines and fruit trees: in the moist valley bottom there is cattle pasture.

LERO

LERO Island lies north of KALIMNO, from which it is separated by a narrow strait closed by two islands; only the northern channel is navigable. Much of the coast, even in the central region, is cliff or rock.

The three main masses of higher ground are connected by low necks about a mile wide.

The northern and southern regions are mountainous, of hard grey limestone, rugged and even precipitous, almost without soil or surface cover, except in ravines and cove-heads.

The Central Region lies lower, and its core of hard rocks is mostly covered with softer and porous marls, which are cultivatable. The main watershed runs north-east to south-west, from the Castle Hill overlooking ALINDA and PANALE Bays, to PATELLA Hill north of the entrance to Port LAKI. Facing the Castle Hill, and separated from it by the hollow containing LERO town, is MERAIGLIE ("Day-Watchman") Hill (600 ft.), whence the ground slopes gently to the GOURNIA ("Pig Pasture") district round THREMONA Bay, and this low ground at the head of Port LAKI; these districts are marshy in winter. All this Central Region has natural scrub covering, with many walled fields and stone homesteads.

ALBANIA

The Northern massif of ALBANIA is peopled by Catholic tribes, whose organisation resembles the ancient Scottish Clans. They are poor, ignorant, brave, quarrelsome and proud. The centre is chiefly Moslem, better educated and somewhat richer. The South is mostly Orthodox with occasional Moslem patches. The Southern Orthodox is the most advanced element in the population, but unwarlike and politically insignificant. The Turkish system of dividing the population according to religion has left its imprint on the country, and the ruling clique is predominantly Mohammedan, i.e., Turkish, but there is little in the way of religious fanaticism.

The Frontier with YUGOSLAVIA at the coast is at the mouth of the BOYANA River in Lat. 41° 52' 20" N., Long. 19° 22' 45" E. The Island at the mouth of the River is YUGOSLAV Territory. From the coast, the frontier follows the River to Lat. 42° 1' 20" N., Long. 19° 24' 45" E., whence it runs approximately north to Lake SCUTARI. Crossing the Lake, it follows the Eastern shore of Lake HOTII to its head, and then runs approximately north-east. The Albanian coast is generally high and steep too, with the exception of that part which lies between CAPE LINGUETTA and the Gulf of DRIN which is low and sandy.

Lake SCUTARI and the BOYANA River are closed to warships, though, in any event, only very shallow draught vessels could enter the channel of the BOYANA River, which is the only outlet to the sea. By a Treaty between YUGOSLAVIA and ALBANIA, each country

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The Frontier with GREECE meets the sea at Cape STILO and runs inland, approximately eastward, for about 10 miles before turning northward around the head of the rivers which feed Lake BUTRINTO.

(2) Climatic Conditions as affecting Naval Operations

Note.—No attempt is made to deal with the aspect of health as affected by climatic conditions.

ITALY—Mainland

There are no characteristic prevailing winds. Winter winds on the west coast are, perhaps, mainly northerly. In the ADRIATIC, north-east has a slight prevalence at the inner end: north-east wind is known as BORA. It is a cold wind and often blows hard, particularly in the north-western part of the ADRIATIC. Elsewhere winds are mostly south-east or north-west. Summer winds are a little more often between south and west in the north, and between north-west and west in the central and southern parts of West ITALY. In the ADRIATIC there is a higher frequency of north-west and south-east winds. During the months December

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to March there are, on the average, three days per month of winds of force 7 or more. During remaining months strong winds or gales are rare. South-easterly winds are known as SCIROCCO. They are damp and depressing and are often accompanied by haze or mist depending as they are nearer to or farther from the African shore. In the upper half of the ADRIATIC in particular, they raise a big sea due to the additional fetch and are the cause of thick mist or fog which is occasionally experienced at all seasons, though chiefly in spring. Land and sea breezes are marked, except in winter (fresh onshore winds during the hotter part of the day, and calm nights and early morning).

Upper winds are variable up to 6,000 ft., becoming north-westerly thereafter. Winds of as much as 40 knots are rare, and those of between 28 and 40 knots occur about five times a month at 10,000 ft. during winter. When a BORA is blowing, the force of the wind is usually appreciably less at about 700 ft. At higher levels it may be much stronger or it may be weaker, depending on the type.

Visibility at sea is usually good, though mist (sometimes thick) occurs in summer and late spring with the SCIROCCO. Fog or thick mist forms over the land, particularly during autumn and winter, and in the ADRIATIC chiefly when light south-easterly winds are blowing. This latter type is confined to within a few miles of the coast and usually clears by 1000.

Rain is plentiful, except during June, July and August, and occurs in appreciable quantity on about eight days a month from October to April, and five days in May and September.

Cloud averages about five-tenths near the coast between October and May, and from two- to three-tenths in the other months. Skies overcast with low cloud occur on about 40 per cent. of days in winter and 10 per cent. in summer, with intermediate values in remaining months. In the ADRIATIC the neighbourhood of ANCONA would seem to have rather higher figures and the Gulf of VENICE lower.

Temperatures average from 42° in the north to 53° in the south during the winter, and from 70° to 80° in the summer. Summer heat is trying, particularly during the middle of the day and when the wind is between south and east.

The weather is so variable, except perhaps in the summer, that forecasting from synoptic charts should be invariably practised.

(3) Transport Facilities, including Waterways, Railways, Roads, and their Vulnerable Points

(A) INLAND WATERWAYS

ITALY

Lacking connection with the main inland waterways of Europe, ITALY'S rivers and canals are of little value for international trade, though some external local trade crosses the border lakes.

There are 1,300 miles of navigable waterways, of which 1,050 are in Northern ITALY. As they run chiefly east and west they are of little service to the important north and south traffic. In 1935 (the latest returns available) the total tonnage carried was under 2½ million tons, of which 71 per cent. was for internal trade, mainly constructional material.

The most important routes are the following:—

PO	..	..	..	Navigable for boats of 180 tons for 87 miles and further for barges.
ADIGE	..	..	..	Navigable for boats of 100 tons for 87 miles and further for barges.
BACCHIGLIONE	..	..	..	Navigable to VICENZA for barges.
BRENTA	..	..	..	Navigable to the level of VICENZA for barges.
SILE	..	..	..	Navigable to TREVISO for barges.
TIBER	..	..	..	Navigable to ROME for small steamships and barges.

There is boat transport across Lakes ORTA, MAGGIORE, COMO, ISEO and GARDA.

blowing. This latter type is confined to within a few miles of the coast and usually clears by 1000.

Rain is plentiful, except during June, July and August, and occurs in appreciable quantity on about eight days a month from October to April, and five days in May and September.

Cloud averages about five-tenths near the coast between October and May, and from two- to three-tenths in the other months. Skies overcast with low cloud occur on about 40 per cent. of days in winter and 10 per cent. in summer, with intermediate values in remaining months. In the ADRIATIC the neighbourhood of ANCONA would seem to have rather higher figures and the Gulf of VENICE lower.

Temperatures average from 42° in the north to 53° in the south during the winter, and from 70° to 80° in the summer. Summer heat is trying, particularly during the middle of the day and when the wind is between south and east.

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There is boat transport across Lakes ORTA, MAGGIORE, COMO, ISEO and GARDA.

ALBANIA

With the exception of the DRIN, which is navigable for small tugs and boats for a short distance, and the BOYANA, by which small ships can enter Lake SCUTARI the rivers of ALBANIA can only be used for floating timber or developing power. Any attempt to control Albanian rivers would entail canalisation, involving heavy cost.

(B) RAILWAYS

The Italian State Railways, which are administered from ROME, classify all lines as follows:—

Class I.	Main lines of primary importance always laid with new rails of heavy type.
Class II.	Lines of medium importance laid with new, or good used, rails.
Class III.	Lines of minor importance usually laid with used rails from Class II lines or rails of lighter type.
Class IV.	Narrow-gauge lines laid with used rails from Class III lines or lines of lighter type.

Personnel

The operating and technical personnel are well trained, and the administrative staff maintains a good standard of efficiency.

SECTION IV (3) 9

Internal railway communications between industrial centres and ports are adequate in peacetime. According to the Annual Report of the State Railways for 1936-7, there were 11,800 miles of standard gauge track on 30th June, 1937, of which 2,700 miles were double or four-track line. Of the total, 2,480 miles had been electrified and 710 miles were in process of electrification.

On 30th June of the last few years, rolling stock consisted of:—

	1935.	1936.	1937.
Locomotives ..	..	..	..
Of which, electric railcars ..	..	..	..
Coaches ..	..	..	..
Trucks ..	..	..	..
	6,042	6,208	6,244
	—	1,177	1,278
	—	180	297
	6,569	7,126	6,970
	122,023	127,410	126,968

There were under construction on 30th June, 1937:—

- 125 electric locomotives.
- 79 electric railcars.
- 241 other railcars.
- 8 articulated electric trains.
- 9 motor-driven trains.

Locomotives under repair averaged 10 per cent.

In 1938 (no later figures are available), the rolling stock on the Italian Railways consisted of:—

- 53,400 high-sided open waggons.
- 14,600 flat or low-sided waggons.
- 52,000 covered waggons.
- 5,000 specials—tank waggons, etc.

It is estimated that the maximum consumption of coal now in a year of high activity would not exceed 2½ million tons.

The maximum weight of Italian imports carried by rail on each of the routes specified in any one post-war year (not the same year in each case) has been:—

	Tons.	Percentage of total.
Through SWITZERLAND ..	..	34.4
via DOMODOSSOLA ..	995,000	
via LUINO ..	342,000	
via CHIASSO ..	2,001,000	
Through YUGOSLAVIA ..	..	26.0
via PIEDICOLLE ..	376,000	
via POSTUMIA ..	1,839,000	
via FIUME ..	311,000	
Through GERMANY ..	..	28.9
via BRENNERO ..	953,000	
via S. CANDIDO ..	309,000	
via TARVISIO ..	1,543,000	
	3,338,000	

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<i>Through GERMANY</i>		28.9
via BRENNERO ..	953,000	
via S. CANDIDO ..	309,000	
via TARVISIO ..	1,543,000	
<i>Through FRANGE</i>		10.7
via VENTIMIGLIA ..	253,000	
via MODANE ..	788,000	
via BREIL ..	4,000	
Total ..	9,714,000	100.0

It is estimated that Italian railways operating a shuttle service between the frontiers and northern marshalling yards could carry the total weight of ITALY'S foreign trade in both directions, but this would demand that all frontiers be open and that the railway schedules of limitrophe states be drastically altered in ITALY'S favour. At the same time it would require the most precise working of Italian marshalling yards and railway schedules, which in turn would be largely dependent upon the timely handling of rolling stock by consignees. Moreover, the carrying of supplies for an Army operating on the northern frontiers would complicate the position.

10 SECTION IV (3)

ALBANIA

There are no normal gauge railways in ALBANIA, although a project to connect TIRANA with DURAZZO was begun, but abandoned owing to lack of funds. A few lengths of light track exist in connection with the petroleum and bitumen works, while considerable lengths of war-time Austrian decauville still exist on the DURAZZO-TIRANA and DURAZZO-SCUTARI roads. Many schemes have been propounded for railway construction, but lack of finance has always proved an obstacle. A line to the East from DURAZZO would establish railway communication between the ADRIATIC and the AEGEAN, and would be of considerable economic and strategic value to ITALY.

(C) ROADS

(i) MAINLAND

There are some 12,000 miles of State roads and about 300 miles of special motor roads. The military roads of VENETIA have been modernised and over 300 miles of new roads added. The quality of the internal road communications is high, but the topography of the country forces the division of north-south roads into two main arteries, one following the western and one the eastern coastline.

There are 16 motor roads, as under, crossing the Italian frontiers:—

From SWITZERLAND	..	..	..	6
From AUSTRIA	..	..	..	5
From FRANCE	..	..	..	4
From YUGOSLAVIA	..	..	..	1

Only five are suitable for continuous two-way lorry traffic, namely:—

From:	Crossing at:	Leading to:
FRANCE.	VENTIMIGLIA.	GENOA.
FRANCE.	MODANE.	TURIN.
SWITZERLAND.	SIMPLON.	DOMODOSSOLA.
AUSTRIA.	BRENNER PASS.	BOLZANO.
YUGOSLAVIA.	PLANINA.	TRIESTE.

A considerable length of four of these roads is, however, under snow in winter and, in any case, could not materially relieve the railways in emergency.

The numbers of motor vehicles of various types registered in Italy up to 1937 were as follows:—

31st Dec.	Private motor cars.	Motor buses.	Lorries.	Trailers.	Tractors (agricultural).	Motor cycles.
1930	201,919	8,750	63,993	10,665	10,398	89,146
1935	282,135	9,555	105,082	18,095	16,217	149,314
1936	295,055	9,764	106,219	17,000	16,680	158,664
1937	318,388	9,644	108,348	15,615	17,452	178,645

(ii) ALBANIA

ALBANIA has a fairly extensive system of main roads which, although for the most part roughly surfaced, are usable for motor-traffic, except in abnormally severe weather conditions. The communication between SCUTARI and the Ports of DURAZZO.

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(ii) ALBANIA

ALBANIA has a fairly extensive system of main roads which, although for the most part roughly surfaced, are usable for motor-traffic, except in abnormally severe weather conditions. These roads provide direct communication between SCUTARI and the Ports of DURAZZO, VALONA and SANTA QUARANTA, with extensions to the more important internal centres, like TIRANA, ELBASAN, and BERAT, but the communications farther East are less satisfactory. One important administrative centre, KUKES, in the North-East, is still cut off from the main Albanian system and the approaches to KORTCHA are circuitous. Communication with YUGOSLAVIA is assured by two roads from SCUTARI; one from KUKES to PRIZREND; one from ELBASAN to OCHRIDA via STRUGA; and one from KORTCHA passing West of Lake PRESBA. Roads from VALONA and SANTA QUARANTA cross the Greek frontier at two points, to converge later on JANINA, the most important being that via ARGYROCASTRO. Two further roads lead from KORTCHA into GREECE, one to the railroad at FLORINA, another via LESKOVIK to the Southern frontier where it joins one of the roads from VALONA to JANINA. The estimated length of main roads is already not far short of 1,250 statute miles.

No official estimate of the number of motor vehicles is available, but the number may be put conjecturally at about 1,000. Lorries are largely used for internal transport and there are numerous private bus services between main centres, but no urban services.

SECTION IV (3) 11

Vulnerable Points on Railways and Roads

(I) ITALY—MAINLAND

(See Plans I and S7.)

AREA "A"—FRANCO-ITALIAN FRONTIER TO GULF OF GENOA
(Inclusive)

AREA "A"—SECTION I

CAPE MORTOLA TO CAPE NOLI

The railway bridges mentioned in the text are all on the main line from the French Riviera and VENTIMIGLIA to GENOA, and the road bridges are all on the main road between the same places.

There are, except for extremely difficult and circuitous routes, no alternative roads or railways.

The railway, which is electrified (3-phase system, 4,000 volts, 16.7 periods) from VENTIMIGLIA to GENOA was at the commencement of 1940 being doubled, but the only double-track sections appear to be between VENTIMIGLIA and BORDIGHERA and ALBENGA and LOANO.

The first bridge mentioned under each heading is nearest the coast, and the exact position given and distance from coast (unless otherwise stated) is that of the railway bridge. When no distance is given the railway bridge is on the coast.

Vulnerable Points:—

C. MORTOLA

- (a) W.N.W. 2.2 Km., road bridge (unimportant), railway bridge (masonry, single span, 30 metres long and 12 metres high) and road bridge over gorge at frontier 100 metres from coast. Lat. $43^{\circ} 47' 5''$ N.; Long. $7^{\circ} 31' 45''$ E.
- (b) W.N.W. 1.8 Km., viaduct (masonry, 10 arches; span of each arch, 6 metres, of which five are built up against the red cliff). Lat. $43^{\circ} 47' 0''$ N.; Long. $7^{\circ} 32' 5''$ E.
- (c) W.N.W. 1.3 Km., viaduct (masonry, four arches, about 50 metres long). 70 metres from coast. Lat. $43^{\circ} 47' 0''$ N.; Long. $7^{\circ} 32' 30''$ E. Landing—small beach at foot of viaduct.
- (d) N.N.E. 0.6 Km., viaduct (11 arches; each span 6 metres; height 10 metres). 60 metres from coast. Lat. $43^{\circ} 47' 5''$ N.; Long. $7^{\circ} 33' 15''$ E.
- (e) N.E. 1.5 Km., railway bridge over R. LATTE (two arches, 6-8 metres each span, 15 metres long and 10 metres high). 250 metres from river mouth. Lat. $43^{\circ} 47' 25''$ N.; Long. $7^{\circ} 33' 55''$ E. Landing—beach at river mouth.

BORDIGHERA Church

- (a) W.N.W. 6 Km., foot bridge (200 metres from river mouth), road bridge (masonry 110 metres long; five spans; 8 metres high; 600 metres from river mouth) and railway bridge (masonry, 140 metres long, seven arches, and 9 metres high; three lines; 900 metres from river mouth) over R. ROIA. Lat. $43^{\circ} 47' 48''$ N.; Long. $7^{\circ} 36' 10''$ E. Landing—beach at river mouth.
- (b) W.N.W. 3.9 Km., railway bridge (masonry, four spans, 40 metres long) and road bridge (stone, two spans), adjoining, over NERVIA, 600 metres from beach at mouth of river. Landmark: locomotive shed and electric sub-station west of river mouth. Lat. $43^{\circ} 47' 20''$ N.; Long. $7^{\circ} 37' 45''$ E.
- (c) W.N.W. 2.8 Km., railway bridge (14 metres long and 6 metres high) and road bridge (400 metres distant from river mouth) over R. VALTECCHIO. Lat. $43^{\circ} 47' 25''$ N.; Long. $7^{\circ} 38' 15''$ E.

The railway, which is electrified (3-phase system, 4,000 volts, 16-7 periods) from VENTIMIGLIA to GENOA was at the commencement of 1940 being doubled, but the only double-track sections appear to be between VENTIMIGLIA and BORDIGHERA and ALBENGA and LOANO.

The first bridge mentioned under each heading is nearest the coast, and the exact position given and distance from coast (unless otherwise stated) is that of the railway bridge. When no distance is given the railway bridge is on the coast.

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- (b) W.N.W. 1.8 Km., viaduct (masonry, 10 arches; span of each arch, 6 metres, of which five are built up against the red cliff). Lat. $43^{\circ} 47' 0''$ N.; Long. $7^{\circ} 32' 5''$ E.
- (c) W.N.W. 1.3 Km., viaduct (masonry, four arches, about 50 metres long). 70 metres from coast. Lat. $43^{\circ} 47' 0''$ N.; Long. $7^{\circ} 32' 30''$ E. Landing—small beach at foot of viaduct.
- (d) N.N.E. 0.6 Km., viaduct (11 arches; each span 6 metres; height 10 metres). 60 metres from coast. Lat. $43^{\circ} 47' 5''$ N.; Long. $7^{\circ} 33' 15''$ E.
- (e) N.E. 1.5 Km., railway bridge over R. LATTE (two arches, 6-8 metres each span, 15 metres long and 10 metres high). 250 metres from river mouth. Lat. $43^{\circ} 47' 25''$ N.; Long. $7^{\circ} 33' 55''$ E. Landing—beach at river mouth.

BORDIGHERA Church

- (a) W.N.W. 6 Km., foot bridge (200 metres from river mouth), road bridge (masonry 110 metres long; five spans; 8 metres high; 600 metres from river mouth) and railway bridge (masonry, 140 metres long, seven arches, and 9 metres high; three lines; 900 metres from river mouth) over R. ROIA. Lat. $43^{\circ} 47' 48''$ N.; Long. $7^{\circ} 36' 10''$ E. Landing—beach at river mouth.
- (b) W.N.W. 3.9 Km., railway bridge (masonry, four spans, 40 metres long) and road bridge (stone, two spans), adjoining, over NERVIA, 600 metres from beach at mouth of river. Landmark: locomotive shed and electric sub-station west of river mouth. Lat. $43^{\circ} 47' 20''$ N.; Long. $7^{\circ} 37' 45''$ E.
- (c) W.N.W. 2.8 Km., railway bridge (14 metres long and 6 metres high) and road bridge (400 metres distant from river mouth) over R. VALLECROSA. Lat. $43^{\circ} 46' 58''$ N.; Long. $7^{\circ} 38' 25''$ E.

C. VERDE

- (a) N.E. 0.7 Km., railway bridge (masonry single span, 30 metres long and 6 metres high) and road bridge adjoining over the mouth of R. ARMEA. Lat. $43^{\circ} 49' 12''$ N.; Long. $7^{\circ} 50' 15''$ E.
- (b) N.E. 3.1 Km., railway bridge (masonry 30 metres long) and road bridge (stone, 30 metres long, and 600 metres from river mouth) over Fiumara TAGGIA. 300 metres from river mouth. Lat. $43^{\circ} 50' 0''$ N.; Long. $7^{\circ} 51' 35''$ E. Landing—beach at river mouth.

SAN LORENZO AL MARE (Church)

- W. 100 metres, railway bridge (masonry 35 metres long and 6 metres high) and road bridge adjoining. 100 metres from coast. Lat. $43^{\circ} 51' 10''$ N.; Long. $7^{\circ} 57' 55''$ E. Landmark—white church.

12° SECTION IV (3)

PORTO MAURIZIO (Southern Pier Harbour Light (red))

- (a) S.W. 2.4 Km., railway bridge (masonry, three spans of 12.5 metres, 6 metres high) and road bridge (stone, four spans, 7 metres high) adjoining, over Torrent PRINO. Lat. $43^{\circ} 52' 4''$ N.; Long. $7^{\circ} 59' 55''$ E.
- (b) W.S.W. 1.4 Km., two road bridges and railway bridge (span 10 metres) over R. CARMAGIA. 300 metres from coast. Lat. $43^{\circ} 52' 25''$ N.; Long. $8^{\circ} 0' 35''$ E.
- (c) N.W. 1.9 Km. (in IMPERIA), industrial railway bridge, road bridge (four piers, 100 metres long, 10 metres high) and railway bridge (reinforced concrete, 80 metres long; 7 metres high; double track) adjoining, over Torrent IMPERO. 550 metres from river mouth. Lat. $43^{\circ} 53' 25''$ N.; Long. $8^{\circ} 2' 5''$ E.

CAPO MELE Lighthouse

- (a) S.W. 6.35 Km., road bridge (reinforced concrete and five pillars) and railway bridge adjoining over Torrent CERVO. 250 metres from river mouth. Lat. $43^{\circ} 55' 20''$ N.; Long. $8^{\circ} 6' 25''$ E. Landing—at river mouth.
- (b) S.W. 5.8 Km., viaduct (six arches) adjoining beach. Lat. $43^{\circ} 55' 25''$ N.; Long. $8^{\circ} 6' 50''$ E. Landing—on beach.
- (c) W.N.W. 2.5 Km., road bridge (masonry over river mouth) and railway bridge (masonry, three spans of 14 metres) over Torrent MERULA. 1.5 Km. from river mouth. Lat. $43^{\circ} 57' 40''$ N.; Long. $8^{\circ} 8' 30''$ E.

ISOLA GALLINARIA (tower)

N.N.W. 2.2 Km., railway bridge (110 metres long; three spans; masonry piers) and road bridge (500 metres from railway; 90 metres long; three spans; masonry piers) over R. CENTA. 600 metres from river mouth. Lat. $44^{\circ} 2' 37''$ N.; Long. $8^{\circ} 13' 10''$ E. Landing—on beach at river mouth.

Between the mouth of the CENTA and CERIALE viaduct there are 15 small iron bridges over stream.

LOANO Station

- (a) S.W. 3.5 Km., viaduct (52 arches), but following doubling of track may have been replaced by an embankment. Lat. $44^{\circ} 5' 40''$ N.; Long. $8^{\circ} 13' 50''$ E. 150 metres from beach.
- (b) S.W. 1.3 Km., railway bridge and road bridge adjoining over Torrent VARATELLO 50 metres from coast. Lat. $44^{\circ} 6' 40''$ N.; Long. $8^{\circ} 14' 40''$ E.
- (c) N.E. 4.15 Km., road bridge (iron girder, 150 metres from river mouth) and railway bridge (masonry, three-span) over Torrent MARTIEMOLA and two roads. 250 metres from river mouth. Lat. $44^{\circ} 9' 3''$ N.; Long. $8^{\circ} 17' 10''$ E.

CAPO DI CAPRAZOPPA

- (a) N.N.E. 0.6 Km., road bridge (iron girder, 45 Km. long, 4 metres high) and railway bridge (four lines) over Torrent PORRA. 300 metres from river mouth. Lat. $44^{\circ} 10' 0''$ N.; Long. $8^{\circ} 20' 15''$ E., Landmark—factories.
- (b) N.E. 1.8 Km., road bridge (new, reinforced concrete, four spans; 30 metres long; height 4 metres) and railway bridge (masonry, two spans), over LA FIUMARA. 150 metres from beach. Lat. $44^{\circ} 10' 20''$ N.; Long. $8^{\circ} 21' 20''$ E. Landing—on sandy beach at mouth.

- (b) S.W. 3.8 Km., viaduct (six arches) adjoining beach. Lat. $43^{\circ} 55' 25''$ N.; Long. $8^{\circ} 6' 50''$ E. Landing—on beach.
- (c) W.N.W. 2.5 Km., road bridge (masonry over river mouth) and railway bridge (masonry, three spans of 14 metres) over Torrent MERULA. 1.5 Km. from river mouth. Lat. $43^{\circ} 57' 40''$ N.; Long. $8^{\circ} 8' 30''$ E.

ISOLA GALLINARIA (lower)

N.N.W. 2.2 Km., railway bridge (110 metres long; three spans; masonry piers) and road bridge (500 metres from railway; 90 metres long; three spans; masonry piers) over R. CENTA. 600 metres from river mouth. Lat. $44^{\circ} 2' 37''$ N.; Long. $8^{\circ} 13' 10''$ E. Landing—on beach at river mouth.

Between the mouth of the CENTA and CERIALE viaduct there are 15 small iron bridges over stream.

LOANO Station

- (a) S.W. 3.5 Km., viaduct (52 arches), but following doubling of track may have been replaced by an embankment. Lat. $44^{\circ} 5' 40''$ N.; Long. $8^{\circ} 13' 50''$ E. 150 metres from beach.
- (b) S.W. 1.3 Km., railway bridge and road bridge adjoining over Torrent VARATELLO 50 metres from coast. Lat. $44^{\circ} 6' 40''$ N.; Long. $8^{\circ} 14' 40''$ E.
- (c) N.E. 4.15 Km., road bridge (iron girder, 150 metres from river mouth) and railway bridge (masonry, three-span) over Torrent MARTIEMOLA and two roads. 250 metres from river mouth. Lat. $44^{\circ} 9' 3''$ N.; Long. $8^{\circ} 17' 10''$ E.

CAPO DI CAPRAZOPPA

- (a) N.N.E. 0.6 Km., road bridge (iron girder, 45 Km. long, 4 metres high) and railway bridge (four lines) over Torrent PORRA. 300 metres from river mouth. Lat. $44^{\circ} 10' 0''$ N.; Long. $8^{\circ} 20' 15''$ E., Landmark—factories.
- (b) N.E. 1.8 Km., road bridge (new, reinforced concrete, four spans; 30 metres long; height 4 metres) and railway bridge (masonry, two spans), over LA FIUMARA. 150 metres from beach. Lat. $44^{\circ} 10' 20''$ N.; Long. $8^{\circ} 21' 20''$ E. Landing—on sandy beach at mouth.

SECTION IV (3) 13

AREA "A"—SECTIONS II, III and IV

C. NOLI TO GULF OF SPEZIA

Details of the railways are as follows:—

The main railway line following the coast in the above area comprises three principal parts:—

- (a) CAPE NOLI to SAVONA: this forms part of the main line from the French Riviera coast (Menton) to SAVONA and GENOA.
- (b) SAVONA to GENOA: this forms the eastern continuation of section (a) above, as well as part of one of the two main lines from TURIN to GENOA.
- (c) GENOA to SESTRI LEVANTE: this forms part of the main line from GENOA to ROME. This route is additionally important as forming part of one of the two alternative main routes from both TURIN and MILAN to ROME.

Portions of the coastal railway throughout the region described below have, during recent years, undergone considerable reconstruction including the realignment and doubling of certain sections of the track and electrification. The track from CAPE NOLI to SAVONA is single throughout, and that between SAVONA and GENOA is double between PEGLI and GENOA. Between GENOA and SESTRI LEVANTE the track is double.

Electrification is according to the three-phase system, 4,000 volts, 16.7 periods.

Interruption to traffic between GENOA and SESTRI LEVANTE would prove the most serious to the operation of the Italian railway system. Furthermore, this section is the most vulnerable to attack from the coast.

In the text the first bridge to be mentioned under each heading is nearest the coast, and the exact position is that of the railway bridge.

AREA "A"—SECTION II

CAPE NOLI TO GENOA

Vulnerable Points:—

CAPE NOLI. N.

N. 3.2 Km. road bridge, and railway bridge (single span steel bridge, 80 ft. long). 0.3 Km. from coast. $44^{\circ} 13' 30''$ N.: $8^{\circ} 24' 48''$ E. Landing place—sandy coast on the north side of the Cape.

CAPE DI VADO

(a) N.W. 1.7 Km. road bridge (100 ft. long) in front of masonry railway bridge (90 ft. long, three spans of 21 ft. each) over River SEGNO. 0.3 Km. from coast $44^{\circ} 16' 10''$ N.: $8^{\circ} 26' 8''$ E.

(b) N.N.W. 2.6 Km. road bridge, railway bridge (steel and masonry) and road bridge, over QUILANO Torrent. 0.2 Km. from coast. $44^{\circ} 16' 55''$ N.: $8^{\circ} 26' 28''$ E. Landing places—near the mouths of the rivers.

years, undergone considerable reconstruction including the realignment and doubling of certain sections of the track and electrification. The track from CAPE NOLI to SAVONA is single throughout, and that between SAVONA and GENOA is double between PEGLI and GENOA. Between GENOA and SESTRI LEVANTE the track is double.

Electrification is according to the three-phase system, 4,000 volts, 16.7 periods.

Interruption to traffic between GENOA and SESTRI LEVANTE would prove the most serious to the operation of the Italian railway system. Furthermore, this section is the most vulnerable to attack from the coast.

In the text the first bridge to be mentioned under each heading is nearest the coast, and the exact position is that of the railway bridge.

AREA "A"—SECTION II

CAPE NOLI TO GENOA

Vulnerable Points:—

CAPE NOLI. N.

N. 3.2 Km. road bridge, and railway bridge (single span steel bridge, 80 ft. long). 0.3 Km. from coast. $44^{\circ} 13' 30''$ N.: $8^{\circ} 24' 48''$ E. Landing place—sandy coast on the north side of the Cape.

CAPE DI VADO

(a) N.W. 1.7 Km. road bridge (100 ft. long) in front of masonry railway bridge (90 ft. long, three spans of 21 ft. each) over River SEGNO. 0.3 Km. from coast $44^{\circ} 16' 10''$ N.: $8^{\circ} 26' 8''$ E.

(b) N.N.W. 2.6 Km. road bridge, railway bridge (steel and masonry) and road bridge, over QUILANO Torrent. 0.2 Km. from coast. $44^{\circ} 16' 55''$ N.: $8^{\circ} 26' 28''$ E. Landing places—near the mouths of the rivers.

SAVONA (mouth of river)

(a) N. 0.25 Km. road bridge and masonry railway bridge over LETIMBRO Torrent (three arches of 32 ft. each, height above river bed 21 ft.). 0.2 Km. from mouth of river. Landmark—two chimneys (the further away is of fluted masonry) 220 ft. high, and the nearer is of black metal, 115 ft. high. $44^{\circ} 18' 8''$ N.: $8^{\circ} 28' 32''$ E.

(b) N.W. 2.1 Km. railway bridge.

(c) N.W. 2.4 Km. railway bridge. $44^{\circ} 19' 6''$ N.: $8^{\circ} 29' 33''$ E.

(d) N.W. 2.8 Km. railway bridge.

(b), (c) and (d) are railway bridges over three small ravines. All situated between tunnels, about 50 ft. above sea level and about 100 metres from coast.

ALBISSOLA Station

W. 0.2 Km. red masonry railway bridge. 0.1 Km. from river mouth, and road bridge (0.5 Km. from coast) over mouth of River SANSOBBIA. $44^{\circ} 19' 43''$ N.: $8^{\circ} 30' 28''$ E. Landing place—small jetty at eastern end of town.

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CELLE LIGURE Station

W.S.W. 0.2 Km. masonry railway bridge (four arches) and road bridge behind over CHIAZE Torrent. Railway bridge on coast. $44^{\circ} 20' 28''$ N.: $8^{\circ} 32' 42''$ E. Landing place—small jetty at north-eastern end of village.

VARAZZE Station

W. 0.2 Km. masonry road bridge and railway bridge (three arches, 75 ft. long, 13 ft. above level of river bed). 0.25 Km. from coast. $44^{\circ} 21' 36''$ N.: $8^{\circ} 34' 23''$ E. Landing place—beach names "dell' Arenatta."

COGOLETO Station

- (a) S.W. 2.3 Km. steel railway bridge (one span of 65 ft.) over PARTIGLIOLO River. Short tunnels to right and left. Road bridge 0.2 Km. further up-stream. Close to coast. $44^{\circ} 22' 25''$ N.: $8^{\circ} 37' 30''$ E.
- (b) S.W. 1.45 Km. railway bridge and road bridge (adjoining). Both masonry. One arch of 59 ft. over River ARRESTRA. 150 metres from shore. $40^{\circ} 22' 49''$ N.: $8^{\circ} 37' 52''$ E.
- (c) E. 1.65 Km. steel railway bridge over mouth of River LERONE. Masonry road bridge, three arches, adjoining up-stream. $44^{\circ} 23' 25''$ N.: $8^{\circ} 39' 51''$ E. Landing place—poor landing; rocky coast.

VOLTRI, Mouth of River LEIRO

- (a) W. 0.75 Km. Mouth of River CERUSA.
- (1) Masonry railway bridge (three arches) 75 metres from mouth.
 - (2) Railway bridge, 175 metres from mouth. $44^{\circ} 25' 38''$ N.: $8^{\circ} 44' 29''$ E.
- (b) At mouth of LEIRO.
- (1) Steel railway bridge 50 metres from mouth. $44^{\circ} 25' 40''$ N.: $8^{\circ} 45' 4''$ E.
 - (2) Masonry road and railway bridge combined. 200 metres from mouth.

The bridges over the LEIRO are in the centre of the town and are mid-way between two church towers. Landing places—beach is at the mouths of the rivers.

SAPELLO Station

- (a) W. 0.7 Km. small stone railway bridge with stone road bridge adjoining (upstream), at mouth of the BRANEGA Torrent. Landmark—noticeable water tower close to the bridge on the west. $44^{\circ} 25' 35''$ N.: $8^{\circ} 46' 34''$ E.
- (b) E. 0.1 Km.
- (1) Masonry railway and road bridge (combined), two arches at river mouth.
 - (2) Road bridge, 50 metres further up stream. $44^{\circ} 25' 35''$ N.: $8^{\circ} 47' 11''$ E.

PEGLI, Mouth of River VARRENNA

- (1) Road bridge, five masonry arches, at river mouth.
- (2) Masonry railway bridge, 200 metres from mouth. $44^{\circ} 25' 33''$ N.: $8^{\circ} 49' 18''$ E.

There are in addition the following targets:—

CERIALE

- (a) 2.1 Km. south. Railway bridge (single track) over River GARENDA. 0.2 Km. from sea. $44^{\circ} 05' 00''$ N.: $08^{\circ} 13' 25''$ E.
- (b) Road bridge over River GARENDA. 0.9 Km. from sea. Landing place—sandy beach.

- (c) E. 1.65 Km. steel railway bridge over mouth of River LERONE. Masonry road bridge, three arches, adjoining up-stream. $44^{\circ} 23' 25''$ N. : $8^{\circ} 39' 51''$ E. Landing place—poor landing; rocky coast.

VOLTRI, Mouth of River LEIRO

- (a) W. 0.75 Km. Mouth of River CERUSA.

- (1) Masonry railway bridge (three arches) 75 metres from mouth.
(2) Railway bridge, 175 metres from mouth. $44^{\circ} 25' 38''$ N. : $8^{\circ} 44' 29''$ E.
(b) At mouth of LEIRO.

- (1) Steel railway bridge 50 metres from mouth. $44^{\circ} 25' 40''$ N. : $8^{\circ} 45' 4''$ E.
(2) Masonry road and railway bridge combined. 200 metres from mouth.

The bridges over the LEIRO are in the centre of the town and are mid-way between two church towers. Landing places—beach is at the mouths of the rivers.

SAPELLO Station

- (a) W. 0.7 Km. small stone railway bridge with stone road bridge adjoining (upstream), at mouth of the BRANEGA Torrent. Landmark—noticeable water tower close to the bridge on the west. $44^{\circ} 25' 35''$ N. : $8^{\circ} 46' 34''$ E.
(b) E. 0.1 Km.

- (1) Masonry railway and road bridge (combined), two arches at river mouth.
(2) Road bridge, 50 metres further up stream. $44^{\circ} 25' 35''$ N. : $8^{\circ} 47' 11''$ E.

PEGLI, Mouth of River VARRENNÀ

- (1) Road bridge, five masonry arches, at river mouth.
(2) Masonry railway bridge, 200 metres from mouth. $44^{\circ} 25' 33''$ N. : $8^{\circ} 49' 18''$ E.

There are in addition the following targets:—

CERIALE

- (a) 2.1 Km. south. Railway bridge (single track) over River GARENDA. 0.2 Km. from sea. $44^{\circ} 05' 00''$ N. : $08^{\circ} 13' 25''$ E.
(b) Road bridge over River GARENDA. 0.9 Km. from sea. Landing place—sandy beach.

SPOTORNO to FINALE

There are six tunnels, on an average 0.4 Km. from the sea and about 150 ft. above sea level, between these two places. $44^{\circ} 13' 30''$ N. : $08^{\circ} 25' 00''$ E. Water aerodrome. Landing could be effected anywhere along this stretch of coast which is flat and sandy.

SESTRI

- 0.7 Km. north. Tunnel, single track line, 300 ft. above sea level. 1.7 Km. from sea. Landing place—on the sea front.

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AREA "A"—SECTION III

GENOA TO SESTRI LEVANTE

Vulnerable Points:—

NERVI Station

W.N.W., 0.6 Km. Railway viaduct on curve, 15 arches, over NERVI torrent, in immediate proximity of sea, short tunnel at east end. Small inlet with landing places in the town which extends under the viaduct. 44° 23' 0" N.; 9° 1' 54" E.

BOGLIASCO Station

Immediately to E. Lofly railway viaduct over DEL POGGIO torrent. 14 arches. 100 metres from sea. Inlet with easy landing beach under viaduct. 44° 22' 43" N.; 9° 1' 54" E.

SORI Station

Immediately to N.W. Very high railway viaduct on curve over SORI torrent. 10 arches. About 525 ft. long. 100 metres from coast. Tunnels to right and left. Beach suitable for landing under viaduct. 44° 22' 19" N.; 9° 6' 10" E.

RECCO Station

N.W., 200 metres. Railway viaduct on curve at exit of tunnel on W., crossing RECCO torrent to station and then tunnel on E. 29 arches of 40 ft. each, i.e., over 400 yards long. 300 metres inland. Town between shore and viaduct. Inlet with landing beach. 44° 21' 45" N.; 9° 8' 36" E.

RAPALLO Station

S.S.W., 1.3 Km. Viaduct of S. MICHELE DI PAGANA, five arches. Between two tunnels. 100 metres from coast. Inlet with landing beach and small quay. 44° 20' 25" N.; 9° 13' 23" E.

ZOAGLI Station

N.W., 250 metres. Large viaduct (railway), seven arches, of which the central is the largest. On coast over the cover of ZOAGLI. Landing beach, steeply shelving, small quay, 4 ft. 9 ins. depth. 44° 20' 10" N.; 9° 15' 58" E.

CHIAVARI Station

(a) N.W., 350 metres. Road bridge and small low-level railway bridge over RUPINARO torrent, 150 metres from mouth. At west end of town. 44° 19' 0" N.; 9° 19' 5" E.
(b) S.E., 1 Km. Road bridge and steel railway bridge over ENTELLA torrent. 100 metres long and 300 metres from coast. Landmark, gasometer 400 metres to north-west of railway bridge. 44° 18' 41" N.; 9° 20' 0" E.

Landing place—a beach of coarse gravel in front of town.

AREA "A"—SECTION IV

SESTRI LEVANTE TO GULF OF SPEZIA

Vulnerable Points:—

RIONAGGIORE to SESTRI LEVANTE.

1.9 Km. S.E.
15 tunnels between this point and a point 4 Km. S.E. of SESTRI LEVANTE.
Most tunnels within 0.5 Km. of sea, and about 150 ft. above sea level.
Landing place—beaches and mouths of

Latitude 44° 06' 08" N.,
Longitude 9° 44' 15" E.
to
Latitude 44° 15' 45" N.,
Longitude 9° 25' 08" E.

RECCO Station

N.W., 200 metres. Railway viaduct on curve at exit of tunnel on W., crossing RECCO torrent to station and then tunnel on E. 29 arches of 40 ft. each, i.e., over 400 yards long. 300 metres inland. Town between shore and viaduct. Inlet with landing beach. 44° 21' 45" N.; 9° 8' 36" E.

RAPALLO Station

S.S.W., 1.3 Km. Viaduct of S. MICHELE DI PAGANA, five arches. Between two tunnels. 100 metres from coast. Inlet with landing beach and small quay. 44° 20' 25" N.; 9° 13' 23" E.

ZOAGLI Station

N.W., 250 metres. Large viaduct (railway), seven arches, of which the central is the largest. On coast over the cover of ZOAGLI. Landing beach, steeply shelving, small quay, 4 ft. 9 ins. depth. 44° 20' 10" N.; 9° 15' 58" E.

CHIAVARI Station

(a) N.W., 350 metres. Road bridge and small low-level railway bridge over RUPINARO torrent, 150 metres from mouth. At west end of town. 44° 19' 0" N.; 9° 19' 5" E.
(b) S.E., 1 Km. Road bridge and steel railway bridge over ENTELLA torrent. 100 metres long and 300 metres from coast. Landmark, gasometer 400 metres to north-west of railway bridge. 44° 18' 41" N.; 9° 20' 0" E.

Landing place—a beach of coarse gravel in front of town.

AREA "A"—SECTION IV**SESTRI LEVANTE TO GULF OF SPEZIA****Vulnerable Points :—****RIOMAGGIORE to SESTRI LEVANTE.**

1.9 Km. S.E.
15 tunnels between this point and a point 4 Km. S.E. of SESTRI LEVANTE.

Most tunnels within 0.5 Km. of sea, and about 150 ft. above sea level.
Landing place—beaches and mouths of rivers along this stretch.

Latitude 44° 06' 08" N.
Longitude 09° 44' 15" E.

to
Latitude 44° 15' 45" N.
Longitude 09° 25' 08" E.

SARZANA.

Latitude 44° 06' 30" N.
Longitude 09° 56' 12" E.

(a) 1.7 Km. W.
Bridge over River MAGRA (double track line).
S. 2 Km. from mouth of river.
Landing place—sandy beach on east side of river mouth.

(b) 5.1 Km. N.W.
Bridge over River MAGRA (single track line).
12.2 Km. from mouth of river.
Landing place—same as (a).

(c) Aerodrome 4.5 Km. from mouth of river.

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AREA "B"—SPEZIA TO OSTIA

The railway bridges mentioned are all on the double-track main line from GENOA to ROME via SPEZIA, PISA, LIVORNO and CIVITAVECCHIA. The section between SPEZIA and PISA is electrified. Interruption to this section would be serious as there is (1) no satisfactory alternative route between SPEZIA and PISA except by a single track and heavily graded line via AULLA*, and, (2) no alternative route between GENOA, PISA, FLORENCE and ROME except via PARMA and BOLOGNA.

Interruption to the section between PISA and ROME would not be so serious, since there is an alternative double track main line via FLORENCE.

All the road bridges mentioned are on the main road from GENOA to ROME (VIA AURELIA) via SPEZIA, PISA and CIVITAVECCHIA. There are several alternative routes between PISA and ROME, but none, except exceedingly circuitous ones, between GENOA and VIAREGGIO.

In the text the first bridge to be mentioned under each heading is nearest the coast, and the exact position is that of the railway bridge.

AREA "B"—SECTION I

MARINA DI CARRARA TO PIOMBINO

Vulnerable Points:—

MARINA DI CARRARA (Central Pier)

N.E. 2 Km. Road bridge and railway bridge over R. CARRIONE. Road bridge 0.4 Km. down stream. Railway bridge 1.8 Km. from mouth of river. Lat. 44° 3' 0" N. Long. 10° 3' 50" E. Landing—three piers in town.

MARINA DI MASSA (Pier)

N.N.E. 2.7 Km. Road bridge and railway bridge over R. FRIGIDO. Road bridge 0.6 Km. downstream. Railway bridge 2.8 Km. from mouth of river. Lat. 44° 1' 35" N. Long. 10° 7' 15" E. Landing—pier only suitable for small boats and at mouth of river. Vineyards and pine trees.

VIAREGGIO (Lighthouse)

E.N.E. 1.2 Km. Road bridge and railway bridge behind, over Canale BURLAMACCA. Lat. 43° 52' 0" N. Long. 10° 14' 23" E. Landing—small port and extensive sandy beaches. Bridges probably hidden by town.

Mouth of River SERCHIO

E.S.E. 6.6 Km. Railway bridge and road bridge adjoining, over R. SERCHIO. Lat. 43° 45' 45" N. Long. 10° 20' 35" E. Landing—sandy beaches north of river mouth. View probably obscured by pines and vineyards.

LIVORNO (Lighthouse)

- (a) N.N.E. 6.4 Km. Four railway bridges and four road bridges over small canals. 2.9 Km. from mouth of canals. Lat. 43° 35' 30" N. Long. 10° 19' 55" E.
- (b) S.S.E. 4.2 Km. road bridge and railway bridge adjoining, over R. ARDENZA, 0.7 Km. from coast. Lat. 43° 30' 50" N. Long. 10° 19' 48" E. Landing—south of river

AREA "B"—SECTION I

MARINA DI CARRARA TO PIOMBINO

Vulnerable Points:—

MARINA DI CARRARA (Central Pier)

N.E. 2 Km. Road bridge and railway bridge over R. CARRIONE. Road bridge 0.4 Km. down stream. Railway bridge 1.8 Km. from mouth of river. Lat. $44^{\circ} 3' 0''$ N.; Long. $10^{\circ} 3' 50''$ E. Landing—three piers in town.

MARINA DI MASSA (Pier)

N.N.E. 2.7 Km. Road bridge and railway bridge over R. FRIGIDO. Road bridge 0.6 Km. downstream. Railway bridge 2.8 Km. from mouth of river. Lat. $44^{\circ} 1' 35''$ N.; Long. $10^{\circ} 7' 15''$ E. Landing—pier only suitable for small boats and at mouth of river. Vineyards and pine trees.

VIAREGGIO (Lighthouse)

E.N.E. 1.2 Km. Road bridge and railway bridge behind, over Canale BURLAMACCA. Lat. $43^{\circ} 52' 0''$ N.; Long. $10^{\circ} 14' 23''$ E. Landing—small port and extensive sandy beaches. Bridges probably hidden by town.

Mouth of River SERCHIO

E.S.E. 6.6 Km. Railway bridge and road bridge adjoining, over R. SERCHIO. Lat. $43^{\circ} 45' 45''$ N.; Long. $10^{\circ} 20' 35''$ E. Landing—sandy beaches north of river mouth. View probably obscured by pines and vineyards.

LIVORNO (Lighthouse)

- (a) N.N.E. 6.4 Km. Four railway bridges and four road bridges over small canals 2.9 Km. from mouth of canals. Lat. $43^{\circ} 35' 30''$ N.; Long. $10^{\circ} 19' 55''$ E.
- (b) S.S.E. 4.2 Km. road bridge and railway bridge adjoining, over R. ARDENZA, 0.7 Km. from coast. Lat. $43^{\circ} 30' 50''$ N.; Long. $10^{\circ} 19' 48''$ E. Landing—south of river mouth.

LE FORNACI Mole

- (a) N.W. 3.2 Km. Road bridge and railway bridge over ravine at head of rocky cove. Railway bridge between two tunnels. 150 metres from coast. Lat. $43^{\circ} 27' 55''$ N.; Long. $10^{\circ} 20' 56''$ E.
- (b) N.W. 1.7 Km. Railway bridge and road bridge. Road bridge 200 metres behind railway. 150 metres from rocky shore. Lat. $43^{\circ} 27' 35''$ N.; Long. $10^{\circ} 22' 0''$ E.
- (c) N.N.E. 200 metres. Railway bridge and road bridge behind, over Torrent CHIOMA, 200 metres from rocky coast. Lat. $43^{\circ} 26' 55''$ N.; Long. $10^{\circ} 22' 48''$ E.
- (d) S.S.E. 2.2 Km. Railway bridge and road bridge adjacent, over Torrent FORTULLA. 250 metres from rocky shore. Scattered pine trees. Lat. $43^{\circ} 25' 50''$ N.; Long. $10^{\circ} 23' 38''$ E.

* Construction of this new line may not yet be complete.

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South end of Cape CASTIGLIONCELLO

- (a) N. 1 Km. Railway bridge and causeway at south end of tunnel and road bridge adjoining, over torrent on rocky foreshore. Lat. $43^{\circ} 24' 30''$ N.; Long. $10^{\circ} 24' 28''$ E.
- (b) S.E. 3.2 Km. Small road bridge and railway bridge adjoining, over R. FINE, 0.9 Km. from mouth of river. Lat. $43^{\circ} 22' 20''$ N.; Long. $10^{\circ} 27' 5''$ E. Landing—south side of river mouth.

CECINA MARINA

N.E. 2.5 Km. Large railway bridge and road bridge adjacent, over R. CECINA. Lat. $43^{\circ} 18' 50''$ N.; Long. $10^{\circ} 30' 45''$ E. 2.6 Km. from mouth of river. Landing—sandy beaches especially on south side of mouth of river.

S. VINCENZO (Railway Station)

N. 0.7 Km. Railway bridge and road bridge adjoining, over R. ROZZE, 200 metres from sandy shore. Lat. $43^{\circ} 5' 25''$ N.; Long. $10^{\circ} 32' 18''$ E. Landing—sandy beach north of river mouth.

AREA "B"—SECTION II

PIOMBINO TO OSTIA

Vulnerable Points:—

TOWER of TALAMONACCIA

- (a) S.E. 0.6 Km. Road bridge and railway bridge over torrent OSA. Road bridge 200 metres and railway bridge 500 metres from sandy shore. Lat. $42^{\circ} 32' 55''$ N.; Long. $11^{\circ} 10' 43''$ E. Landing—sandy beach south of river mouth.
- (b) S.E. 5.7 Km. Road bridge and railway bridge over R. ALBEGNA. Road bridge 600 metres and railway bridge 1.6 Km. from sandy beach. Lat. $42^{\circ} 30' 40''$ N.; Long. $11^{\circ} 12' 20''$ E. Landing—north side of river mouth.

Mouth of River ARNONE

- (a) N.N.E. 1.6 Km. Railway bridge over R. ARNONE. Lat. $42^{\circ} 18' 20''$ N.; Long. $11^{\circ} 38' 20''$ E. Landing—sandy beaches either side of river mouth.
- (b) W.N.W. 1.9 Km. Railway bridge over Torrent. Two other railway bridges 0.5 Km. distant on either side. 1.5 Km. from sandy beach. Lat. $42^{\circ} 17' 50''$ N.; Long. $11^{\circ} 39' 25''$ E.
- (c) S.E. 3.8 Km. Railway bridge over FOSSO DEL GESSO. 1.7 Km. from sandy shore. Lat. $42^{\circ} 16' 55''$ N.; Long. $11^{\circ} 40' 40''$ E.

CIVITAVECCHIA (Lighthouse)

- (a) N.N.W. 3.7 Km. Railway bridge and road bridge adjoining, 100 metres from coast. Lat. $42^{\circ} 7' 15''$ N.; Long. $11^{\circ} 46' 10''$ E.
- (b) N. 1.5 Km. Road bridge and two railway bridges, all adjoining, over FOSSO NOME DI DIO, 250 metres from coast. Lat. $42^{\circ} 6' 20''$ N.; Long. $11^{\circ} 47' 10''$ E.
- (c) S.E. 2.3 Km. Road bridge and railway bridge adjoining, over FOSSO DI SCARPA-TOSTA 100 metres from coast. Lat. $42^{\circ} 4' 45''$ N.; Long. $11^{\circ} 48' 25''$ E.

AREA "B"—SECTION II

PIOMBINO TO OSTIA

Vulnerable Points:—

TOWER of TALAMONACCIA

- (a) S.E. 0.6 Km. Road bridge and railway bridge over torrent OSA. Road bridge 200 metres and railway bridge 500 metres from sandy shore. Lat. $42^{\circ} 32' 55''$ N.; Long. $11^{\circ} 10' 43''$ E. Landing—sandy beach south of river mouth.
- (b) S.S.E. 5.7 Km. Road bridge and railway bridge over R. ALBEGNA. Road bridge 600 metres and railway bridge 1.6 Km. from sandy beach. Lat. $42^{\circ} 30' 40''$ N.; Long. $11^{\circ} 12' 20''$ E. Landing—north side of river mouth.

Mouth of River ARNONE

- (a) N.N.E. 1.6 Km. Railway bridge over R. ARNONE. Lat. $42^{\circ} 18' 20''$ N.; Long. $11^{\circ} 38' 20''$ E. Landing—sandy beaches either side of river mouth.
- (b) W.N.W. 1.9 Km. Railway bridge over Torrent. Two other railway bridges 0.5 Km. distant on either side. 1.5 Km. from sandy beach. Lat. $42^{\circ} 17' 50''$ N.; Long. $11^{\circ} 39' 25''$ E.
- (c) S.E. 3.8 Km. Railway bridge over FOSCO DEL GESSO. 1.7 Km. from sandy shore. Lat. $42^{\circ} 16' 55''$ N.; Long. $11^{\circ} 40' 40''$ E.

CIVITAVECCHIA (Lighthouse)

- (a) N.N.W. 3.7 Km. Railway bridge and road bridge adjoining, 100 metres from coast. Lat. $42^{\circ} 7' 15''$ N.; Long. $11^{\circ} 46' 10''$ E.
- (b) N. 1.5 Km. Road bridge and two railway bridges, all adjoining, over FOSCO NOME DI DIO, 250 metres from coast. Lat. $42^{\circ} 6' 20''$ N.; Long. $11^{\circ} 47' 10''$ E.
- (c) S.E. 2.3 Km. Road bridge and railway bridge adjoining, over FOSCO DI SCARPA-TOSTA, 100 metres from coast. Lat. $42^{\circ} 4' 45''$ N.; Long. $11^{\circ} 48' 25''$ E.
- (d) S.E. 4.6 Km. Road bridge and railway bridge adjoining, over FOSCO MARANGONE, 300 metres from coast. Lat. $42^{\circ} 3' 25''$ N.; Long. $11^{\circ} 49' 15''$ E. Landmark—TORRE MARANGONE.

C. LINARO

- (a) E.N.E. 4.1 Km. Road bridge and railway adjoining bridge, over FOSCO DEL CAS-TELSECCO, 400 metres from coast. Lat. $42^{\circ} 2' 30''$ N.; Long. $11^{\circ} 53' 5''$ E. Landing—beach at mouth of river.
- (b) E. 7.7 Km. Road bridge and railway bridge over RIO FIUME, 400 metres from coast. Lat. $42^{\circ} 2' 10''$ N.; Long. $11^{\circ} 55' 40''$ E.

LADISPOLI Railway Station

- E. 0.8 Km. Two adjacent railway bridges (first bridge unimportant) over FOSCO SAN-GUINARA, 0.8 Km. from sandy shore. Lat. $41^{\circ} 56' 55''$ N.; Long. $12^{\circ} 5' 20''$ E.

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AREA "C"—WEST COAST OF ITALY (SOUTH OF ROME)

Vulnerable Points :—

The following is a list of the more important bridges on the Italian railways near the West coast, South of the latitude of ROME. The bridges are enumerated in sequence from North to South, and in each case the exact position of the bridge is stated as well as further particulars by which the bridge may be identified.

Where definite particulars of landing places are available they have been described in the text, but when none of these are available, the type of coast near the objective has been named.

All bridges are RAILWAY bridges unless otherwise stated and all bridges are immediately adjacent to the shore unless their distance from this is given in kilometres.

2. The following objectives appear to be of special significance :—

Section I.—Near FORMIA, a double-track, electrified main line from ROME to NAPLES. Interruption to traffic on this route would not completely prevent traffic from ROME to NAPLES, owing to the existence of another double track main line further inland.

Section II.—Near SALERNO, a double-track, electrified, main line from NAPLES to BATTIPAGLIA. This place is the junction for—

(a) the main line along the west coast to Southern Italy, and

(b) the main line from NAPLES to POTENZA, TARANTO, BARI and BRINDISI.

There are no alternative routes for (a) and no really satisfactory alternative routes for (b). Owing to an important engineering works in the vicinity, the line near SALERNO is peculiarly open to interruption along a stretch of track which acts as a bottle-neck for traffic to the South of NAPLES.

Section IV.—PAOLA—There is an excellent landing beach here. The west coast line (single track, electrified) from NAPLES to REGGIO DI CALABRIA follows the shore closely for a considerable distance both to the North and to the South. Along this stretch of line there are numerous small bridges.

PAOLA is also the junction for the branch line (single track, steam) to COSENZA, whence by further branch lines CATANZARO (in the Gulf of Squillace) and the Gulf of TARANTO may be reached.

Section VI.—The mouth of the River PETRACE is immediately to the south of GIOJA TAURO junction. Road and railway traffic between NAPLES and REGGIO and Sicily can effectively be interrupted here.

There are two railway bridges—

(a) on the main west coast line (single-track electrified) at this place, and

(b) on the branch line from GIOJA to SINOPOLI.

Interruption to traffic on this route would not completely prevent traffic from ROME to NAPLES, owing to the existence of another double track main line further inland.

Section II.—Near SALERNO, a double-track, electrified, main line from NAPLES to BATTIPAGLIA. This place is the junction for—

- (a) the main line along the west coast to Southern Italy, and
- (b) the main line from NAPLES to POTENZA, TARANTO, BARI and BRINDISI.

There are no alternative routes for (a) and no really satisfactory alternative routes for (b). Owing to an important engineering works in the vicinity, the line near SALERNO is peculiarly open to interruption along a stretch of track which acts as a bottle-neck for traffic to the South of NAPLES.

Section IV.—PAOLA—There is an excellent landing beach here. The west coast line (single track, electrified) from NAPLES to REGGIO DI CALABRIA follows the shore closely for a considerable distance both to the North and to the South. Along this stretch of line there are numerous small bridges.

PAOLA is also the junction for the branch line (single track, steam) to COSENZA, whence by further branch lines CATANZARO (in the Gulf of Squillace) and the Gulf of TARANTO may be reached.

Section VI.—The mouth of the River PETRACE is immediately to the south of GIOJA TAURO junction. Road and railway traffic between NAPLES and REGGIO and Sicily can effectively be interrupted here.

There are two railway bridges—

- (a) on the main west coast line (single-track electrified) at this place, and
- (b) on the branch line from GIOJA to SINOPOLI.

SECTIONS (FROM NORTH TO SOUTH)

- I.—GAETA to VOLTURNO RIVER.
- II.—CAPRI to POINT LICOSA.
- III.—POINT LICOSA to CAPE PALINURO.
- IV.—CAPE PALINURO to CAPE SUVERO.
- V.—CAPE SUVERO to CAPE VATICANO.
- VI.—CAPE VATICANO to POINT di PELLARO.

The Sections of the coast not included in the above do not possess important objectives.

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AREA "C"—SECTION I
GAETA TO VOLTURNO RIVER

Vulnerable Points:—

FORMIA.	1.7 Km. N.E. Bridge over river and road. Steel girder 133 ft. long. Beach.	Latitude 41° 15' 55" N., Longitude 13° 37' 25" E.
MINTURNO (Station).	(a) 4.8 Km. E.S.E. Bridge over River AUSENTE. Steel girder. 3 Km. from beach. (b) 6.0 Km. E.S.E. Bridge over River GARIGLIANO. 225 ft. long. 3.3 Km. from beach. (c) Bridge over road and immediately to S.E.	Latitude 41° 14' 45" N., Longitude 13° 28' 25" E. Latitude 41° 14' 35" N., Longitude 13° 47' 30" E.

AREA "C"—SECTION II
CAPRI ISLAND TO POINT LICOSA

Vulnerable Points:—

Between VIETRI SAL MARE and SALERNO STATION.	At least 3 bridges on side of mountain. 0.5 Km. from shore. Landing place west of River IRNO.	Latitude 40° 40' 30" N., Longitude 14° 44' 30" E.
SALERNO STATION.	(a) 0.3 Km. from shore. Landing place—sandy beach west of River IRNO. (b) Immediately east:— 2 railway bridges and 1 road bridge. 100 ft. long. 0.2 Km. from shore. Landing place—sandy beach near mouth.	Latitude 40° 40' 25" N., Longitude 14° 46' 25" E. Latitude 40° 40' 25" N., Longitude 14° 46' 30" E.
PASTENA.	0.7 Km. N.W. Bridge (and road bridge immediately behind) 0.1 Km. from beach.	Latitude 40° 40' 00" N., Longitude 14° 47' 15" E.
MERCATELLO.	Bridge (and road bridge immediately behind) 0.1 Km. from sea.	Latitude 40° 39' 30" N., Longitude 14° 48' 00" E.
ANGELLARA.	Bridge. 0.2 Km. from sea.	Latitude 40° 39' 10" N., Longitude 14° 48' 40" E.
SAN LEONARDO.	1 Km. E.S.E. Bridge over River FORNI. 1.5 Km. from sea.	Latitude 40° 38' 40" N., Longitude 14° 50' 35" E.
PONTECAGNANO FAIANO (Station).	0.6 Km. N.W. Bridge over River PICENTO. 3.0 Km. from sea.	Latitude 40° 38' 30" N., Longitude 14° 52' 00" E.

AREA "C"—SECTION III
LICOSA—C. PALINURA

Vulnerable Points:—

Latitude 40° 10' 50" N.,

AREA "C"—SECTION II

CAPRI ISLAND TO POINT LICOSA

Vulnerable Points:—

Between VIETRI SAL MARE and SALERNO STATION.	At least 3 bridges on side of mountain. 0.5 Km. from shore. Landing place west of River IRNO.	Latitude 40° 40' 30" N., Longitude 14° 44' 30" E.
SALERNO STATION.	(a) 0.3 Km. from shore. Landing place—sandy beach west of River IRNO. (b) Immediately east:— 2 railway bridges and 1 road bridge. 100 ft. long. 0.2 Km. from shore. Landing place—sandy beach near mouth.	Latitude 40° 40' 25" N., Longitude 14° 46' 25" E.
PASTENA.	0.7 Km. N.W. Bridge (and road bridge immediately behind) 0.1 Km. from beach.	Latitude 40° 40' 00" N., Longitude 14° 47' 15" E.
MERCATELLO.	Bridge (and road bridge immediately behind) 0.1 Km. from sea.	Latitude 40° 39' 30" N., Longitude 14° 48' 00" E.
ANGELLARA.	Bridge. 0.2 Km. from sea.	Latitude 40° 39' 10" N., Longitude 14° 48' 40" E.
SAN LEONARDO.	1 Km. E.S.E. Bridge over River FORNI. 1.5 Km. from sea.	Latitude 40° 38' 40" N., Longitude 14° 50' 35" E.
PONTECAGNANO FAIANO (Station).	0.6 Km. N.W. Bridge over River PICENTO. 3.0 Km. from sea.	Latitude 40° 38' 30" N., Longitude 14° 52' 00" E.

AREA "C"—SECTION III

LICOSA—C. PALINURA

Vulnerable Points:—

Mouth of River ALLIENTO.	(a) 2.6 Km. N.E. Bridge over River Palistro 2.5 Km. from sea. (b) 2.0 Km. S.E. Road bridge and railway bridge immediately behind. 0.9 Km. from sea.	Latitude 40° 10' 50" N., Longitude 15° 09' 20" E.
PISCIOTTA STATION.	(a) 0.6 Km. N.W. (b) 0.2 Km. N.W. Two stone bridges. (c) 0.2 Km. S.E. Bridge. Landing place—Marina, PISCIOTTA.	Latitude 40° 06' 20" N., Longitude 15° 13' 50" E. (Positioning station.)
C. TORRACO.	(a) 0.7 Km. N. (b) 0.4 Km. N.E. Stone bridges (a) over river. 0.4 Km. from sea. Landing place—bed of torrent.	Latitude 40° 04' 55" N., Longitude 15° 15' 30" E.

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AREA "C"—SECTION II

CAPRI ISLAND TO POINT LICOSA

Vulnerable Points:—

Between VIETRI SAL MARE and SALERNO STATION.	At least 3 bridges on side of mountain. 0.5 Km. from shore. Landing place west of River IRNO.	Latitude 40° 40' 30" N., Longitude 14° 44' 30" E.
SALERNO STATION.	(a) 0.3 Km. from shore. Landing place—sandy beach west of River IRNO. (b) Immediately east:— 2 railway bridges and 1 road bridge. 100 ft. long. 0.2 Km. from shore. Landing place—sandy beach near mouth.	Latitude 40° 40' 25" N., Longitude 14° 46' 25" E.
PASTENA.	0.7 Km. N.W. Bridge (and road bridge immediately behind) 0.1 Km. from beach.	Latitude 40° 40' 00" N., Longitude 14° 47' 15" E.
MERCATELLO.	Bridge (and road bridge immediately behind) 0.1 Km. from sea.	Latitude 40° 39' 30" N., Longitude 14° 48' 00" E.
ANCELLARA.	Bridge. 0.2 Km. from sea.	Latitude 40° 39' 10" N., Longitude 14° 48' 40" E.
SAN LEONARDO.	1 Km. E.S.E. Bridge over River FORNI 1.5 Km. from sea.	Latitude 40° 38' 40" N., Longitude 14° 50' 35" E.
PONTECAGNANO FAIANO (Station).	0.6 Km. N.W. Bridge over River PICENTO. 3.0 Km. from sea.	Latitude 40° 38' 30" N., Longitude 14° 52' 00" E.

AREA "C"—SECTION III

LICOSA—C. PALINURA

Vulnerable Points:—

Mouth of River ALIENTO.	(a) 2.6 Km. N.E. Bridge over River Palisturo 2.5 Km. from sea. (b) 2.0 Km. S.E. Road bridge and railway bridge immediately behind. 0.9 Km. from sea.	Latitude 40° 10' 50" N., Longitude 15° 09' 20" E.
PISCIOTTA STATION.	(a) 0.6 Km. N.W. (b) 0.2 Km. N.W. Two stone bridges. (c) 0.2 Km. S.E. Bridge. Landing place—Marina, PISCIOTTA.	Latitude 40° 06' 20" N., Longitude 15° 13' 50" E. (Positioning station.)
C. TORRACO.	(a) 0.7 Km. N. (b) 0.4 Km. N.E. Stone bridges (a) over river. 0.4 Km. from sea. Landing place—bed of torrent.	Latitude 40° 04' 55" N., Longitude 15° 15' 30" E.

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AKEA—"C" SECTION IV

C. PALINURA TO C. SUVERO

Vulnerable Points:—

<i>Mouth of River BUSSENTO.</i>	3.1 Km. N.N.W. Railway bridge over the BUSSENTO river. 3.1 Km. from beach.	Latitude 40° 05' 30" N., Longitude 15° 29' 45" E.
<i>VILLAMARE.</i>	Road bridge and railway bridge (immediately behind) over the River CACAFVIA. Both bridges within 0.4 Km. of beach. Landing place at mouth of river.	Latitude 40° 04' 50" N., Longitude 15° 35' 05" E.
<i>SAPRI.</i>	Road bridge and railway bridge (immediately behind) over wide river mouth. Both about 0.5 Km. from beach.	Latitude 40° 04' 25" N., Longitude 15° 38' 30" E.
<i>ACQUA FREDDA Station.</i>	0.8 Km. south. Two viaducts. 0.1 Km. from rocky shore.	Latitude 40° 01' 40" N., Longitude 15° 38' 45" E.
<i>Pt. Tre di CAINO.</i>	2.3 Km. S.E. Railway bridge at exit of tunnel 0.6 Km. from shore. Landmark, Castle AGNOLA. Landing place on beach at head of bay. 3 Km. S.E. railway and road bridge over River CASTROCUCCO. 650 ft. long. Railway bridge has 5 arches. Both 1 Km. from shore.	Latitude 39° 55' 40" N., Longitude 15° 45' 55" E.
<i>Mouth of River LAO.</i>	Railway and road bridge (immediately behind) over River LAO, after short tunnel. 2.9 Km. inland. Landmark, trees bordering river.	Latitude 39° 46' 50" N., Longitude 15° 49' 50" E.
<i>Mouth of River ABATEMARCO.</i>	Railway bridge 1.6 Km. inland. Bridge 650 ft. long.	Latitude 39° 45' 45" N., Longitude 15° 49' 15" E.

Vulnerable Points:—

Between Pt. Di CIRELLA and C. SUVERO there are numerous small railway bridges over streams. Only the more important bridges are named below.

<i>DIAMANTE.</i>	Road bridge 0.3 Km. from mouth of river. Railway bridge 0.6 Km. from mouth of river.	Latitude 39° 40' 50" N., Longitude 15° 49' 20" E.
<i>CAPO BONIFATI.</i>	(a) 4.3 Km. N. Bridge (450 ft. long) over torrent of SAN GINETO 0.3 Km. from shore. (b) 3.2 Km. N. Bridge of River SANGINETO, 475 ft. long.	Latitude 39° 34' 55" N., Longitude 15° 52' 00" E.

<i>SAPRI.</i>	behind) over the River CACAFAVIA. Both bridges within 0.4 Km. of beach. Landing place at mouth of river.	Longitude 15° 35' 43" E. Latitude 40° 04' 25" N., Longitude 15° 38' 30" E.
<i>ACQUA FREDDA Station.</i>	Road bridge and railway bridge (immediately behind) over wide river mouth. Both about 0.5 Km. from beach.	Latitude 40° 01' 40" N., Longitude 15° 38' 45" E.
<i>Pt. Tre di CAINO.</i>	0.8 Km. south. Two viaducts. 0.1 Km. from rocky shore. 2.3 Km. S.E. Railway bridge at exit of tunnel 0.6 Km. from shore. Landmark, Castle AGNOLA. Landing place on beach at head of bay. 3 Km. S.E. railway and road bridge over River CASTROCUCO. 650 ft. long. Railway bridge has 5 arches. Both 1 Km. from shore.	Latitude 39° 55' 40" N., Longitude 15° 45' 55" E.
<i>Mouth of River LAO.</i>	Railway and road bridge (immediately behind) over River LAO, after short tunnel. 2.9 Km. inland. Landmark, trees bordering river.	Latitude 39° 46' 30" N., Longitude 15° 49' 50" E.
<i>Mouth of River ABATEMARCO.</i>	Railway bridge 1.6 Km. inland. Bridge 650 ft. long.	Latitude 39° 45' 45" N., Longitude 15° 49' 15" E.

Vulnerable Points :—

Between Pt. Di CIRELLA and C. SUVERO there are numerous small railway bridges over streams. Only the more important bridges are named below.

<i>DIAMANTE.</i>	Road bridge 0.3 Km. from mouth of river. Railway bridge 0.6 Km. from mouth of river.	Latitude 39° 40' 50" N., Longitude 15° 49' 20" E.
<i>CAPO BONIFATI.</i>	(a) 4.3 Km. N. Bridge (450 ft. long) over torrent of SAN GINETO. 0.3 Km. from shore. (b) 3.2 Km. N. Bridge of River SANGINETO, 475 ft. long. Landmark, Castle del Principe. 0.8 Km. N. of bridge. (c) 0.7 Km. N. Railway and road bridge over R.S. PEITRO at coast. Landing place a beach at mouth.	Latitude 39° 34' 55" N., Longitude 15° 32' 00" E.
<i>CETRARO.</i>	0.8 Km. N.W. Steel bridge over River CETRARO. 0.3 Km. from beach. Landmark, white station buildings. Landing place, mouth of river.	Latitude 39° 33' 35" N., Longitude 15° 52' 25" E.
<i>GUARDIA, Piemontese Terme.</i>	0.7 Km. N.W. Railway bridge (masonry) on the shore, two arches. Landing place. Beach at mouth of river.	Latitude 39° 28' 05" N., Longitude 15° 58' 30" E.

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SECTION IV—continued.

MARINA DI FUSCALDO.	(a) 3 Km. N.N.W. on coast. (b) 1.9 Km. N.N.W. on coast. (c) 0.8 Km. N.N.W. on coast. (d) 0.5 Km. S.S.E. on coast. (e) 0.7 Km. S.S.E. on coast. (b) and (c) are the largest of this series of bridges. (a) 0.4 Km. N.N.E. (b) Bridge over river, on shore. (b) Important road viaduct 0.6 Km. inland. 0.7 Km. east of station, not to be confused with bridge on road joining Paola and railway station. Excellent landing beach.	Latitude 39° 26' 10" N., Longitude 16° 00' 00" E. Latitude 39° 25' 30" N., Longitude 16° 00' 20" E. Latitude 39° 24' 55" N., Longitude 16° 00' 35" E. Latitude 39° 24' 15" N., Longitude 16° 00' 50" E. Latitude 39° 24' 08" N., Longitude 16° 00' 50" E. Latitude 39° 21' 45" N., Longitude 16° 01' 50" E.
MARINA DI PAOLA STATION.	(a) 1.9 Km. N.N.E. (b) Bridge over stream on beach. (b) 1.4 Km. N.N.E. Bridge over stream on beach. (a) 1.4 Km. N. Bridge over River DIAMANTE on shore. (b) 0.5 Km. S. bridge 0.1 Km. from beach. Landmark, mount COCUZZO, about 6.8 Km. E.S.E. of objective. Landing at mouth of Torrent. (c) 2.9 Km. S. Bridge on shore. All railway bridges on the coast over rivers, the widest of which is (c) over the River VARDANO.	Latitude 39° 19' 40" N., Longitude 16° 02' 40" E. Latitude 39° 19' 20" N., Longitude 16° 02' 45" E. Latitude 39° 15' 30" N., Longitude 16° 03' 40" E. Latitude 39° 14' 20" N., Longitude 16° 03' 35" E. Latitude 39° 13' 10" N., Longitude 16° 03' 35" E.
AMANTEA.	(a) 2.7 Km. N. N. bridge over River CAFARDA. Landing at mouth. (b) 0.5 Km. N.N.E. Rail and road (steel) bridges. Landing at mouth of river. (c) 1.9 Km. S.S.E. Rail bridge on shore, road bridge 0.5 Km. from shore. All railway bridges on coast, of which (b) is the largest. There are also two smaller bridges between (b) and (c). Railway and road bridge (immediately inland). Landing at mouth. Landmark, TORRE DI GUARDIA, 2.7 Km. to the north, a round white tower. Also white pebbles of river bed itself.	Latitude 39° 09' 30" N., Longitude 16° 04' 00" E. Latitude 39° 08' 20" N., Longitude 16° 04' 05" E. Latitude 39° 07' 05" N., Longitude 16° 04' 40" E.
MOUTH OF RIVER OLIVA.		Latitude 39° 04' 35" N., Longitude 16° 05' 25" E.
NOCERA TERINESE STATION.	2.3 Km. N.W. Bridge over delta of River SAVUTO, the	Latitude 39° 02' 05" N., Longitude 16° 05' 15" E.

S. LUCIDO.	0.7 Km. east of station, not to be confused with bridge on road joining Paola and railway station. Excellent landing beach.	Latitude 39° 19' 40" N., Longitude 16° 02' 40" E. Latitude 39° 19' 20" N., Longitude 16° 02' 45" E.
FIUMEFREDDO STATION.	(a) 1.9 Km. N.N.E. Bridge over stream on beach. (b) 1.4 Km. N.N.E. Bridge over stream on beach. (a) 1.4 Km. N. Bridge over River DIAMANTE on shore. (b) 0.5 Km. S. bridge 0.1 Km. from beach. Landmark, mount COCUZZO, about 6.8 Km. E.S.E. of objective. Landing at mouth of Torrent. (c) 2.9 Km. S. Bridge on shore. All railway bridges on the coast over rivers, the widest of which is (c) over the River VARDANO.	Latitude 39° 15' 30" N., Longitude 16° 03' 40" E. Latitude 39° 14' 20" N., Longitude 16° 03' 35" E. Latitude 39° 13' 10" N., Longitude 16° 03' 35" E.
AMANTEA.	(a) 2.7 Km. N. N. bridge over River CAFARDA. Landing at mouth. (b) 0.5 Km. N.N.E. Rail and road (steel) bridges. Landing at mouth of river. (c) 1.9 Km. S.S.E. Rail bridge on shore, road bridge 0.5 Km. from shore. All railway bridges on coast, of which (b) is the largest. There are also two smaller bridges between (b) and (c).	Latitude 39° 09' 30" N., Longitude 16° 04' 00" E. Latitude 39° 08' 20" N., Longitude 16° 04' 05" E. Latitude 39° 07' 05" N., Longitude 16° 04' 40" E.
MOUTH OF RIVER OLIVA.	Railway and road bridge (immediately inland). Landing at mouth. Landmark, TORRE DI GUARDIA, 2.7 Km. to the north, a round white tower. Also white pebbles of river bed itself.	Latitude 39° 04' 35" N., Longitude 16° 05' 25" E.
NOCERA TERINESE STATION.	2.3 Km. N.W. Bridge over delta of River SAVUTO, three arches. Landmark, wooded banks of river. Landing to the north of the mouth.	Latitude 39° 02' 05" N., Longitude 16° 06' 15" E.
CAPE SUVERO.	5.0 Km. N.N.W. Railway bridge over stream V. CALA, on coast.	Latitude 38° 59' 40" N., Longitude 16° 08' 13" E.

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AREA "C"—SECTION V.

CAPE SUVERO TO CAPE VATICANO

Vulnerable Points:—

CAPE SUVERO.	2.7 Km. E.S.E. Road bridge and railway bridge (immediately behind). 0.3 Km. from sea—lagoon between road and sea.	Latitude 38° 56' 50" N., Longitude 16° 11' 08" E.
BASTIONE DE MALTA.	Road bridge and railway bridge (immediately behind). 0.3 Km. from sea.	Latitude 38° 55' 45" N., Longitude 16° 13' 18" E.
S. EUFEMIA LAMEZIA.	1.2 Km. W.N.W. Road bridge and railway bridge (reinforced concrete) over BAGNI TORRENT. 2.3 Km. from shore. Landing place—mouth of Torrent.	Latitude 38° 55' 30" N., Longitude 16° 14' 48" E.
PIZZO.	(a) 6.0 Km. N.E. Railway bridge—steel girder, 475 ft. long. 1.1 Km. from sea. (b) Road bridge (9 arches), 1.5 Km. from coast. Both bridges over River ANGITOLA. Landing place north of river mouth—on beach.	Latitude 38° 46' 20" N., Longitude 16° 13' 50" E.
CAPE COZZO.	2.1 Km. E.N.E. Railway bridge and road bridge 0.2 Km. from coast.	Latitude 38° 43' 25" N., Longitude 15° 59' 50" E.
CAPE VATICANO.	Around the headland the railway runs between 160 and 220 ft. above sea-level over seven bridges and along masonry viaducts.	Latitude 38° 37' 15" N., Longitude 15° 49' 55" E.

AREA "C"—SECTION VI

CAPE VATICANO TO PONTA DI PELLARO

Vulnerable Points:—

NICOTERA.	1.0 Km. N.W. Bridge over ravine (one arch). 0.1 Km. from sea. Landing place at mouth of ravine.	Latitude 38° 33' 20" N., Longitude 15° 55' 30" E.
ROSARNO.	(a) 1.9 Km. N.W. Bridge over River IL SIGNORE 3.6 Km. from sea. (b) 0.8 Km. N.N.W. Bridge over River MESIMA—325 ft. long. 4.2 Km. from shore. There is also a causeway here. Landing place north of River MESIMA—on beach.	Latitude 38° 29' 50" N., Longitude 15° 58' 08" E.
Mouth of River PETRACE.	Two steel girder railway bridges and a	Latitude 38° 24' 50" N.

PIZZO. 2-3 Km. from shore. Landing place—mouth of Torrent. (a) 6-0 Km. N.E. Railway bridge—steel girder, 475 ft. long. 1-1 Km. from sea. (b) Road bridge (9 arches), 1-5 Km. from coast. Both bridges over River ANGITOLA. Landing place north of river mouth—on beach.	Latitude 38° 46' 20" N., Longitude 16° 13' 50" E.
CAPE COZZO.	2-1 Km. E.N.E. Railway bridge and road bridge 0-2 Km. from coast. Latitude 38° 43' 25" N., Longitude 15° 59' 50" E.
CAPE VATICANO.	Around the headland the railway runs between 160 and 220 ft. above sea-level over seven bridges and along masonry viaducts. Latitude 38° 37' 15" N., Longitude 15° 49' 55" E.

AREA "C"—SECTION VI

CAPE VATICANO TO PONTA DI PELLARO

Vulnerable Points :—

NICOTERA.	1-0 Km. N.W. Bridge over ravine (one arch). 0-1 Km. from sea. Landing place at mouth of ravine.	Latitude 38° 33' 20" N., Longitude 15° 55' 30" E.
ROSARNO.	(a) 1-9 Km. N.W. Bridge over River IL SIGNORE 3-6 Km. from sea. (b) 0-8 Km. N.N.W. Bridge over River MESIMA—325 ft. long. 4-2 Km. from shore. There is also a causeway here. Landing place north of River MESIMA—on beach.	Latitude 38° 29' 50" N., Longitude 15° 58' 08" E.
Mouth of River PETRACE.	Two steel girder railway bridges and a masonry road bridge with three arches. 1-3 Km. from mouth of river. Immediately south of river, railway bridges over roads. Railway junction—an important objective. Landing—south of river mouth on sandy beach.	Latitude 38° 24' 50" N., Longitude 15° 53' 40" E.
BAGNARA Station.	0-3 Km. S.W. Steel girder railway bridge and a masonry bridge with three arches.	Latitude 38° 16' 50" N., Longitude 15° 48' 05" E.
CATONA Station.	(a) 0-4 Km. N.W. Bridge over River CATONA. (b) 1-7 Km. S. Bridge over River S. GUISEPPE.	Latitude 38° 11' 20" N., Longitude 15° 38' 30" E. Latitude 38° 10' 20" N., Longitude 15° 38' 40" E.
REGGIO DI CALABRIA.	Immediately north of P. CALAMIZZI. Bridge over river at south end of town.	Latitude 38° 05' 10" N., Longitude 15° 38' 05" E.

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AREA "D"

SOUTH COAST OF ITALY FROM CAPE DELL ARMI TO
CAPE RONDINELLA (TARANTO)

The railways along this section of the coast are for the most part of less national importance than those along the east or west coasts. The southern railways are primarily of local importance, and are invariably single track.

Branch lines crossing from the west coast to the south coast join the south coastal railway at:—

- (a) CATANZARO MARINA (from S. EUFEMIA on W.).
- (b) SIBARI (from PAOLA on W.).
- (c) METAPONTO (from BATTIPAGLIA and NAPLES).

The section of track between METAPONTO and TARANTO is accordingly the most important as it includes both the main line from TARANTO to NAPLES as well as the only line to the south-west. Between METAPONTO and TARANTO, the most important bridges vulnerable from the sea are those crossing the rivers BRADANO and LATO. The railway in this section runs close to the shore.

The description of the coast is divided into the following sections:—

- I.—CAPE DELL ARMI to CAPE SPARTIVENTO.
- II.—CAPE SPARTIVENTO to CAPE STILO.
- III.—CAPE STILO to CAPE RIZZUTO.
- IV.—CAPE DI COLONNE to CAPE TRIONTO.
- V.—CAPE TRIONTO to POINT RONDINELLA (TARANTO).

AREA "D"—SECTION I

CAPE DELL ARMI TO CAPE SPARTIVENTO

Note:—A very considerable goods traffic is carried on all sections of the line in Area "D."

Vulnerable Points:—

MELITO DI PORTO SALVO Station

- (a) E., 1.1 Km. Bridge over R. di MELITO. 37° 55' 5" N.; 15° 47' 40" E.
- (b) E., 5.3 Km. Railway bridge over R. ACRIFA, 250 ft. long, and road bridge (225 ft. long, reinforced concrete). 0.1 Km. from coast. Landmark, factory chimney of cement works. Landing place at river mouth. 37° 55' 20" N.; 15° 50' 35" E.

AMENDOLEA R., E. of railway station, steel girder railway bridge (8 arches). 630 ft. long, and a road bridge immediately inland. Landing place to left of river mouth. 37° 55' 40" N.; 15° 53' 35" E.

BOVA MARINA

- (a) E. of station, railway bridge over R. SIDERONI, 190 ft. long. Road bridge, immediately behind. 0.2 Km. from coast. Landing place to left of river mouth in village.

line to the south-west. Between METAPONTO and TARANTO, the most important bridges vulnerable from the sea are those crossing the rivers BRADANO and LATO. The railway in this section runs close to the shore.

The description of the coast is divided into the following sections:—

- I.—CAPE DELL ARMI to CAPE SPARTIVENTO.
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- III.—CAPE STILO to CAPE RIZZUTO.
- IV.—CAPE DI COLONNE to CAPE TRIONTO.
- V.—CAPE TRIONTO to POINT RONDINELLA (TARANTO).

AREA "D"—SECTION I

CAPE DELL ARMI TO CAPE SPARTIVENTO

Note :—A very considerable goods traffic is carried on all sections of the line in Area "D."

Vulnerable Points :—

MELITO DI PORTO SALVO Station

- (a) E., 1.1 Km. Bridge over R. di MELITO. $37^{\circ} 55' 5''$ N. : $15^{\circ} 47' 40''$ E.
- (b) E., 5.3 Km. Railway bridge over R. ACRIFA, 250 ft. long, and road bridge (225 ft. long, reinforced concrete). 0.1 Km. from coast. Landmark, factory chimney of cement works. Landing place at river mouth. $37^{\circ} 55' 20''$ N. : $15^{\circ} 56' 35''$ E.

AMENDOLEA R., E. of railway station, steel girder railway bridge (8 arches). 630 ft. long, and a road bridge immediately inland. Landing place to left of river mouth. $37^{\circ} 55' 40''$ N. : $15^{\circ} 53' 35''$ E.

BOVA MARINA

- (a) E. of station, railway bridge over R. SIDERONI, 190 ft. long. Road bridge, immediately behind. 0.2 Km. from coast. Landing place to left of river mouth in village. $37^{\circ} 55' 50''$ N. : $15^{\circ} 55' 45''$ E.
- (b) E.S.E. of station, 2.3 Km. railway bridge and road bridge, immediately behind, over R. PASQUALE. Only visible with difficulty from the sea. Landing place left of river mouth. $37^{\circ} 55' 30''$ N. : $15^{\circ} 57' 10''$ E.

PALIZZI MARINA Station

W., 0.4 Km., road bridge and railway bridge over river 0.2 Km. from coast. Landing place to left of river mouth. Landmark, a clock tower in the western outskirts of village. $37^{\circ} 55' 15''$ N. : $15^{\circ} 59' 10''$ E.

C. SPARTIVENTO

W., 1.4 Km. of lighthouse, railway bridge and road bridge, 625 ft. long. 0.25 Km. from beach. Landing place to right of river mouth. $37^{\circ} 55' 20''$ N. : $16^{\circ} 3' 0''$ E

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AREA "D"—SECTION II

CAPE SPARTIVENTO TO CAPE STILO

Vulnerable Points:—

MARINA DI BRANCALEONE Station

N.E. 0.4 Km., masonry railway bridge (three arches) 250 ft. long over River FRAZZO. 0.2 Km. from beach. Landing place—river mouth, in village. 37° 57' 10" N.: 16° 6' 20" E.

C. BRUZZANO

N. 2 Km., railway bridge, 625 ft. long, over the torrent. VERDE, 0.2 Km. from shore. Landing place—at river mouth. 38° 3' 25" N.: 16° 8' 40" E.

BOVALINO MARINA

- (a) S.W. 3 Km., steel girder railway bridge, 160 ft. long, road bridge (immediately behind). Landing place—at mouth of river. 38° 7' 30" N.: 16° 9' 40" E.
- (b) S.W., 1.8 Km., lofty and massive railway bridge (immediately behind). 0.2 Km. from coast. Landing place at river mouth. 38° 8' 0" N.: 16° 10' 10" E.

ARDORE MARINA

- (a) N.E., 2 Km., railway bridge and road bridge (625 ft. long). 0.2 Km. from shore. Landing place at river mouth. 38° 11' 25" N.: 16° 13' 10" E.
- (b) N.E., 3.5 Km. (S. ILARIO Railway Station) railway bridge and road bridge, 475 ft. long. 0.2 Km. from coast. Landing place at river mouth. 38° 12' 0" N.: 16° 13' 45" E.

GERACE MARINA Station

- (a) S.W., 1.5 Km., steel girder railway bridge and road bridge, over River di GERACE, 0.2 Km. from shore. 38° 13' 20" N.: 16° 15' 15" E.
- (b) N.E., 2.3 Km., steel girder railway bridge (500 ft. long) and road bridge over the River SIDERNO or NOVITO. 0.1 Km. from beach. Landing place at river mouth. 38° 14' 55" N.: 16° 16' 50" E.

GIOIOSA MARINA Station

S.W., 1 Km., steel girder railway bridge (five spans) 650 ft. long and road bridge (immediately behind) over River TORBIDO. 0.4 Km. from beach. Landing on right of river mouth. 38° 17' 35" N.: 16° 19' 20" E.

CAULONIA Station

N.E., 0.8 Km., three railway bridges and road bridges over mouths of River ALLARO, each 90-120 ft. long, and 1,000-1,300 ft. from each other. 0.3 Km. E.N.E. of CAMILLARI Tower. 0.4 Km. from shore. Landing in the mouth of the river. 38° 20' 45" N.: 16° 28' 30" E.

AREA "D"—SECTION III

CAPE STILO TO CAPE RIZZUTO

Vulnerable Points:—

S. SOSTENE Station

(S. of Soverato.) S., 1.0 Km., steel girder railway bridge (painted red) over River ALACA. 0.6 Km. from beach. Landmark—steep white bed of stream. Landing place at

(b) S.W., 1-8 Km., only and massive railway bridge (625 ft. long). 0-2 Km. from shore. 38° 8' 0" N.: 16° 10' 10" E.

ARDORE MARINA

- (a) N.E., 2 Km., railway bridge and road bridge (625 ft. long). 0-2 Km. from shore. Landing place at river mouth. 38° 11' 25" N.: 16° 13' 10" E.
- (b) N.E., 3-5 Km. (S. ILARIO Railway Station) railway bridge and road bridge, 475 ft. long. 0-2 Km. from coast. Landing place at river mouth. 38° 12' 0" N.: 16° 13' 45" E.

GERACE MARINA Station

- (a) S.W., 1-5 Km., steel girder railway bridge and road bridge, over River di GERACE, 0-2 Km. from shore. 38° 13' 20" N.: 16° 15' 15" E.
- (b) N.E., 2-3 Km., steel girder railway bridge (500 ft. long) and road bridge over the River SIDERNO or NOVITO. 0-1 Km. from beach. Landing place at river mouth. 38° 14' 55" N.: 16° 16' 50" E.

GIOIOSA MARINA Station

- S.W., 1 Km., steel girder railway bridge (five spans) 650 ft. long and road bridge (immediately behind) over River TORBIDO. 0-4 Km. from beach. Landing on right of river mouth. 38° 17' 35" N.: 16° 19' 20" E.

CAULONIA Station

- N.E., 0-8 Km., three railway bridges and road bridges over mouths of River ALIARO, each 90-120 ft. long, and 1,000-1,300 ft. from each other. 0-3 Km. E.N.E. of CAMILLARI Tower. 0-4 Km. from shore. Landing in the mouth of the river. 38° 20' 45" N.: 16° 28' 30" E.

AREA "D"—SECTION III

CAPE STILO TO CAPE RIZZUTO

Vulnerable Points:—

S. SOSTENE Station

- (S. of Soverato.) S., 1-0 Km., steel girder railway bridge (painted red) over River ALACA. 0-6 Km. from beach. Landmark—steep, white bed of stream. Landing place at mouth of river. 38° 38' 35" N.: 16° 33' 15" E.

SOVERATO Station

- S., 0-9 Km., two long steel girder railway bridges over River ANCINALE. 0-6 Km. from beach. Landing place at river mouth, orange and mulberry groves. 38° 40' 25" N.: 16° 33' 5" E.

P. Di STALETTI

- S.W., 0-4 Km., steel girder railway viaduct (12 spans). Landmark—castle with turrets at the Point. Landing place rocky shore. 38° 45' 5" N.: 16° 33' 50" E.

MARINA DI CATANZARO

- S.W., 0-6 Km., railway bridge (475 ft. long) and road bridge (475 ft. long) over River CORACE. 0-4 Km. from shore. Landmark—S. of MARINA DI CATANZARO, a ruin of a large red church. 38° 49' 0" N.: 16° 36' 30" E.

MARINA DI CATANZARO, 38° 49' 20" N.: 16° 36' 45" E., to BARCO VERCILLO, 38° 56' 30" N.: 16° 58' 25" E.

Between these two points the line runs on a low-lying strip of land, about 1-3 Km. from the beach, at the foot of the hills. There are fourteen small bridges over streams. Landmark—imposing ruin of the Tour del CROCCHIO, 13 Km. to S.W. of BARCO VERCILLO. Landings near river mouths.

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AREA "D"—SECTION IV

CAPE DI COLONNE TO CAPE TRIONTO

Vulnerable Points:—

MOUTH OF RIVER NETO (North of COTRONE)

W., 3.2 Km., railway bridge over River NETO. 2.6 Km. from sandy beach. Probably invisible from north. $39^{\circ} 12' 0''$ N.; $17^{\circ} 6' 40''$ E.

P. di ALICE

(a) S.W., 6.7 Km., long railway bridge over River LIPUDA. 0.9 Km. from beach. Landmark—TORRE NUOVA, square ruin, dark red. Landing place at river mouth. $39^{\circ} 21' 0''$ N.; $17^{\circ} 7' 5''$ E.

(b) W.N.W., 5.8 Km., railway bridge over PETROSINO. 0.5 Km. from beach. Landmark—village of CIRO, bearing 210° . $39^{\circ} 24' 40''$ N.; $17^{\circ} 5' 45''$ E.

(c) W.N.W., 7.6 Km., railway bridge over R.S. VENERE. 0.3 Km. from beach. Landmark—village of CIRO, 223° . $39^{\circ} 25' 15''$ N.; $17^{\circ} 4' 35''$ E.

P. FIUMENICA

S.S.W., 1.7 Km., railway bridge, 375 ft. long over River FIUMENICA. 1.5 Km. from coast. Landmark—tover of POLICARETTO near the coast. 1 Km. S.E. of point. Landing place to right of river mouth. Thick vegetation. $39^{\circ} 28' 15''$ N.; $17^{\circ} 1' 0''$ E.

GIACOMO-CALOPEZZATI Station

N.W., 0.8 Km., bridge over River FIUMARELLA. 0.5 Km. from beach. $39^{\circ} 35' 0''$ N.; $16^{\circ} 49' 0''$ E.

CAPE TRIONTO

S., 1.5 Km., bridge over River TRIONTO. 1.5 Km. from shore. Marshes to left of mouth. Probably invisible from east. $39^{\circ} 36' 25''$ N.; $16^{\circ} 45' 40''$ E.

AREA "D"—SECTION V

CAPE TRIONTO TO POINT RONDINELLA (TARANTO)

Vulnerable Points:—

TREBISACCE MARINA

S.W., 2.5 Km., three steel girder bridges over the mouths of the River SARACENO. 1.5 Km. between extreme branches of river. Landmark for the northernmost bridge—chimney of the brickworks at TREBISACCE. For the southernmost—VILLAPIANA tower and woods of IL GIARDINO. Landing place in front of IL GIARDINO, sandy delta. Position of Central bridge $39^{\circ} 50' 40''$ N.; $16^{\circ} 37' 30''$ E.

ROSITO Station

S.S.E., 0.8 Km., steel girder railway bridge (and road immediately behind). 0.6 Km. inland. Landmark—SPILICO tower, round, ruined. Landing to north of mouth, beach with bushes. $39^{\circ} 57' 45''$ N.; $16^{\circ} 37' 30''$ E.

MONTEGIORDANO Station

(a) S., 1.6 Km., bridge. 0.3 Km. inland. $40^{\circ} 1' 40''$ N.; $16^{\circ} 36' 15''$ E.

(b) S., 0.9 Km., bridge. 0.3 Km. inland.

(c) Immediately north of station. Bridge on shore.

(d) N., 1.7 Km., bridge. 0.2 Km. inland. $40^{\circ} 3' 20''$ N.; $16^{\circ} 36' 15''$ E.

MOUTH OF RIVER SINNI

(a) S.W., 4.3 Km., bridge over River NICOLA. 0.3 Km. from beach. $40^{\circ} 6' 50''$ N.;

P. FIUMENICA

S.S.W., 1-7 Km., railway bridge, 375 ft. long over River FIUMENICA. 1-5 Km. from coast. Landmark—tower of POLICARETTO near the coast. 1 Km. S.E. of point. Landing place to right of river mouth. Thick vegetation. $39^{\circ} 28' 15''$ N.; $17^{\circ} 1' 0''$ E.

GIACOMO-CALOPEZZATI Station

N.W., 0-8 Km., bridge over River FIUMARELLA. 0-5 Km. from beach. $39^{\circ} 35' 0''$ N.; $16^{\circ} 49' 0''$ E.

CAPE TRIONTO

S., 1-5 Km., bridge over River TRIONTO. 1-5 Km. from shore. Marshes to left of mouth. Probably invisible from east. $39^{\circ} 36' 25''$ N.; $16^{\circ} 45' 40''$ E.

AREA "D"—SECTION V

CAPE TRIONTO TO POINT RONDINELLA (TARANTO)

Vulnerable Points:—

TREBISACCE MARINA

S.W., 2-5 Km., three steel girder bridges over the mouths of the River SARACENO. 1-5 Km. between extreme branches of river. Landmark for the northernmost bridge—chimney of the brickworks at TREBISACCE. For the southernmost—VILLAPIANA tower and woods of IL GIARDINO. Landing place in front of IL GIARDINO, sandy delta. Position of Central bridge $39^{\circ} 50' 40''$ N.; $16^{\circ} 37' 30''$ E.

ROSITO Station

S.S.E., 0-8 Km., steel girder railway bridge (and road immediately behind). 0-6 Km. inland. Landmark—SPILICO tower, round, ruined. Landing to north of mouth, beach with bushes. $39^{\circ} 57' 45''$ N.; $16^{\circ} 37' 30''$ E.

MONTEGIORDANO Station

- (a) S., 1-6 Km., bridge. 0-3 Km. inland. $40^{\circ} 1' 40''$ N.; $16^{\circ} 36' 15''$ E.
- (b) S., 0-9 Km., bridge. 0-3 Km. inland.
- (c) Immediately north of station. Bridge on shore.
- (d) N., 1-7 Km., bridge. 0-2 Km. inland. $40^{\circ} 3' 20''$ N.; $16^{\circ} 36' 15''$ E.

MOUTH OF RIVER SINNI

- (a) S.W., 4-3 Km., bridge over River NICOLA. 0-3 Km. from beach. $40^{\circ} 6' 50''$ N.; $16^{\circ} 38' 0''$ E.
- (b) N.W., 2-2 Km., bridge over River SINNI. Visibility uncertain. $40^{\circ} 9' 0''$ N.; $16^{\circ} 40' 0''$ E.

MOUTH OF RIVER AGRI

N.W., 4-1 Km., steel girder bridge with three spans over River AGRI. Landmark—the low houses of POLICORO to south, with an avenue of eucalyptus, and MOSSA tower, 1-7 Km. to west of mouth. Landing to right of mouth. $40^{\circ} 13' 40''$ N.; $16^{\circ} 41' 30''$ E.

METAPONTO Station

- (a) S.W., 1-6 Km., long bridge. 2-5 Km. inland over River BASENTO. Landmark—the station buildings. Landing north of river mouth (165° from station) marshy meadows. $40^{\circ} 21' 25''$ N.; $16^{\circ} 48' 10''$ E.
- (b) N.E., 4-0 Km., bridge over River BRADANO. 1-3 Km. inland. Possibly difficult to see because of woods. $40^{\circ} 23' 30''$ N.; $16^{\circ} 50' 40''$ E.

POINT RONDINELLA

N., 16-5 Km., bridge over River LATO, close to shore. Landmark—LATO tower (not ruined) surrounded by woods. Landing at mouth, beach, woods. $40^{\circ} 29' 40''$ N.; $16^{\circ} 59' 30''$ E.

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AREA "E"—ADRIATIC COAST OF ITALY, SOUTH OF PESCARA

The main coastal railway from northern Italy to BARI, BRINDISI and TARANTO is joined at PESCARA by the principal transpeninsular railway from ROME, and at FOGGIA by a similar line from NAPLES. An alternative route, circuitous and considerably less important, also joins the main coastal railway at TERMOLI.

Between PESCARA and the LESINA Lagoon, and between BARLETTA and MONOPOLI the railway runs close to the shore. The line is single track except between S. SEVERO and FOGGIA (an inland section) and between BARLETTA and BARI, and is worked by steam locomotives throughout.

The greatest dislocation to traffic would be caused by interruption of the section BARLETTA to BARI. Interruption here, combined with dislocation to the west coast railway in the SALERNO area, would leave only one minor railway connection available between NAPLES, northern ITALY and the ports of BARI, BRINDISI, TARANTO and REGGIO.

The exact position (to the nearest five seconds only) is stated in each case for the railway bridges and not for the road bridges.

AREA "E"—SECTION I

BRINDISI TO BARI

Vulnerable Points:—

MONOPOLI Station

- (a) S.S.E., 4.0 Km., railway bridge over torrent, road bridge immediately behind. Wooded. 1.5 Km. from coast. $40^{\circ} 55' 25''$ N.: $17^{\circ} 19' 10''$ E.
- (b) S. (adjoining station), road bridge and railway bridge (immediately behind). 0.8 Km. from coast. $40^{\circ} 57' 5''$ N.: $17^{\circ} 17' 50''$ E.

POLIGNANO A MARE Station

- (a) S.E., 4 Km., railway bridge. 1.0 Km. from coast. Wooded. Road bridge 0.7 Km. from coast. $40^{\circ} 58' 10''$ N.: $17^{\circ} 15' 30''$ E.
- (b) N.W., 2 Km., road and railway bridge, 0.7 Km. from coast. $41^{\circ} 0' 0''$ N.: $17^{\circ} 11' 55''$ E.
- (c) N.W., 2.3 Km., bridge over road and torrent. 0.7 Km. from shore. Woods. $41^{\circ} 0' 5''$ N.: $17^{\circ} 11' 45''$ E.
- (d) Group of four bridges: 1st bridge, W.N.W., 2.7 Km. 4th bridge, 3.4 Km. 1.5 Km. from coast. Road bridge 0.6 Km. from coast. $41^{\circ} 0' 15''$ N.: 1st bridge, $17^{\circ} 11' 50''$ E.: 2nd bridge, $17^{\circ} 11' 5''$ E.

MOLA DI BARI Station

- (a) S.E., 4.6 Km., railway bridge over road and torrent 0.8 Km. from shore. Woods. $41^{\circ} 2' 10''$ N.: $17^{\circ} 7' 40''$ E.
- There is also another similar bridge 0.6 Km. away from the above to the S.E.
- (b) W.N.W., 76 Km. (immediately east of NOICATTARO Station), railway bridge over road and torrent LA LAMA. 0.8 from coast. Road between railway and coast. $41^{\circ} 4' 50''$ N.: $16^{\circ} 59' 55''$ E.
- (c) W.N.W., 11.4 Km., railway bridge over Torrent S. GIORGIO, also over secondary road. The bridge has four arches. (Shelled by Austrian torpedo boat, 1915.) 0.5 Km. from shore. This is not wooded. $41^{\circ} 5' 30''$ N.: $16^{\circ} 57' 25''$ E.

AREA "E"—SECTION I

BRINDISI TO BARI

Vulnerable Points:—

MONOPOLI Station

- (a) S.S.E., 4.0 Km., railway bridge over torrent, road bridge immediately behind. Wooded. 1.5 Km. from coast. 40° 55' 25" N.; 17° 19' 10" E.
- (b) S. (adjoining station), road bridge and railway bridge (immediately behind). 0.8 Km. from coast. 40° 57' 5" N.; 17° 17' 50" E.

POLIGNANO A MARE Station

- (a) S.E., 4 Km., railway bridge. 1.0 Km. from coast. Wooded. Road bridge 0.7 Km. from coast. 40° 58' 10" N.; 17° 15' 30" E.
- (b) N.W., 2 Km., road and railway bridge. 0.7 Km. from coast. 41° 0' 0" N.; 17° 11' 55" E.
- (c) N.W., 2.3 Km., bridge over road and torrent. 0.7 Km. from shore. Woods. 41° 0' 5" N.; 17° 11' 45" E.
- (d) Group of four bridges: 1st bridge, W.N.W., 2.7 Km. 4th bridge, 3.4 Km. 1.5 Km. from coast. Road bridge 0.6 Km. from coast. 41° 0' 15" N.; 1st bridge, 17° 11' 50" E.; 2nd bridge, 17° 11' 5" E.

MOLA DI BARI Station

- (a) S.E., 4.6 Km., railway bridge over road and torrent 0.8 Km. from shore. Woods. 41° 2' 10" N.; 17° 7' 40" E.
- (b) W.N.W., 76 Km. (immediately east of NOICATTARO Station), railway bridge over road and torrent LA LAMA. 0.8 from coast. Road between railway and coast. 41° 4' 50" N.; 16° 59' 55" E.
- (c) W.N.W., 11.4 Km., railway bridge over Torrent S. GIORGIO, also over secondary road. The bridge has four arches. (Shelled by Austrian torpedo boat, 1915.) 0.5 Km. from shore. This is not wooded. 41° 5' 30" N.; 16° 57' 25" E.

AREA "E"—SECTION II

BARI TO MOUTH OF RIVER OFANTO

Vulnerable Points:—

S. SPIRITO Station

- S.E., 5.5 Km., tram bridge, road bridge and railway bridge all over Torrent. Railway bridge, 0.6 Km. from coast. Some woods. 41° 8' 10" N.; 16° 48' 20" E.

GIOVINAZZO Station

- (a) E.S.E., 0.9 Km., road bridge and railway bridge (behind) over LAMA CASTELLA, possibly hidden by buildings. 0.5 Km. from coast. 40° 10' 40" N.; 16° 40' 55" E.
- (b) W.N.W., 5.4 Km. Bridge over the CUPA torrent. 0.8 Km. from shore. 41° 11' 35" N.; 16° 36' 30" E.

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BISCEGLIE Station

W.N.W., 3.3 Km., road bridge and railway bridge over LAMA PATENO. 0.7 Km. from cliff. $41^{\circ} 14' 55''$ N.; $16^{\circ} 28' 0''$ E.

TRANI Station

S.E., 1.7 Km., railway bridge over road. Buildings 0.6 Km. from coast, immediately S. of C. COLONNA. $41^{\circ} 15' 45''$ N.; $16^{\circ} 26' 5''$ E.

MOUTH OF RIVER OFANTO

(a) S.W., 3.8 Km., road bridge and railway bridge over River OFANTO. 3.3 Km. from beach. Woods. $41^{\circ} 19' 45''$ N.; $16^{\circ} 11' 40''$ E.

(b) W.S.W., 5.8 Km., steel girder railway bridge over Contr' OFANTO (Canal). 3.2 Km. from beach. $41^{\circ} 20' 25''$ N.; $16^{\circ} 9' 15''$ E.

(c) W., 8.6 Km. Bridge over OFANTINO. 4.6 Km. from shore. Some trees. $41^{\circ} 20' 45''$ N.; $16^{\circ} 6' 55''$ E.

Sites recognisable by salt-works of MARGHERITA DI SAOVOJA, with private branch line from main railway.

AREA "E"—SECTION III

POINT PIETRE NERE TO POINT DELLA PENNA

Vulnerable Points:—

P. PIETRE NERE

W.S.W., 6.6 Km., bridge over River FORTORE. 3.0 Km. from mouth of river. 2.2 Km. from shore to north. Small hill immediately west of bridge. Landing place to right of river mouth. $41^{\circ} 53' 55''$ N.; $15^{\circ} 16' 0''$ E.

CHIEUTI Station

W., 1.6 Km., bridge over River SACCIONE. 0.2 Km. from beach. $41^{\circ} 55' 30''$ N.; $15^{\circ} 8' 20''$ E.

COMPOMARINO Station

(a) S.E., 3.9 Km., railway bridge over CANNE Torrent. 0.3 Km. from beach. $41^{\circ} 56' 20''$ N.; $15^{\circ} 4' 50''$ E.

(b) S.E., 2.4 Km., bridge over MIGLIA Torrent. 0.5 Km. from beach. $41^{\circ} 56' 35''$ N.; $15^{\circ} 3' 50''$ E.

(c) S.E., 1.4 Km., railway bridge over GIARDINI Torrent. 0.7 Km. from beach. $41^{\circ} 56' 55''$ N.; $15^{\circ} 3' 20''$ E.

(d) N.W., 1.3 Km., large bridge over River BIFURNO. 2.0 Km. inland, marshy delta. Trees on east bank. $41^{\circ} 47' 45''$ N.; $15^{\circ} 1' 40''$ E.

TERMOLI (Headland)

(a) S., 1.9 Km., bridge over stream. 0.2 Km. from beach. $41^{\circ} 59' 25''$ N.; $15^{\circ} 0' 0''$ E.

(b) S., 1.2 Km., bridge over RIOVIVO Stream. 0.2 Km. from coast. $41^{\circ} 59' 45''$ N.; $14^{\circ} 59' 50''$ E.

(c) W., 3.0 Km., bridge over River SINARCA. 0.3 Km. from beach. $42^{\circ} 0' 30''$ N.; $14^{\circ} 57' 40''$ E.

MOUTH OF RIVER TRIGNO

(a) S.E., 4.8 Km., railway bridge and road bridge. 0.2 Km. behind over TECCHIO Torrent. 0.3 Km. from shore and 0.4 Km. north-west of MONTENERO Station. $42^{\circ} 2' 0''$ N.; $14^{\circ} 50' 15''$ E.

AREA "E"—SECTION III

POINT PIETRE NERE TO POINT DELLA PENNA

Vulnerable Points:—

P. PIETRE NERE

W.S.W., 6.6 Km., bridge over River FORTORE. 3.0 Km. from mouth of river. 2.2 Km. from shore to north. Small hill immediately west of bridge. Landing place to right of river mouth. $41^{\circ} 53' 55''$ N.: $15^{\circ} 16' 0''$ E.

CHIEUTI Station

W., 1.6 Km., bridge over River SACCIONE. 0.2 Km. from beach. $41^{\circ} 55' 30''$ N.: $15^{\circ} 8' 20''$ E.

COMPOMARINO Station

(a) S.E., 3.9 Km., railway bridge over CANNE Torrent. 0.3 Km. from beach. $41^{\circ} 56' 20''$ N.: $15^{\circ} 4' 50''$ E.

(b) S.E., 2.4 Km., bridge over MIGLIA Torrent. 0.5 Km. from beach. $41^{\circ} 56' 35''$ N.: $15^{\circ} 3' 50''$ E.

(c) S.E., 1.4 Km., railway bridge over GIARDINI Torrent. 0.7 Km. from beach. $41^{\circ} 56' 55''$ N.: $15^{\circ} 3' 20''$ E.

(d) N.W., 1.3 Km., large bridge over River BIFURNO. 2.0 Km. inland, marshy delta. Trees on east bank. $41^{\circ} 47' 45''$ N.: $15^{\circ} 1' 40''$ E.

TERMOLI (Headland)

(a) S., 1.9 Km., bridge over stream. 0.2 Km. from beach. $41^{\circ} 59' 25''$ N.: $15^{\circ} 0' 0''$ E.

(b) S., 1.2 Km., bridge over RIOVIVO Stream. 0.2 Km. from coast. $41^{\circ} 59' 45''$ N.: $14^{\circ} 59' 50''$ E.

(c) W., 3.0 Km., bridge over River SINARCA. 0.3 Km. from beach. $42^{\circ} 0' 30''$ N.: $14^{\circ} 57' 40''$ E.

MOUTH OF RIVER TRIGNO

(a) S.E., 4.8 Km., railway bridge and road bridge. 0.2 Km. behind over TECCHIO Torrent. 0.3 Km. from shore and 0.4 Km. north-west of MONTENERO Station. $42^{\circ} 2' 0''$ N.: $14^{\circ} 50' 45''$ E.

(b) S.E., 3.0 Km., bridge over MERGOLO stream. 0.5 Km. from coast. $42^{\circ} 2' 30''$ N.: $14^{\circ} 49' 30''$ E.

(c) S.W., 1.5 Km., long bridge over River TRIGNO. 1.5 Km. from river mouth. $42^{\circ} 3' 15''$ N.: $14^{\circ} 47' 40''$ E.

(d) N.W., 1.8 Km., bridge over northern distributary of TRINGO delta. 0.8 Km. from coast and immediately east of S. SALVO Station. $42^{\circ} 3' 45''$ N.: $14^{\circ} 46' 25''$ E.

(e) N.W., 4.4 Km., railway bridge over road and BUONANOTTE stream. 0.5 Km. from coast. 2.1 Km., north-east of S. SALVO Station. $42^{\circ} 4' 25''$ N.: $14^{\circ} 44' 55''$ E.

Between these five bridges and the sea there runs an open trackway for cattle.

VASTO Station

(a) S., 0.4 Km., railway bridge over stream DEL Pte. MARINO. 0.2 Km. from shore. $42^{\circ} 5' 50''$ N.: $14^{\circ} 43' 15''$ E.

(b) N., 1.8 Km., bridge over stream, 0.1 Km. from shore. $42^{\circ} 7' 0''$ N.: $14^{\circ} 43' 15''$ E.

(c) N., 3.4 Km., bridge over stream. 0.1 Km. from shore. $42^{\circ} 7' 50''$ N.: $14^{\circ} 43' 5''$ E.

AREA "E"—SECTION III

POINT PIETRE NERE TO POINT DELLA PENNA

Vulnerable Points:—

P. PIETRE NERE

W.S.W., 6.6 Km., bridge over River FORTORE. 3.0 Km. from mouth of river. 2.2 Km. from shore to north. Small hill immediately west of bridge. Landing place to right of river mouth. $41^{\circ} 53' 55''$ N.; $15^{\circ} 16' 0''$ E.

CHIEUTI Station

W., 1.6 Km., bridge over River SACCIONE. 0.2 Km. from beach. $41^{\circ} 55' 30''$ N.; $15^{\circ} 8' 20''$ E.

COMPOMARINO Station

(a) S.E., 3.9 Km., railway bridge over CANNE Torrent. 0.3 Km. from beach. $41^{\circ} 56' 20''$ N.; $15^{\circ} 4' 50''$ E.

(b) S.E., 2.4 Km., bridge over MIGLIA Torrent. 0.5 Km. from beach. $41^{\circ} 56' 35''$ N.; $15^{\circ} 3' 50''$ E.

(c) S.E., 1.4 Km., railway bridge over GIARDINI Torrent. 0.7 Km. from beach. $41^{\circ} 56' 55''$ N.; $15^{\circ} 3' 20''$ E.

(d) N.W., 1.3 Km., large bridge over River BIFURNO. 2.0 Km. inland, marshy delta. Trees on east bank. $41^{\circ} 47' 45''$ N.; $15^{\circ} 1' 40''$ E.

TERMOLI (Headland)

(a) S., 1.9 Km., bridge over stream. 0.2 Km. from beach. $41^{\circ} 59' 25''$ N.; $15^{\circ} 0' 0''$ E.

(b) S., 1.2 Km., bridge over RIOVIVO Stream. 0.2 Km. from coast. $41^{\circ} 59' 45''$ N.; $14^{\circ} 59' 50''$ E.

(c) W., 3.0 Km., bridge over River SINARCA. 0.3 Km. from beach. $42^{\circ} 0' 30''$ N.; $14^{\circ} 57' 40''$ E.

MOUTH OF RIVER TRIGNO

(a) S.E., 4.8 Km., railway bridge and road bridge. 0.2 Km. behind over TECCHIO Torrent. 0.3 Km. from shore and 0.4 Km. north-west of MONTENERO Station. $42^{\circ} 2' 0''$ N.; $14^{\circ} 50' 45''$ E.

(b) S.E., 3.0 Km., bridge over MERGOLO stream. 0.5 Km. from coast. $42^{\circ} 2' 30''$ N.; $14^{\circ} 49' 30''$ E.

(c) S.W., 1.5 Km., long bridge over River TRIGNO. 1.5 Km. from river mouth. $42^{\circ} 3' 15''$ N.; $14^{\circ} 47' 40''$ E.

(d) N.W., 1.8 Km., bridge over northern distributary of TRINGO delta. 0.8 Km. from coast and immediately east of S. SALVO Station. $42^{\circ} 3' 45''$ N.; $14^{\circ} 46' 25''$ E.

(e) N.W., 4.4 Km., railway bridge over road and BUONANOTTE stream. 0.5 Km. from coast. 2.1 Km., north-east of S. SALVO Station. $42^{\circ} 4' 25''$ N.; $14^{\circ} 44' 55''$ E.

Between these five bridges and the sea there runs an open trackway for cattle.

VASTO Station

(a) S., 0.4 Km., railway bridge over stream DEL Pte. MARINO. 0.2 Km. from shore. $42^{\circ} 5' 50''$ N.; $14^{\circ} 43' 15''$ E.

(b) N., 1.8 Km., bridge over stream, 0.1 Km. from shore. $42^{\circ} 7' 0''$ N.; $14^{\circ} 43' 15''$ E.

(c) N., 3.4 Km., bridge over stream. 0.1 Km. from shore. $42^{\circ} 7' 50''$ N.; $14^{\circ} 43' 5''$ E.

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AREA "E"—SECTION IV

POINT DELLA PENNA TO MOUTH OF RIVER VOMANO

Vulnerable Points:—

POINT DELLA PENNA

- (a) N.W., 5.9 Km., bridge over River SINELLO. 0.1 Km. from beach. 42° 11' 25" N.; 14° 38' 45" E.
- (b) N.W., 9.7 Km., bridge over OSENTA River. Close to coast. 42° 12' 5" N.; 14° 36' 20" E.

POINT DI CAVULLUCCIO

- (a) S.E., 5.1 Km., long bridge (three spans) over River SANGRO. 0.4 Km. from beach. 42° 14' 10" N.; 14° 32' 25" E.
- (b) S., 1.5 Km., bridge over FOSSACESIA Torrent on coast 42° 15' 30" N.; 14° 30' 0" E.
- (c) N.W., 1.1 Km., bridge over stream on coast. 42° 16' 40" N.; 14° 29' 30" E.

ORTONA Station

- (a) S.E., 6.0 Km., bridge over FELTRINO. 0.2 Km. from coast. 0.5 Km. north of S. VITO Station. 42° 18' 30" N.; 14° 26' 40" E.
- (b) S.E., 3.2 Km. bridge over MORO ravine and river. Close to shore. 42° 19' 45" N.; 14° 25' 30" E.
- (c) N.W., 1.1 Km., bridge over stream on coast. 42° 21' 45" N.; 14° 23' 55" E.
- (d) N.W., 3.8 Km., bridge over stream at exit from short tunnel. 0.2 Km. from coast. 42° 22' 40" N.; 14° 22' 0" E.
- (e) N.W., 5.2 Km., railway bridge and road bridge (immediately inland) over River ARIELLI on coast. 42° 23' 10" N.; 14° 21' 30" E.
- (f) N.W., 8.3 Km., railway bridge and road bridge (immediately inland) over River FORO. 0.3 Km. from shore. 42° 24' 0" N.; 14° 19' 35" E.

FRANCAVILLA AL MARE Station

- N.W., 1.1 Km., railway bridge and road bridge (immediately behind) over River ALENTO, 0.4 Km. from shore. 42° 25' 30" N.; 14° 16' 45" E.

MOUTH OF PESCARA

- (a) S.E., 2.5 Km., railway and road bridges over Valle LUNGA stream. 0.4 Km. from beach. 42° 26' 50" N.; 14° 14' 40" E.
- (b) Steel girder railway bridge over River PESCARA. 1.4 Km. from mouth. Also immediately to the south there is a railway bridge over road. Road bridge over River PESCARA. 1.0 Km. from mouth. All bridges in town. 42° 27' 35" N.; 14° 12' 35" E.

SALINE River mouth

- (a) S.E., 5.1 Km., long bridge (three spans) over River SANGRO. 0.4 Km. from beach. 42° 14' 10" N.; 14° 32' 25" E.
- (b) S., 1.5 Km., bridge over FOSSACESIA Torrent on coast 42° 15' 30" N.; 14° 30' 0" E.
- (c) N.W., 1.1 Km., bridge over stream on coast. 42° 16' 40" N.; 14° 29' 30" E.

ORTONA Station

- (a) S.E., 6.0 Km., bridge over FELTRINO. 0.2 Km. from coast. 0.5 Km. north of S. VITO Station. 42° 18' 30" N.; 14° 26' 40" E.
- (b) S.E., 3.2 Km., bridge over MORO ravine and river. Close to shore. 42° 19' 45" N.; 14° 25' 30" E.
- (c) N.W., 1.1 Km., bridge over stream on coast. 42° 21' 45" N.; 14° 23' 55" E.
- (d) N.W., 3.8 Km., bridge over stream at exit from short tunnel. 0.2 Km. from coast. 42° 22' 40" N.; 14° 22' 0" E.
- (e) N.W., 5.2 Km., railway bridge and road bridge (immediately inland) over River ARIELLI on coast. 42° 23' 10" N.; 14° 21' 30" E.
- (f) N.W., 8.3 Km., railway bridge and road bridge (immediately inland) over River FORO. 0.3 Km. from shore. 42° 24' 0" N.; 14° 19' 35" E.

FRANCAVILLA AL MARE Station

- N.W., 1.1 Km., railway bridge and road bridge (immediately behind) over River ALENTO, 0.4 Km. from shore. 42° 25' 30" N.; 14° 16' 45" E.

MOUTH OF PESCARA

- (a) S.E., 2.5 Km., railway and road bridges over Valle LUNGA stream. 0.4 Km. from beach. 42° 26' 50" N.; 14° 14' 40" E.
- (b) Steel girder railway bridge over River PESCARA. 1.4 Km. from mouth. Also immediately to the south there is a railway bridge over road. Road bridge over River PESCARA. 1.0 Km. from mouth. All bridges in town. 42° 27' 35" N.; 14° 12' 35" E.

SALINE River mouth

- (a) S.W., 0.9 Km., railway bridge and road bridge (immediately inland) over river. 0.9 Km. from beach. 42° 31' 15" N.; 14° 8' 40" E.
- (b) W.N.W., 1.9 Km., railway bridge and road bridge (immediately behind) over PIOMBA Torrent. 0.5 Km. from beach. 42° 31' 50" N.; 14° 8' 0" E.

RIVER VOMANO

- Long railway bridge and road bridge (immediately behind) over river mouth. 0.7 Km. from mouth. 42° 39' 5" N.; 14° 1' 55" E.

SECTION IV (3) 29

AREA "F"—PESCARA TO RIMINI

All railway bridges mentioned in the text are on the main line along the Adriatic coast from Southern to Northern Italy. Between ANCONA and RIMINI the railway is double track. Interruption to any section of the railway between PESCARA and RIMINI would cause great inconvenience since there is no satisfactory alternative route for through traffic except by FLORENCE and ROME.

All road bridges mentioned are on the main road along the Adriatic coast from Southern to Northern Italy. Between PESCARA and ANCONA there is a comparatively good but hilly alternative route via ASCOLI. Interruption to traffic between ANCONA and RIMINI would be much more serious as there are only extremely circuitous and hilly alternative routes.

AREA "F"—SECTION I

PESCARA TO ANCONA

For bridges over Rs. PESCARA, SALINE and PIOMBA, see Area "E."

Marina di SILVI (Station)

N.N.W. 1.7 Km. Railway bridge and road bridge adjoining torrent CERRANO. 100 m. from beach. Lat. $42^{\circ} 34' 25''$ N.; Long. $14^{\circ} 6' 5''$ E.

ATRI-PINETO (Station)

N.N.W. 0.6 Km. Railway bridge and road bridge over torrent CALVANO. Railway bridge near beach; road bridge 300 metres inland. Lat. $42^{\circ} 36' 50''$ N.; Long. $14^{\circ} 3' 55''$ E.

For bridge over R. VOMANO, see Area "E."

Mouth of R. TARDINO

S.S.E. 0.8 Km. Long railway bridge and road bridge over river. Lat. $42^{\circ} 44' 15''$ N.; Long. $13^{\circ} 58' 35''$ E. Landing—beaches north and south of mouths.

Mouth of R. SALINELLO

S.E. 0.6 Km. Railway bridge and road bridge adjoining over river. Lat. $42^{\circ} 46' 50''$ N.; Long. $13^{\circ} 57' 0''$ E. Landing—beach (? sand-dunes) north of river mouth.

Mouth of Torrent of VIBRATA

W. 1.1 Km. Road and railway bridge over river. Lat. $42^{\circ} 50' 20''$ N.; Long. $13^{\circ} 55' 55''$ E. Landing—beach at south of mouth of river.

Mouth of R. TRONTO

(a) W. 1.7 Km. Railway bridge and road bridge. Railway bridge 1.7 Km. and road bridge 2.1 Km. from shore. Lat. $42^{\circ} 53' 40''$ N.; Long. $13^{\circ} 54' 5''$ E. Landing—beach south of river mouth.

AREA "F"—SECTION I

PESCARA TO ANCONA

For bridges over R. PESCARA, SALINE and PIOMBA, see Area "E."

Marina di SILVI (Station)

N.N.W. 1.7 Km. Railway bridge and road bridge adjoining torrent CERRANO. 100 m. from beach. Lat. $42^{\circ} 34' 25''$ N.; Long. $14^{\circ} 6' 5''$ E.

ATRI-PINETO (Station)

N.N.W. 0.6 Km. Railway bridge and road bridge over torrent CALVANO. Railway bridge near beach; road bridge 300 metres inland. Lat. $42^{\circ} 36' 50''$ N.; Long. $14^{\circ} 3' 55''$ E.

For bridge over R. VOMANO, see Area "E."

Mouth of R. TARDINO

S.S.E. 0.8 Km. Long railway bridge and road bridge over river. Lat. $42^{\circ} 44' 15''$ N.; Long. $13^{\circ} 58' 35''$ E. Landing—beaches north and south of mouths.

Mouth of R. SALINELLO

S.E. 0.6 Km. Railway bridge and road bridge adjoining over river. Lat. $42^{\circ} 46' 50''$ N.; Long. $13^{\circ} 57' 0''$ E. Landing—beach (? sand-dunes) north of river mouth.

Mouth of Torrent of VIBRATA

W. 1.1 Km. Road and railway bridge over river. Lat. $42^{\circ} 50' 20''$ N.; Long. $13^{\circ} 55' 55''$ E. Landing—beach at south of mouth of river.

Mouth of R. TRONTO

(a) W. 1.7 Km. Railway bridge and road bridge. Railway bridge 1.7 Km. and road bridge 2.1 Km. from shore. Lat. $42^{\circ} 53' 40''$ N.; Long. $13^{\circ} 54' 5''$ E. Landing—beach south of river mouth.

(b) N.N.W. 4.2 Km. Railway bridge over torrent RAGNOLA. 200 m. from beach. Lat. $42^{\circ} 55' 40''$ N.; Long. $13^{\circ} 53' 50''$ E. Landing—on beach.

Mouth of R. TESINO

W. 0.2 Km. Railway bridge and road bridge over river. Road bridge 0.4 Km. inland. Lat. $42^{\circ} 58' 45''$ N.; Long. $13^{\circ} 52' 35''$ E. Landing—beaches at river mouth.

PEDASO (Station)

(a) S. 6 Km. Railway bridge and road bridge over torrent MENOCCHIA. Railway bridge 100 m. and road bridge 400 m. inland. Lat. $43^{\circ} 2' 45''$ N.; Long. $13^{\circ} 51' 30''$ E.

(b) N.N.W. 1.1 Km. railway bridge and road bridge over R. ASO. Railway bridge 200 m., and road bridge 600 m., from mouth of river. Lat. $43^{\circ} 6' 15''$ N.; Long. $13^{\circ} 50' 40''$ E.

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Porto GEORGIO (Station)

(a) S.S.E. 2 Km. Railway bridge and road bridge over R. ETE VIVO. Railway bridge 400 m. and road bridge 700 m. from mouth of river. Lat. $43^{\circ} 9' 40''$ N.; Long. $13^{\circ} 48' 30''$ E. Landing—beaches at mouth of river.

(b) N.N.W. of 6.2 Km. Railway bridge and road bridge adjoining, over R. TENNA 500 m. from mouth of river. Lat. $43^{\circ} 13' 55''$ N.; Long. $13^{\circ} 46' 30''$ E. Landing—at mouth of river.

Mouth of R. CHIENZI

S.W. 0.8 Km. Railway bridge and road bridge over river. Road bridge 1.2 Km. from river mouth. Lat. $43^{\circ} 17' 30''$ N.; Long. $13^{\circ} 44' 30''$ E. Landing—beach south of river mouth.

POTENZA-PICENA Station

S.S.E. 1.3 Km. Railway bridge and road bridge adjoining, over R. ASOLA. 100 m. from mouth of river. Lat. $43^{\circ} 20' 65''$ N.; Long. $13^{\circ} 42' 10''$ E. Landing—beaches at river mouth.

Mouth of R. POTENZA

S.W. 0.8 Km. Road bridge and railway bridge. Road bridge 400 m. from river mouth. Lat. $43^{\circ} 25' 25''$ N.; Long. $13^{\circ} 39' 53''$ E.

AREA "F"—SECTION II

ANCONA TO RIMINI

Mouth of R. ESINO

S.W. 0.6 Km. Brick (terraccotta) railway bridges and road bridges over river. Road bridge 0.8 Km. from river mouth. Lat. $43^{\circ} 38' 30''$ N.; Long. $13^{\circ} 22' 20''$ E. Landing—beaches at mouth of river.

SENIGALLIA (Station)

- (a) Railway bridge in town over canal near beach. Lat. $43^{\circ} 43' 0''$ N.; Long. $13^{\circ} 13' 20''$ E.
- (b) N.W. 5.3 Km. Railway bridge and road bridge adjoining, over R. CESANO. 300 m. from beach. Lat. $43^{\circ} 44' 55''$ N.; Long. $13^{\circ} 10' 30''$ E.

FANO Station

- (a) S.E. 2.8 Km. Long brick (terraccotta) railway bridge and road bridge adjacent, over R. METAURO. 300 m. from beach. Lat. $43^{\circ} 49' 45''$ N.; Long. $13^{\circ} 3' 25''$ E.
- (b) N.W. 1.6 Km. Railway bridge over Torrent ARZILIA at north end of town. Lat. $43^{\circ} 51' 10''$ N.; Long. $13^{\circ} 0' 40''$ E.

S.S.E. 1.3 Km. Railway bridge and road bridge adjoining, over R. ASOLA. 100 m. from mouth of river. Lat. $43^{\circ} 20' 65''$ N.; Long. $13^{\circ} 42' 10''$ E. Landing—beaches at river mouth.

Mouth of R. POTENZA

S.W. 0.8 Km. Road bridge and railway bridge. Road bridge 400 m. from river mouth. Lat. $43^{\circ} 25' 25''$ N.; Long. $13^{\circ} 39' 53''$ E.

AREA "F"—SECTION II

ANCONA TO RIMINI

Mouth of R. ESINO

S.W. 0.6 Km. Brick (terracotta) railway bridges and road bridges over river. Road bridge 0.8 Km. from river mouth. Lat. $43^{\circ} 38' 30''$ N.; Long. $13^{\circ} 22' 20''$ E. Landing—beaches at mouth of river.

SENIGALLIA (Station)

- (a) Railway bridge in town over canal near beach. Lat. $43^{\circ} 43' 0''$ N.; Long. $13^{\circ} 13' 20''$ E.
- (b) N.W. 5.3 Km. Railway bridge and road bridge adjoining, over R. CESANO. 300 m. from beach. Lat. $43^{\circ} 44' 55''$ N.; Long. $13^{\circ} 10' 30''$ E.

FANO Station

- (a) S.E. 2.8 Km. Long brick (terracotta) railway bridge and road bridge adjacent, over R. METAURO. 300 m. from beach. Lat. $43^{\circ} 49' 45''$ N.; Long. $13^{\circ} 3' 25''$ E.
- (b) N.W. 1.6 Km. Railway bridge over Torrent ARZILIA at north end of town. Lat. $43^{\circ} 51' 10''$ N.; Long. $13^{\circ} 0' 40''$ E.

Mouth of Torrent CONCA

- (a) S.E. 1 Km. Railway bridge over R. VENLENA. 450 m. from beach. Lat. $43^{\circ} 58' 0''$ N.; Long. $12^{\circ} 43' 40''$.
- (b) S. 0.6 Km. Railway bridge over river. Lat. $43^{\circ} 58' 10''$ N.; Long. $12^{\circ} 43' 0''$ E. Landing—north of river mouth.

RIMINI (Mole)

S.S.W. 1.2 Km. Railway bridge over R. MARECCHIA. 1.1 Km. from river mouth. Lat. $44^{\circ} 3' 55''$ N.; $12^{\circ} 34' 10''$ E. Landing—mole or sands west of river mouth.

SECTION IV (3) 31

ROADS OF SOUTHERN ITALY AND THEIR VULNERABILITY

Between NAPLES, SALERNO and BATTIPAGLIA there is only one direct road, the alternative being very circuitous. Between BATTIPAGLIA and COSENZA or NICASTRO or CATANZARO there is a choice of two routes, one inland, the other largely following the coast. Between COSENZA, NICASTRO or CATANZARO and REGGIO there are only two possible routes:—

- (i) The direct route along the west coast, or
- (ii) the circuitous route along the east coast.

These two coastal roads are joined together by only a limited number of trans-peninsular roads:—

- (i) NICASTRO to CATANZARO to MARINA DI CATANZARO. State road.
- (ii) FRANCAVILLA-ANGITOLA (west coast) to SOVERATO (east coast) by provincial road or to SERRA S. BRUNO (*see* (iii) below) and to MARINA DI MONASTERACE (east coast). State road.
- (iii) VIBO VALENTIA (W.) to GIOIOSA MARINA (east coast) with connections to SERRA S. BRUNO ((ii) above) and to CITTANOVA (*see* (iv) below). This is only a provincial road with very steep gradients.
- (iv) GJOIA (west coast) to CITTANOVA (*see* (iii) above) to GERACE MARINA (LOCRI MARINA) (east coast). State road.
- (v) BAGNARA (west coast) to BOVALINA MARINA (east coast). State road.

There is no continuous route away from the coast linking the transverse routes and those sections which do exist are extremely circuitous and heavily graded. Interruption to either of the two coastal roads between any of the terminal points mentioned above would virtually mean the transference of through traffic from one coastal route to the other by one of the transverse routes. Complete interruption to traffic can, therefore, only be achieved by putting both coastal roads out of action at points situated between two neighbouring trans-peninsular roads, and particularly between (a) NICASTRO and VIBO VALENTIA (W.) and CATANZARO and SOVERATO (E.), and (b) GIOIA and BAGNARA (W.) and LOCRI (GERACE) and BOVALINO (N.).

Road traffic from TARANTO and the heel of Italy to REGGIO and the toe has in effect to pass through COSENZA, so that it is subject to the same potential interruptions in the region S.W. of COSENZA as the traffic from NAPLES, as already described.

The rivers of Southern Italy are subject to great variations of flow and many, which may be considerable streams during the winter months, become mere trickles during the summer months. In the following list of bridges an attempt has been made to enumerate the bridges which may be regarded as of importance for one of the following reasons:—

- (i) Size of bridge.
- (ii) Size of river to be crossed, especially with relation to the minimum flow of the river and possible alternative of fording.
- (iii) Traffic
- (iv) Visibility from the sea.

In each instance the statement of position refers to the road bridge under discussion. Railway bridges are mentioned when they are in close proximity to road bridges. The first bridge (whether road or railway) mentioned is invariably the one nearest the coast.

ROAD BRIDGES

C. SUVERO to SCILLA: Vulnerable Points:—

Note—* indicates the more important bridges.

SERRA S. BRUNO (iii) above) and to CITTANOVA (see (iv) below). This is only a provincial road with very steep gradients.

(iv) GJOIA (west coast) to CITTANOVA (see (iii) above) to GERACE MARINA (LOCRI MARINA) (east coast). State road.

(v) BAGNARA (west coast) to BOVALINA MARINA (east coast). State road.

There is no continuous route away from the coast linking the transverse routes and those sections which do exist are extremely circuitous and heavily graded. Interruption to either of the two coastal roads between any of the terminal points mentioned above would virtually mean the transference of through traffic from one coastal route to the other by one of the transverse routes. Complete interruption to traffic can, therefore, only be achieved by putting both coastal roads out of action at points situated between two neighbouring trans-peninsular roads, and particularly between (a) NICASTRO and VIBO VALENTIA (W.) and CATANZARO and SOVERATO (E.), and (b) GIOIA and BAGNARA (W.) and LOCRI (GERACE) and BOVALINO (N.).

Road traffic from TARANTO and the heel of Italy to REGGIO and the toe has in effect to pass through COSENZA, so that it is subject to the same potential interruptions in the region S.W. of COSENZA as the traffic from NAPLES, as already described.

The rivers of Southern Italy are subject to great variations of flow and many, which may be considerable streams during the winter months, become mere trickles during the summer months. In the following list of bridges an attempt has been made to enumerate the bridges which may be regarded as of importance for one of the following reasons:—

- (i) Size of bridge.
- (ii) Size of river to be crossed, especially with relation to the minimum flow of the river and possible alternative of fording.
- (iii) Traffic
- (iv) Visibility from the sea.

In each instance the statement of position refers to the road bridge under discussion. Railway bridges are mentioned when they are in close proximity to road bridges. The first bridge (whether road or railway) mentioned is invariably the one nearest the coast.

ROAD BRIDGES

C. SUVERO to SCILLA: Vulnerable Points:—

Note.—* indicates the more important bridges.

Bridges on the main road from NAPLES to REGGIO, and from TARANTO to REGGIO, and from CATANZARO to REGGIO.

A.* Mouth of River ANGITOLA

S.E., 1.6 Km., railway bridge and road bridge (nine arches) over River ANGITOLA. Landing on beach north of river mouth. $38^{\circ} 46' 15''$ N.; $16^{\circ} 13' 0''$ E. Railway bridge: $38^{\circ} 46' 20''$ N.; $16^{\circ} 12' 50''$ E.

GIOGA Station

(a) N.E., 1.3 Km., railway bridge and road bridge over BUDELLO Torrent. 1.5 Km. from coast. Trees to the north of river mouth. $38^{\circ} 25' 50''$ N.; $15^{\circ} 54' 35''$ E. Landing on sandy beach north of river mouth.

B.* (b) S.S.W., 1.0 Km., two railway bridges and road bridges (three masonry arches) over River PETRACE. 1.4 Km. from mouth of river. Landing on sandy beach south of mouth. $38^{\circ} 24' 50''$ N.; $15^{\circ} 53' 40''$ E.

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BAGNARA

S.W. end of town, railway bridge and road bridge (masonry and three arches) over SFALASSA torrent. 300 m. from river mouth. $38^{\circ} 16' 45''$ N.; $15^{\circ} 48' 5''$ E.

FAVAZZINA

N.E. end of village, railway bridge and road bridge over River FAVAZZINA. 250 m. from river mouth. $38^{\circ} 15' 40''$ N.; $15^{\circ} 45' 48''$ E.

SCILLA

E.S.E., 2.5 Km., road bridge over mouth of torrent. Railway running in tunnel under torrent. $38^{\circ} 15' 15''$ N.; $15^{\circ} 44' 38''$ E.

SCILLA to C. DELL'ARMI: Vulnerable Points:—

Bridges on the main road from NAPLES-SCILLA-REGGIO and from TARANTO and CATANZARO to SCILLA-REGGIO. There is no alternative route between REGGIO and MELITO DI PORTO SALVO (east of C. DELL'ARMI) except by a very hilly secondary road or by the extremely circuitous route via BOVALINO MARINO.

SCILLA

N.S.E., 3.9 Km., railway bridge and road bridge over River S. TRARA. 250 m. from river mouth. $38^{\circ} 14' 25''$ N.; $15^{\circ} 40' 28''$ E.

• CATONA Station

(a) N., 0.7 Km., road bridge over River CATONA (railway bridge 0.5 Km. from mouth). 0.9 Km. from river mouth. Trees both sides of river mouth. $38^{\circ} 11' 25''$ N.; $15^{\circ} 38' 30''$ E.

(b) S.S.E., 1.6 Km., railway bridge and road bridge over River GALLICO (or GIUSEPPE River). There seems to be a ford close to the road bridge. 1 Km. from river mouth. Railway bridge 0.4 Km. from mouth. $38^{\circ} 10' 20''$ N.; $15^{\circ} 39' 5''$ E.

• REGGIO

N.N.E. of Port. 3.6 Km., railway bridge (200 ft. long) and road bridge immediately behind. 0.4 Km. from river mouth. Trees near mouth. $38^{\circ} 9' 20''$ N.; $15^{\circ} 39' 30''$ E.

C. DELL'ARMI

N.W., 2.4 Km., railway bridge (400 ft. long) and road bridge immediately behind over River DI LAZZARO. Also a ford on the seaward side of the railway bridge. 200 m. from coast. $37^{\circ} 58' 15''$ N.; $15^{\circ} 40' 10''$ E.

C. DELL'ARMI to BOVALINO MARINA: Vulnerable Points:—

Bridges on the main road from REGGIO-BOVALINO MARINA. There is no alternative route between intermediate points.

C. DELL'ARMI

Three bridges—(1) S.E., 1.2 Km.; (2) S.E., 1.8 Km.; (3) S.E., 2.1 Km., over three mouths of River MOLARO. Railway bridges on shore between road bridges and coast. Road bridges about 100 m. from coast. Position of middle bridge, $37^{\circ} 56' 45''$ N.; $15^{\circ} 42' 25''$ E.

MELITO DI PORTO SALVO

(a) N.W., 3.6 Km., railway bridge and road bridge over River ELIA. 0.4 Km. from coast. $37^{\circ} 55' 45''$ N.; $15^{\circ} 44' 35''$ E.

(b) E., 1.1 Km., railway bridge and road bridge adjoining over River MELITO on shore. $37^{\circ} 55' 0''$ N.; $15^{\circ} 47' 40''$ E.

A. BOVA MARINA Station

Three bridges (light arches) and road bridge (immediately

SCILLA

N.S.E., 3.9 Km., railway bridge and road bridge over River S. TRARA. 250 m. from river mouth. 38° 14' 25" N.; 15° 40' 28" E.

* CATONA Station

(a) N., 0.7 Km., road bridge over River CATONA (railway bridge 0.5 Km. from mouth). 0.9 Km. from river mouth. Trees both sides of river mouth. 38° 11' 25" N.; 15° 38' 30" E.

(b) S.S.E., 1.6 Km., railway bridge and road bridge over River GALLICO (or GIUSEPPE River). There seems to be a ford close to the road bridge. 1 Km. from river mouth. Railway bridge 0.4 Km. from mouth. 38° 10' 20" N.; 15° 39' 5" E.

* REGGIO

N.N.E. of Port. 3.6 Km., railway bridge (200 ft. long) and road bridge immediately behind. 0.4 Km. from river mouth. Trees near mouth. 38° 9' 20" N.; 15° 39' 30" E.

C. DELL'ARMI

N.W., 2.4 Km., railway bridge (400 ft. long) and road bridge immediately behind over River DI LAZZARO. Also a ford on the seaward side of the railway bridge. 200 m. from coast. 37° 58' 15" N.; 15° 40' 10" E.

C. DELL'ARMI to BOVALINO MARINA: Vulnerable Points:—

Bridges on the main road from REGGIO-BOVALINO MARINA. There is no alternative route between intermediate points.

C. DELL'ARMI

Three bridges—(1) S.E., 1.2 Km.; (2) S.E., 1.8 Km.; (3) S.E., 2.1 Km., over three mouths of River MOLARO. Railway bridges on shore between road bridges and coast. Road bridges about 100 m. from coast. Position of middle bridge, 37° 56' 45" N.; 15° 42' 25" E.

MELITO DI PORTO SALVO

(a) N.W., 3.6 Km., railway bridge and road bridge over River ELIA. 0.4 Km. from coast. 37° 55' 45" N.; 15° 44' 35" E.

(b) E., 1.1 Km., railway bridge and road bridge adjoining over River MELITO on shore. 37° 55' 0" N.; 15° 47' 40" E.

A* BOVA MARINA Station

(a) W., 3.2 Km., railway bridge (eight arches) and road bridge (immediately inland) over River AMENDOLEA. 200 m. from coast. 37° 55' 43" N.; 15° 53' 30" E.

(b) E. of station, railway bridge (190 ft. long) and road bridge immediately behind over River SIDERONI. 300 m. from coast. Landing place to left of river mouth in village. 37° 55' 50" N.; 15° 55' 40" E.

(c) E.S.E., 2.3 Km., railway bridge and road bridge (300 ft. long) immediately behind, over River PASQUALE. Only visible with difficulty from the sea. Landing place left of river mouth. 37° 55' 30" N.; 15° 57' 5" E.

C. SPARTIVENTO Station

(a) W., 6.4 Km. (near PALIZZI MARINA Station) railway bridge and road bridge over River AGLIATA. 0.3 Km. from coast. Landing place to left of river mouth. Landmark, a clock tower on west outskirts of PALIZZI MARINA. 37° 55' 15" N.; 15° 59' 10" E.

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- (b) W., 1 Km., railway bridge and road bridge (600 ft. long) over River SPROPOLI. 0.3 Km. from sandy shore. Landing place east of river mouth. $37^{\circ} 55' 25''$ N.; $16^{\circ} 3' 0''$ E.
- (c) N.E., 0.6 Km., railway bridge and road bridge over River RENOHIA. 200 m. from coast. $37^{\circ} 55' 40''$ N.; $16^{\circ} 4' 0''$ E.
- BOVALINO MARINA Station
- (a) S.W., 3 Km., railway bridge (160 ft. long) and road bridge over River BUONAMICO. 0.3 Km. from coast. Landing place at river mouth. $38^{\circ} 7' 35''$ N.; $16^{\circ} 9' 35''$ E.
- (b) S.W., 1.8 Km., railway bridge (250 ft. long) and road bridge over River CARERI. 0.3 Km. from coast. Landing at river mouth. $38^{\circ} 8' 10''$ N.; $16^{\circ} 10' 0''$ E.

BOVERINO MARINA to MONASTERACE: Vulnerable Points:—

Bridges on the main road from BOVALINO MARINA (road joins from BAGNARA on west coast)—GERACE (or LOCRI) MARINA (road joins from GIOIA on the west coast)—GIOIOSA (road joins from VISO VALENTIA)—MARINA DI MONASTERACE (road joins from mouth of River ANGITOLA on west coast) and onwards to TARANTO. There are no readily available alternative routes between the above-mentioned places except via the west coast or CITTANOVA and SERRE S. BRUNO.

B. GERACE MARINA (LOCRI MARINA) Station

- (a) S.W., 6.4 Km., railway bridge and road bridge (625 ft.) over River CONDOIANI. 200 m. from coast. Landing place at river mouth. $38^{\circ} 10' 20''$ N.; $16^{\circ} 13' 20''$ E.
- B.* (b) S.W., 5 Km., railway bridge and road bridge adjoining (500 ft. long) over PORTIGLIOLA. 200 m. from coast. Landing at river mouth. $38^{\circ} 11' 55''$ N.; $16^{\circ} 13' 55''$ E.
- (c) S.W., 1.5 Km., railway bridge and road bridge over River GERACE. 200 m. from coast. $38^{\circ} 13' 20''$ N.; $16^{\circ} 15' 20''$ E.
- B.* (d) N.E., 2.3 Km., railway bridge (500 ft. long) and road bridge over River SIDERNO (or NOVITO). 150 m. from sandy beach. Landing place at river mouth. $38^{\circ} 15' 0''$ N.; $16^{\circ} 16' 55''$ E.

GIOIOSA MARINA

S.W., 1 Km., railway bridge (650 ft. long) and road bridge (three arches) over River TORBIDO. At mouth of river. Landing to east of mouth on sandy beach near village. $38^{\circ} 17' 40''$ N.; $16^{\circ} 19' 28''$ E.

CAULONIA Station

- (a) N.E., 0.7 Km., three railway bridges and three road bridges, each 90–120 ft long, over three mouths of River ALLARO, 300–400 m. from each other. 0.4 Km. from shore. Landmark, CAMILLARI tower E.N.E., 300 m. $38^{\circ} 25' 30''$ N.; $16^{\circ} 34' 20''$ E.
- (b) N.E., 2 Km., railway bridge and road bridge over R. PRECARITI. 0.3 Km. from mouth. $38^{\circ} 21' 20''$ N.; $16^{\circ} 29' 0''$ E.

MONASTERACE MARINA Station

S.W., 1.1 Km., road bridge and railway bridge over four mouths of River MONTECUCCO. 200 m. from coast. $38^{\circ} 25' 30''$ N.; $16^{\circ} 34' 20''$ E.

MONASTERACE MARINA to MARINA DI CATANZARO: Vulnerable Points:—

Bridges on the main road from CATANZARO (NAPLES and TARANTO) to REGGIO via the east coast. The road from FRANCAVILLA to SOVERATO is the only really practicable road providing an alternative route from the west coast between the two terminal points of this section.

MONASTERACE MARINA Station

GIOIOSA (road joins from VISO VALENTIA) MARINA (road joins from GIOIA on the west coast) - from mouth of River ANGITOLA on west coast) and onwards to TARANTO. There are no readily available alternative routes between the above-mentioned places except via the west coast or CITTANOVA and SERRE S. BRUNO.

B. GERACE MARINA (LOCRI MARINA) Station

- (a) S.W., 6.4 Km., railway bridge and road bridge (625 ft.) over River CONDOIANI. 200 m. from coast. Landing place at river mouth. $38^{\circ} 10' 20''$ N.; $16^{\circ} 13' 20''$ E.
- (b) S.W., 5 Km., railway bridge and road bridge adjoining (500 ft. long) over PORTIGLIOLA. 200 m. from coast. Landing at river mouth. $38^{\circ} 11' 55''$ N.; $16^{\circ} 13' 55''$ E.
- (c) S.W., 1.5 Km., railway bridge and road bridge over River GERACE. 200 m. from coast. $38^{\circ} 13' 20''$ N.; $16^{\circ} 15' 20''$ E.
- (d) N.E., 2.3 Km., railway bridge (500 ft. long) and road bridge over River SIDERNO (or NOVITO). 150 m. from sandy beach. Landing place at river mouth. $38^{\circ} 15' 0''$ N.; $16^{\circ} 16' 55''$ E.

GIOIOSA MARINA

S.W., 1 Km., railway bridge (650 ft. long) and road bridge (three arches) over River TORBIDO. At mouth of river. Landing to east of mouth on sandy beach near village. $38^{\circ} 17' 40''$ N.; $16^{\circ} 19' 28''$ E.

CAULONIA Station

- (a) N.E., 0.7 Km., three railway bridges and three road bridges, each 90-120 ft long, over three mouths of River ALLARO, 300-400 m. from each other. 0.4 Km. from shore. Landmark, CAMILLARI tower E.N.E., 300 m. $38^{\circ} 25' 30''$ N.; $16^{\circ} 34' 20''$ E.
- (b) N.E., 2 Km., railway bridge and road bridge over R. PRECARITI. 0.3 Km. from mouth. $38^{\circ} 21' 20''$ N.; $16^{\circ} 29' 0''$ E.

MONASTERACE MARINA Station

S.S.W., 1.1 Km., road bridge and railway bridge over four mouths of River MONTECUCO. 200 m. from coast. $38^{\circ} 25' 30''$ N.; $16^{\circ} 34' 20''$ E.

MONASTERACE MARINA to MARINA DI CATANZARO: Vulnerable Points:—

Bridges on the main road from CATANZARO (NAPLES and TARANTO) to REGGIO via the east coast. The road from FRANCAVILLA to SOVERATO is the only really practicable road providing an alternative route from the west coast between the two terminal points of this section.

MONASTERACE MARINA Station

- (a) N., 3.9 Km., railway bridge and road bridge over River VINCERELLO. 250 m. from mouth. $38^{\circ} 28' 10''$ N.; $16^{\circ} 34' 55''$ E.
- (b) N., 7.6 Km., railway bridge and road bridge over LUNARI torrent. 0.3 Km. from coast. $38^{\circ} 30' 10''$ N.; $16^{\circ} 34' 40''$ E.

BADOLATO Station

S., 0.4 Km., railway bridge and road bridge over VODA torrent. 0.4 Km. from river mouth. $38^{\circ} 34' 10''$ N.; $16^{\circ} 34' 10''$ E.

SOVERATO Station

N.N.W., 2.8 Km., railway bridge and road bridge over River SOVERATO and crossing narrow island in river mouth. 0.4 Km. from coast. $38^{\circ} 42' 20''$ N.; $16^{\circ} 32' 5''$ E.

A. MARINA DI CATANZARO Station

S.W., 0.6 Km., railway bridge and road bridge (475 ft. long) over CORACE River. 0.4 Km. from coast. Landmark, MARINA DI CATANZARO, ruins of a long red church, 1 Km. to south. $38^{\circ} 49' 0''$ N.; $16^{\circ} 36' 30''$ E.

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Vulnerable Points on Railways and Roads

(II) SICILY

(See Plans 1 and 87)

There are considerable stretches of both standard gauge and narrow gauge (principally metre) track. With the exception of the north and north-east of the island, where standard gauge predominates, there is no regional monopoly of any one gauge. As a result there are a considerable number of interchange stations where interruption to traffic may cause great inconvenience to working on both gauges. Furthermore, interruption to traffic on certain stretches of track may prevent through running on the same gauge and cause considerable traffic congestion owing to the enforced break of traffic at interchange stations.

The principal interchange stations are :—

(i) EAST COAST

- (a) RIPOSTO and CATANIA for the Circum-ETNA narrow-gauge railway.
- (b) SYRACUSE for the SYRACUSE-GIARRATANA-VIZZINI-RAGUSA narrow-gauge railway.

Interruption to the above exchange stations would be of comparatively little importance because the narrow-gauge railways concerned are principally of local significance. The Circum-ETNA railway would only attain more than local importance following interruption to the main CATANIA-MESSINA standard-gauge railway between CATANIA and RIPOSTO. Under such conditions the Circum-ETNA railway could provide, at the expense of a break of gauge, an alternative and circuitous route from CATANIA to RIPOSTO and MESSINA. Interruption to the CATANIA-MESSINA railway between RIPOSTO and MESSINA would, however, effectively discount any such value of the Circum-ETNA railway.

VIZZINI and RAGUSA are both served by alternative standard-gauge routes from SYRACUSE, so that the SYRACUSE-GIARRATANA-VIZZINI and RAGUSA narrow-gauge line is only likely to become of more than local importance as a result of widespread interruption to the standard-gauge railway system.

(ii) NORTH COAST

PALERMO is the only interchange point on the north coast. Interruption of the narrow-gauge railway near PALERMO would interfere with all traffic towards the south coast between CASTELVETRANO and PORTO EMPEDOCLE and LICATA. There are, however, alternative standard-gauge routes from PALERMO to all three of the above-mentioned towns.

(iii) SOUTH COAST

CASTELVETRANO, PORTO EMPEDOCLE and AGRIGENTO and LICATA. There are easily available alternative routes between PORTO EMPEDOCLE, AGRIGENTO and LICATA by both standard and narrow gauge. Between CASTELVETRANO (which is a considerable distance from the coast, 12 Km.) and the three other interchange stations, on, or nearer, the south coast, the only standard-gauge alternative route is via PALERMO, and is thus considerably longer than the narrow-gauge route.

The railways generally follow all the coasts closely except the south coast which is only approached in discontinuous sections. In view, however, of the existence of alternative routes and of variations in gauge, interruptions to certain sections of track will achieve far greater inconvenience than other sections.

Accordingly the vital vulnerable sections are :—

(i) EAST COAST

SYRACUSE to CATANIA. Interruption to this line would cause the almost complete breakdown of railway traffic between these two places, but little else. Interruption to the section between BICOCCA and CATANIA would in addition vitally affect the traffic between CATANIA and PALERMO and the WEST.

(b) SYRACUSE for the SYRACUSE-AGRIGENTO narrow-gauge railway.

Interruption to the above exchange stations would be of comparatively little importance because the narrow-gauge railways concerned are principally of local significance. The Circum-ETNA railway would only attain more than local importance following interruption to the main CATANIA-MESSINA standard-gauge railway between CATANIA and RIPOSTO. Under such conditions the Circum-ETNA railway could provide, at the expense of a break of gauge, an alternative and circuitous route from CATANIA to RIPOSTO and MESSINA. Interruption to the CATANIA-MESSINA railway between RIPOSTO and MESSINA would, however, effectively discount any such value of the Circum-ETNA railway.

VIZZINI and RAGUSA are both served by alternative standard-gauge routes from SYRACUSE, so that the SYRACUSE-GIARRATANA-VIZZINI and RAGUSA narrow-gauge line is only likely to become of more than local importance as a result of widespread interruption to the standard-gauge railway system.

(ii) NORTH COAST

PALERMO is the only interchange point on the north coast. Interruption of the narrow-gauge railway near PALERMO would interfere with all traffic towards the south coast between CASTELVETRANO and PORTO EMPEDOCLE and LICATA. There are, however, alternative standard-gauge routes from PALERMO to all three of the above-mentioned towns.

(iii) SOUTH COAST

CASTELVETRANO, PORTO EMPEDOCLE and AGRIGENTO and LICATA. There are easily available alternative routes between PORTO EMPEDOCLE, AGRIGENTO and LICATA by both standard and narrow gauge. Between CASTELVETRANO (which is a considerable distance from the coast, 12 Km.) and the three other interchange stations, on, or nearer, the south coast, the only standard-gauge alternative route is via PALERMO, and is thus considerably longer than the narrow-gauge route.

The railways generally follow all the coasts closely except the south coast which is only approached in discontinuous sections. In view, however, of the existence of alternative routes and of variations in gauge, interruptions to certain sections of track will achieve far greater inconvenience than other sections.

Accordingly the vital vulnerable sections are :-

(i) EAST COAST

SYRACUSE to CATANIA. Interruption to this line would cause the almost complete breakdown of railway traffic between these two places, but little else. Interruption to the section between BICOCCA and CATANIA would in addition vitally affect the traffic between CATANIA and PALERMO and the WEST.

CATANIA and MESSINA. Interruption to the section MESSINA-RIPOSTO could be overcome by the use of the circuitous Circum-ETNA railway, but this would also entail a break of gauge. Interruption to the line between RIPOSTO and MESSINA would thus interfere more vitally with traffic from CATANIA to MESSINA. The alternative standard-gauge route between CATANIA and MESSINA by FIUMETORTO is so circuitous that it can hardly be regarded as a practicable alternative.

(ii) NORTH COAST

MESSINA to FIUMETORTO (standard gauge). Interruption to traffic would occur on the direct line from MESSINA to PALERMO, but the alternative standard-gauge route via CATANIA would still remain.

FIUMETORTO to PALERMO. All traffic between the east (including MESSINA, CATANIA and SYRACUSE) and PALERMO by standard gauge would be interrupted. Also all standard-gauge traffic from the west coast (e.g. TRAPANI) and PALERMO to the east would be interrupted.

PALERMO to CASTELLAMARE. All standard-gauge traffic from the west coast would be interrupted. There is no satisfactory narrow-gauge alternative route.

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(iii) WEST COAST

TRAPANI, MARSALA and MAZZARA (standard gauge). Interruption to this section would only be local owing to the existence of the loop SEGESTA, TRAPANI, MARSALA, MAZZARA, CASTELVETRANO, SEGESTA (junction for PALERMO).

(iv) SOUTH COAST

CASTELVETRANO to PORTO EMPEDOCLE. Interruption to this narrow-gauge line would cause considerable inconvenience to traffic moving along the south coast, but there is an inner alternative narrow-gauge route for much of the way, and an alternative, but very circuitous route (via PALERMO), for all of the way.

PORTO EMPEDOCLE to LICATA. Easily available alternative standard- and narrow-gauge routes exist between these two places.

LICATA to SYRACUSE via POZZOLO (standard gauge). An alternative standard-gauge route exists via ENNA and CATANIA. This alternative route is primarily important in linking PORT EMPEDOCLE and LICATA, both on the south coast, directly with CATANIA, but could, in case of necessity, be used as an alternative route from the south coast to SYRACUSE.

Note.—From the above it can be seen that greater disruption to traffic can be achieved by interference with the section between FIUMETORTO-PALERMO than with any other line.

In the description of the objectives which follow, "bridge," without any further qualification, refers to a railway bridge. The first-mentioned bridge is always the one nearest the coast, and the exact position is always that of the railway bridge.

EAST COAST (Standard-Gauge Railway) : Vulnerable Points :—

(i) SYRACUSE to CATANIA

C.S. PANAGIA

(a) S., 2.5 Km., railway bridge over gully, at mouth of which lie two small islands SCOGGIO DUE PEATELLI. 100 m. from coast. $37^{\circ} 5' 4''$ N. : $15^{\circ} 18' 0''$ E.

(b) W.N.W., 6 Km., small bridge over intermittent stream. 250 m. from coast. $37^{\circ} 7' 9''$ N. : $15^{\circ} 13' 44''$ E.

PRIOLO STATION

(a) N., 0.2 Km., bridge over MOSTRINGIANO or PRIOLO Torrent, 300 m. from coast. Landmark—Torre del FICO. Vineyards. $37^{\circ} 9' 29''$ N. : $15^{\circ} 11' 50''$ E.

(b) N., 0.7 Km., railway bridge over CANNIOLO Torrent. 450 m. from coast. $37^{\circ} 9' 46''$ N. : $15^{\circ} 11' 43''$ E.

FARO CANTERA

(a) N.W., 0.55 Km., bridge over CANTERA Torrent, embankments either side of bridge. 250 m. from coast. $37^{\circ} 12' 22''$ N. : $15^{\circ} 10' 46''$ E.

(b) N.N.W., 1.3 Km., bridge over River MARCELLINO, embankments on either side. 400 m. from mouth. $37^{\circ} 12' 53''$ N. : $15^{\circ} 10' 49''$ E.

(c) N., 3.4 Km., railway bridge over River MULINELLO, embankment on either side. 800 m. from mouth. Salt pans either side of river mouth. $37^{\circ} 14' 2''$ N. : $15^{\circ} 10' 51''$ E.

P. CASTELUZZO

(c) S.E., 3.8 Km., railway bridge (100 ft. above sea level) over torrent. 400 Km.

could, in case of necessity, be used as an alternative route from the south coast to SYRACUSE.

Note.—From the above it can be seen that greater disruption to traffic can be achieved by interference with the section between FIUMETORTO-PALERMO than with any other line.

In the description of the objectives which follow, "bridge," without any further qualification, refers to a railway bridge. The first-mentioned bridge is always the one nearest the coast, and the exact position is always that of the railway bridge.

EAST COAST (Standard-Gauge Railway): Vulnerable Points:—

(i) SYRACUSE to CATANIA

C.S. PANAGIA

(a) S., 2.5 Km., railway bridge over gully, at mouth of which lie two small islands SCGLIO DUE PEATELLI. 100 m. from coast. $37^{\circ} 5' 4''$ N.; $15^{\circ} 18' 0''$ E.

(b) W.N.W., 6 Km., small bridge over intermittent stream. 250 m. from coast. $37^{\circ} 7' 9''$ N.; $15^{\circ} 13' 44''$ E.

PRIOLO STATION

(a) N., 0.2 Km., bridge over MOSTRINGIANO or PRIOLO Torrent. 300 m. from coast. Landmark—Torre del FICO. Vineyards. $37^{\circ} 9' 29''$ N.; $15^{\circ} 11' 50''$ E.

(b) N., 0.7 Km., railway bridge over CANNIOLO Torrent. 450 m. from coast. $37^{\circ} 9' 46''$ N.; $15^{\circ} 11' 43''$ E.

FARO CANTERA

(a) N.W., 0.55 Km., bridge over CANTERA Torrent, embankments either side of bridge. 250 m. from coast. $37^{\circ} 12' 22''$ N.; $15^{\circ} 10' 46''$ E.

(b) N.N.W., 1.3 Km., bridge over River MARCELLINO, embankments on either side. 400 m. from mouth. $37^{\circ} 12' 53''$ N.; $15^{\circ} 10' 49''$ E.

(c) N., 3.4 Km., railway bridge over River MULINELLO, embankment on either side. 800 m. from mouth. Salt pans either side of river mouth. $37^{\circ} 14' 2''$ N.; $15^{\circ} 10' 51''$ E.

P. CASTELUZZO

(a) S.E., 3.8 Km., railway bridge (100 ft. above sea level) over Torrent. 400 Km. from coast. Vineyards. $37^{\circ} 17' 0''$ N.; $15^{\circ} 9' 40''$ E.

There is another similar bridge 300 m. N.E.

(b) S.E., 2.5 Km., railway bridge over small torrent. 250 m. from coast. $37^{\circ} 17' 32''$ N.; $15^{\circ} 9' 0''$ E.

(c) S.E., 1.95 Km., railway bridge over torrent. 300 m. from coast. $37^{\circ} 17' 43''$ N.; $15^{\circ} 8' 44''$ E.

All these four bridges lie in steep-sided valleys which issue into small coves, and have short embankments on either side of them.

(d) S.S.W., 0.6 Km., long (at least four spans) railway bridge (height 98 ft.) over S. CALOGERO. 500 m. from river mouth. Landmark, AGNONE Tower (2.1 Km. W.). $37^{\circ} 18' 14''$ N.; $15^{\circ} 7' 44''$ E.

(e) W., 1.25 Km., bridge over torrent. 250 m. from coast. $37^{\circ} 18' 21''$ N.; $15^{\circ} 7' 3''$ E.

SECTION IV (3)

(ii) CATANIA to C. SCHISO

CATANIA. Catania viaduct (760 yards long, 16-22 ft. high) extends along the north side of the Porto VECCHIO, and as far as the East mole.

GIARRE (RIPOSTO) Station

- (a) S., 6.1 Km., railway bridge over river. 1.8 Km. from coast. Vineyards. $37^{\circ} 40' 30''$ N. : $15^{\circ} 10' 45''$ E.
- (b) S., 3.2 Km., railway bridge over stream. 1.2 Km. from cliff. $37^{\circ} 42' 0''$ N. : $15^{\circ} 11' 53''$ E.
- (c) N.W., 1.1 Km., railway bridge over MACCHIA Torrent. 1.7 Km., from coast. $37^{\circ} 44' 15''$ N. : $15^{\circ} 11' 8''$ E.
- (d) N., 2.0 Km., railway bridge over T. VALLONAZZO. 1.6 Km. from beach. $37^{\circ} 44' 45''$ N. : $15^{\circ} 11' 18''$ E.

FIUME FREDDO DI SICILIA Station

- S., 0.8 Km., bridge over stream. 2.7 Km. from coast. $37^{\circ} 47' 15''$ N. : $15^{\circ} 12' 13''$ E.

(iii) CAPE SCHISO-MESSINA

CAPE SCHISO

- (a) W., 3.0 Km., railway bridge over River ALCANTARA. 2.1 Km. from coast; road bridge 1.7 Km. from coast. Woods behind shore. Landing. wood by river mouth on alluvial plain. $37^{\circ} 49' 10''$ N. : $15^{\circ} 14' 35''$ E.
- (b) W., 1.1 Km., bridge over S. VENERA. 0.85 Km. from river mouth Landing place, mouth of river on alluvial plain. $37^{\circ} 49' 20''$ N. : $15^{\circ} 15' 55''$ E.

CAPO di TAORMINA

- (a) W.S.W., 2.6 kms. road bridge and railway bridge (immediately behind road bridge) over the Torrent GIOVANNI. 200 m. from shore. $37^{\circ} 50' 30''$ N. : $15^{\circ} 6' 20''$ E.
- (b) W., 1.6 Kms., railway bridge and road bridge (immediately behind) over the Torrent SIRINA. 100 m. from shore. $37^{\circ} 50' 30''$ N. : $15^{\circ} 6' 50''$ E.

CAPE S. ANDREA

- N., 3.2 Km., combined railway and road bridge (130 ft. long, three arches) over LETOJANNI Torrent. 100 m. from sandy beach. Landing at river mouth. $37^{\circ} 52' 40''$ N. : $15^{\circ} 18' 20''$ E.

CAPE S. ALESSIO

- (a) S.W., 3.4 Km., railway bridge (100 ft. long) and road bridge over S. FILIPPO Torrent. Railway bridge, 150 m. from coast; road bridge, 350 m. from coast. Landing at river mouth. Sandy beach. $37^{\circ} 63' 23''$ N. : $15^{\circ} 19' 18''$ E.
- (b) S.W., 1.3 Km., railway (100 ft. long) and road bridges over FONDACA PARRINO Torrent. Railway bridge 110 m. from coast; road bridge immediately inland. Landing north of mouth. Sandy beach. $37^{\circ} 54' 18''$ N. : $15^{\circ} 20' 11''$ E.

S. ALESSIO Station

- (a) S.W. 0.4 Km. road bridge

S., 0.8 Km., bridge over stream. 2.7 Km. from coast. 37° 47' 15" N.
15° 12' 13" E.

(iii) CAPE SCHISO-MESSINA

CAPE SCHISO

- (a) W., 3.0 Km., railway bridge over River ALCANTARA. 2.1 Km. from coast; road bridge 1.7 Km. from coast. Woods behind shore. Landing wood by river mouth on alluvial plain. 37° 49' 10" N.; 15° 14' 35" E.
- (b) W., 1.1 Km., bridge over S. VENERA. 0.85 Km. from river mouth. Landing place, mouth of river on alluvial plain. 37° 49' 20" N.; 15° 15' 55" E.

CAPO di TAORMINA

- (a) W.S.W., 2.6 kms. road bridge and railway bridge (immediately behind road bridge) over the Torrent GIOVANNI. 200 m. from shore. 37° 50' 30" N.; 15° 6' 20" E.
- (b) W., 1.6 Kms., railway bridge and road bridge (immediately behind) over the Torrent SIRINA. 100 m. from shore. 37° 50' 30" N.; 15° 6' 50" E.

CAPE S. ANDREA

N., 3.2 Km., combined railway and road bridge (130 ft. long, three arches) over LETOJANNI Torrent. 100 m. from sandy beach. Landing at river mouth. 37° 52' 40" N.; 15° 18' 20" E.

CAPE S. ALESSIO

- (a) S.W., 3.4 Km., railway bridge (100 ft. long) and road bridge over S. FILIPPO Torrent. Railway bridge, 150 m. from coast; road bridge, 350 m. from coast. Landing at river mouth. Sandy beach. 37° 53' 23" N.; 15° 19' 18" E.
- (b) S.W., 1.3 Km., railway (100 ft. long) and road bridges over FONDACA PARRINO Torrent. Railway bridge 110 m. from coast; road bridge immediately inland. Landing north of mouth. Sandy beach. 37° 54' 18" N.; 15° 20' 11" E.

S. ALESSIO Station

- (a) S.W., 0.4 Km., road bridge and railway bridge over S. ALESSIO Torrent. 225 m. from coast. Landing place on sandy beach. 37° 55' 13" N.; 15° 20' 48" E.
- (b) N.E., 1.1 Km., combined steel road and railway bridge (330 ft. long, 13 spans) over AGRO Torrent. 400 m. from coast. Landing place, river mouth. Sandy beach. 37° 55' 57" N.; 15° 21' 14" E.

S. TERESA DI RIVA Station

- (a) S.W., 0.9 Km., road bridge and railway bridge (135 ft. long), over PORTO SALVO Torrent. 250 m. from shore. 37° 56' 36" N.; 15° 21' 45" E.
- (b) N.E., 1.45 Km., combined road and railway bridge (330 ft., five arches) over R. SAVOCA. 500 m. from coast. Landing place mouth of river. Shingle beach. 37° 57' 29" N.; 15° 22' 33" E.
- (c) N.E., 2.5 Km., combined road and railway bridge (330 ft. long) (five arches) over R. DI PAGLIARA. 350 m. from beach. 37° 57' 53" N.; 15° 23' 5" E.

SECTION IV (3) 37

NIZZA Station

(a) S.W., 0.75 Km., combined road and railway bridge (100 ft. long) over BOTTEGHELLE Stream, 160 m. from coast. Landing place at river mouth. Shingle beach. Landmark, big battlemented tower. $37^{\circ} 58' 48''$ N.; $15^{\circ} 23' 58''$ E.

(b) N.E., 1.5 Km., combined road and railway bridge (460 ft. long, four arches) over River FIUMEDINISI. 360 m. from coast. Landing at river mouth. Landmark, church on south bank. $37^{\circ} 59' 48''$ N.; $15^{\circ} 24' 52''$ E.

ALI MARINA Station

N.E., 0.25 Km., road bridge and railway bridge (190 ft. long) over River ALI. 180 m. from coast. Landmark, Castle BELVEDERE. $38^{\circ} 0' 22''$ N.; $15^{\circ} 25' 32''$ E.

CAPE D'ALI

N.N.E., 0.8 Km., small road bridge and small railway bridge over River VALLE CALAMACI. 100 m. from shore. $38^{\circ} 1' 30''$ N.; $15^{\circ} 26' 32''$ E.

CAPE SCALETTA

(a) S.W., 2.5 Km., combined road and railway bridge over River D'ITALA. 50 m. from coast. Landmark, white railway embankment. $38^{\circ} 2' 18''$ N.; $15^{\circ} 27' 26''$ E.

(b) S.W., 1.65 Km., railway bridge and road bridge over the SAPONARA Torrent. 50 m. from coast. $38^{\circ} 2' 36''$ N.; $15^{\circ} 27' 49''$ E.

(c) S.W., 0.8 Km., railway bridge and road bridge over the DIVIETO Torrent. 50 m. from coast. $38^{\circ} 2' 54''$ N.; $15^{\circ} 28' 16''$ E.

(d) N.N.E., 0.7 Km., combined road and railway bridge (100 ft. long) over River GIAMPILIERI. 240 m. from sandy beach. Landing at river mouth. Landmark, white chapel with pointed spire. $38^{\circ} 3' 32''$ N.; $15^{\circ} 28' 45''$ E.

(e) N.W., 2.0 Km., combined railway and road bridge (66 ft. long) over River PEZZOLO. 200 m. from sandy beach. Landing at river mouth. Landmark, to south, white chapel with square belfry. $38^{\circ} 4' 8''$ N.; $15^{\circ} 29' 18''$ E.

PONTE-SCHIAVO

N., road bridge and railway bridge over PONTE-SCHIAVO River. 200 m. from coast. Landmark, School of Agriculture. $38^{\circ} 4' 45''$ N.; $15^{\circ} 29' 41''$ E.

PONTE S. STEFANO Station

(a) Immediately N., combined road and railway bridge (200 ft. long, three arches) over River S. STEFANO. 240 m. from sandy shore. Landing place at mouth. $38^{\circ} 5' 43''$ N.; $15^{\circ} 30' 13''$ E.

(b) N.N.E., 1.4 Km., road bridge and railway bridge over River GALATI. 250 m. from coast. $38^{\circ} 6' 24''$ N.; $15^{\circ} 30' 27''$ E.

(c) N.N.E., 2.5 Km., road bridge and railway bridge (49 ft. long) over MILI Torrent. 350 m. from sandy beach. Landing at river mouth. $38^{\circ} 6' 57''$ N.; $15^{\circ} 30' 49''$ E.

MILI MARINA Station

(a) N.N.E., 0.45 Km., railway bridge and road bridge over VALLE CUBIADI

N.N.E., 0.8 Km., small road bridge and small railway bridge over River VALLE CALAMACI. 100 m. from shore. 38° 1' 30" N.; 15° 26' 32" E.

CAPE SCALETTA

- (a) S.W., 2.5 Km., combined road and railway bridge over River D'ITALA. 50 m. from coast. Landmark, white railway embankment. 38° 2' 18" N.; 15° 27' 26" E.
- (b) S.W., 1.65 Km., railway bridge and road bridge over the SAPONARA Torrent. 50 m. from coast. 38° 2' 36" N.; 15° 27' 49" E.
- (c) S.W., 0.8 Km., railway bridge and road bridge over the DIVIETO Torrent. 50 m. from coast. 38° 2' 54" N.; 15° 28' 16" E.
- (d) N.N.E., 0.7 Km., combined road and railway bridge (100 ft. long) over River GIAMPILIERI. 240 m. from sandy beach. Landing at river mouth. Landmark, white chapel with pointed spire. 38° 3' 32" N.; 15° 28' 45" E.
- (e) N.W., 2.0 Km., combined railway and road bridge (66 ft. long) over River PEZZOLO. 200 m. from sandy beach. Landing at river mouth. Landmark, to south, white chapel with square belfry. 38° 4' 8" N.; 15° 29' 18" E.

PONTE-SCHIAVO

N., road bridge and railway bridge over PONTE-SCHIAVO River. 200 m. from coast. Landmark, School of Agriculture. 38° 4' 45" N.; 15° 29' 41" E.

PONTE S. STEFANO Station

- (a) Immediately N., combined road and railway bridge (200 ft. long, three arches) over River S. STEFANO. 240 m. from sandy shore. Landing place at mouth. 38° 5' 43" N.; 15° 30' 13" E.
- (b) N.N.E., 1.4 Km., road bridge and railway bridge over River GALATI. 250 m. from coast. 38° 6' 24" N.; 15° 30' 27" E.
- (c) N.N.E., 2.5 Km., road bridge and railway bridge (49 ft. long) over MILI Torrent. 350 m. from sandy beach. Landing at river mouth. 38° 6' 57" N.; 18° 30' 49" E.

MILI MARINA Station

- (a) N.N.E., 0.45 Km., railway bridge and road bridge over VALLONE GUIDARI. 150 m. from coast. 38° 7' 35" N.; 15° 31' 15" E.
- (b) N.N.E., 1.2 Km., combined road and railway bridge (50 ft. long) over River LARDERIA. 120 m. from river mouth. Landing at river mouth. 38° 7' 57" N.; 15° 31' 28" E.
- (c) N.N.E., 2.3 Km., railway bridge (130 ft. long) over ZAFFARIA Torrent. 100 m. from sandy beach. Landing at river mouth. 38° 8' 29" N.; 15° 31' 50" E.
- (d) N.N.E., 2.9 Km., railway bridge (160 ft. long) over S. FILIPPO Torrent. 150 m. from sandy beach. 38° 8' 48" N.; 15° 32' 2" E.
- (e) N.N.E., 3.35 Km., railway bridge over River CONTRESSE. 100 m. from sandy beach. Landing at river mouth. 38° 8' 59" N.; 15° 32' 12" E.

MESSINA Station

S.S.W., 3.1 Km., railway bridge over GAZZI Torrent. 100 m. from coast. 38° 9' 35" N.; 15° 32' 39" E.

38 SECTION IV (3)

NORTH COAST (Standard-Gauge Railway): Vulnerable Points:—

(i) MESSINA to CAPE MILAZZO

CAPE MILAZZO

- (a) E.S.E., 17.7 Km., road bridge and long railway bridge over stream. 1.1 Km. from beach. $38^{\circ} 14' 0''$ N.; $15^{\circ} 25' 53''$ E.
- (b) E.S.E., 17.0 Km., road and railway bridges over stream. 1.0 Km. from beach. $38^{\circ} 13' 50''$ N.; $15^{\circ} 25' 23''$ E.
- (c) E.S.E., 15.0 Km., road and railway bridge over stream. 0.7 Km. from shore. $38^{\circ} 13' 25''$ N.; $15^{\circ} 23' 48''$ E.
- (d) S.E., 11.1 Km., combined (?) road and railway bridge over River DI NICETO. 1.1 Km. from shore. $38^{\circ} 12' 20''$ N.; $15^{\circ} 19' 55''$ E.
- (e) S.E., 10.7 Km., railway and road bridges over MUTO Torrent. 0.9 Km. from shore. $38^{\circ} 12' 15''$ N.; $15^{\circ} 19' 28''$ E.
- (f) S.S.E., 8.3 Km., railway bridge over CORRIOLO Torrent. 0.5 Km. from mouth. $38^{\circ} 12' 5''$ N.; $15^{\circ} 16' 25''$ E.

(ii) CAPE MILAZZO to CAPE ORLANDO

CAPE MILAZZO LIGHTHOUSE

S., 10.4 Km., bridge (820 ft. long) over MELA Torrent. 1.6 Km. from coast. Vineyards. $38^{\circ} 10' 30''$ N.; $15^{\circ} 13' 28''$ E.

CAPE TINDARI

- (a) E., 11.3 Km., railway bridge over RODI Torrent. 1.3 Km. from beach. Landmark, CONFONE Tower. Landing right of river mouth near CONFONE Tower. $38^{\circ} 8' 25''$ N.; $15^{\circ} 10' 33''$ E.
- (b) E.S.E., 8.4 Km., railway bridge over MAZARRA Torrent. 1.3 Km. from beach. $38^{\circ} 7' 30''$ N.; $15^{\circ} 8' 13''$ E. (0.5 Km. further upstream road bridge, 147 ft. long, 17 arches.)
- (c) S.E., 5 Km., bridge over FALLAZZA Torrent, on beach. $38^{\circ} 7' 10''$ N.; $15^{\circ} 54' 18''$ E.

CAPE CALAVA

- (a) S.W., 3.1 Km. (immediately west of GIOJOSA MAREA Station), railway bridge and road bridge (immediately behind) over stream. Close to coast. $38^{\circ} 10' 20''$ N.; $14^{\circ} 53' 33''$ E.
- (b) W.S.W., 7.9 Km., two railway bridges over S. ANGELO and another stream. 0.2 Km. from beach. $38^{\circ} 9' 30''$ N.; $14^{\circ} 50' 18''$ E.

CAPE ORLANDO

- (a) E., 6.6 Km., railway bridge and road bridge over BROLO Stream. 0.1 Km. from coast. $38^{\circ} 9' 30''$ N.; $14^{\circ} 49' 28''$ E.
- (b) E.S.E., 4.8 Km., railway bridge and road bridge over River DI NASO. 0.2 Km. from coast. $38^{\circ} 9' 5''$ N.; $14^{\circ} 48' 8''$ E.
- (c) E.S.E., 4 Km., railway bridge and road bridge over inlet on coast. $38^{\circ} 8' 55''$ N.; $14^{\circ} 47' 28''$ E.

(iii) CAPE ORLANDO to CEFALU

CAPE ORLANDO

(ii) CAPE MILAZZO to CAPE ORLANDO

CAPE MILAZZO LIGHTHOUSE

S., 10.4 Km., bridge (820 ft. long) over MELA Torrent. 1.6 Km. from coast. Vineyards. 38° 10' 30" N.; 15° 13' 28" E.

CAPE TINDARI

- (a) E., 11.3 Km., railway bridge over RODI Torrent. 1.3 Km. from beach. Landmark, CONFONE Tower. Landing right of river mouth near CONFONE Tower. 38° 8' 25" N.; 15° 10' 33" E.
- (b) E.S.E., 8.4 Km., railway bridge over MAZARRA Torrent. 1.3 Km. from beach. 38° 7' 30" N.; 15° 8' 13" E. (0.5 Km. further upstream road bridge, 147 ft. long, 17 arches.)
- (c) S.E., 5 Km., bridge over FALLAZZA Torrent, on beach. 38° 7' 10" N.; 15° 54' 18" E.

CAPE CALAVA

- (a) S.W., 3.1 Km. (immediately west of GIOJOSA MAREA Station), railway bridge and road bridge (immediately behind) over stream. Close to coast. 38° 10' 20" N.; 14° 53' 33" E.
- (b) W.S.W., 7.9 Km., two railway bridges over S. ANGELO and another stream. 0.2 Km. from beach. 38° 9' 30" N.; 14° 50' 18" E.

CAPE ORLANDO

- (a) E., 6.6 Km., railway bridge and road bridge over BROLO Stream. 0.1 Km. from coast. 38° 9' 30" N.; 14° 49' 28" E.
- (b) E.S.E., 4.8 Km., railway bridge and road bridge over River DI NASO. 0.2 Km. from coast. 38° 9' 5" N.; 14° 48' 8" E.
- (c) E.S.E., 4 Km., railway bridge and road bridge over inlet on coast. 38° 8' 55" N.; 14° 47' 28" E.

(iii) CAPE ORLANDO to CEFALU

CAPE ORLANDO

S.W., 5.9 Km., long railway bridge over River DI ZAPPULLA. 0.4 Km. from beach. 38° 7' 25" N.; 14° 42' 30" E.

S. AGATA DI MILITELLO Station

- (a) N.E., 4.4 Km., railway bridge over PATANA Torrent. Close to shore. 38° 5' 50" N.; 14° 40' 48" E.
- (b) N.E., 2.3 Km., long bridge over ROSMARINO Stream. 0.4 Km. from beach. 38° 5' 5" N.; 14° 39' 42" E.
- (c) W.S.W., 2.6 Km., two rail bridges over mouths of River INGANNO. 0.3 Km. from beach. 38° 3' 55" N.; 14° 36' 45" E.
- (d) W.S.W., 7.4 Km., long bridge over FURIANO Torrent. 0.2 Km. from beach. 38° 3' 30" N.; 14° 33' 33" E.
- (e) W.S.W., 14.4 Km., rail and road bridges over BUZZA Torrent. 0.1 Km. from shore. 38° 2' 5" N.; 14° 29' 8" E.

SECTION IV (3) 39

CATONIA MARINA Station

W., 1.4 Km., railway bridge over River DI CATONIA. 0.5 Km. from beach. 38° 2' 0" N.; 14° 25' 33" E.

S. STEFANO DI CAMASTRA Station

W., 1.1 Km., railway bridge over River STEFANO. 0.2 Km. from mouth. 38° 0' 50" N.; 14° 20' 28" E.

POLLINA Station

(a) E., 8.6 Km., combined (?) railway and road bridge over River TUSA. 0.2 Km. from mouth. 38° 0' 35" N.; 14° 16' 23" E.

(b) E., 0.1 Km., rail and road bridges. 0.3 Km. from coast. POLLINA station is isolated between two tunnels, on the left bank of the DI POLLINA River. Landing place at mouth. Landmark, half ruined tower between mouth and CAPE FINALE (RAISIGELBI). Telegraph on Cape FINALE. 38° 1' 0" N.; 14° 10' 38" E.

CASTEL BUONO Station

W., 0.4 Km., railway and road bridges over MALPERTUGIO Torrent. Close to shore. 38° 0' 50" N.; 14° 6' 13" E.

(iv) CEFALU to CAPE ZAFFERANO

CAMPO FELICE DI ROCCELLA Station

(a) E.N.E., 4.6 Km., railway bridge and road bridge over River PILETTO. 0.8 Km. from coast. 38° 0' 30" N.; 13° 55' 28" E.

(b) E.N.E., 1.3 Km., railway and road bridges over ROCCELLA Torrent. 0.5 Km. from beach. 37° 59' 45" N.; 13° 53' 23" E.

GRANDE RIVER

Masonry railway bridge (nine arches, over 500 ft. long) and road bridge (immediately behind). 1.15 Km. from river mouth. Landing, sandy beach in front of the mouth. 37° 58' 25" N.; 13° 49' 30" E.

Between the ROCCELLA Torrent and River GRANDE there are seven small bridges or culverts.

TERMINI IMERESE Station

(a) E., 5.8 Km., railway bridge (160 ft. long) at FIUMETORTO junction, over River TORTO. 0.7 Km. from sandy beach. Railway junction for line running down right bank of River TORTO, 800 m. to east of bridge. Landmark, two groups of storied houses. Landing, left bank of river mouth, safe anchorage anywhere in front. 37° 57' 50" N.; 13° 45' 58" E.

(b) N.W., long railway bridge and road bridge over stream. 30 m. from coast. Landing, sandy beach in front of viaduct. 37° 58' 50" N.; 13° 42' 13" E.

(c) N.W., 1.9 Km., railway bridge (200 ft. long) over River S. LEONARDO. 140 m. from beach. Landing near mouth of river. 37° 59' 30" N.; 13° 41' 13" E.

CAPE ZAFFERANO

(a) S.E., 14.8 Km., road bridge close to coast and railway bridge. 0.6 Km. from coast over BURGIO Torrent. 38° 0' 10" N.; 13° 37' 58" E.

(b) S.S.E., 8.4 Km., railway bridge (65 ft. long) and road bridges (65 ft. long) over S. MICHELE Torrent. 100 m. from sandy beach. Landing at mouth of torrent. 38° 2' 20" N.; 13° 33' 50" E.

(c) S., 6.9 Km., railway bridge (200 ft. long) and road bridge over MILICIA. 200 m. from sandy beach. Landing at mouth of river. 38° 3' 0" N.; 13° 32' 55" E.

CASTEL BUONO Station

W., 0.4 Km., railway and road bridges over MALPERTUGIO Torrent. Close to shore. 38° 0' 50" N.; 14° 6' 13" E.

(iv) CEFALU to CAPE ZAFFERANO

CAMPO FELICE DI ROCCELLA Station

(a) E.N.E., 4.6 Km., railway bridge and road bridge over River PILETTO. 0.8 Km. from coast. 38° 0' 30" N.; 13° 55' 28" E.

(b) E.N.E., 1.3 Km., railway and road bridges over ROCCELLA Torrent. 0.5 Km. from beach. 37° 59' 45" N.; 13° 53' 23" E.

GRANDE RIVER

Masonry railway bridge (nine arches, over 500 ft. long) and road bridge (immediately behind). 1.15 Km. from river mouth. Landing, sandy beach in front of the mouth. 37° 58' 25" N.; 13° 49' 30" E.

Between the ROCCELLA Torrent and River GRANDE there are seven small bridges or culverts.

TERMINI IMERESE Station

(a) E., 5.8 Km., railway bridge (160 ft. long) at FIUMETORTO junction, over River TORTO. 0.7 Km. from sandy beach. Railway junction for line running down right bank of River TORTO, 800 m. to east of bridge. Landmark, two groups of storied houses. Landing, left bank of river mouth, safe anchorage anywhere in front. 37° 57' 50" N.; 13° 45' 58" E.

(b) N.W., long railway bridge and road bridge over stream. 30 m. from coast. Landing, sandy beach in front of viaduct. 37° 58' 50" N.; 13° 42' 13" E.

(c) N.W., 1.9 Km., railway bridge (200 ft. long) over River S. LEONARDO. 140 m. from beach. Landing near mouth of river. 37° 59' 30" N.; 13° 41' 13" E.

CAPE ZAFFERANO

(a) S.E., 14.8 Km., road bridge close to coast and railway bridge. 0.6 Km. from coast over BURGIO Torrent. 38° 0' 10" N.; 13° 37' 58" E.

(b) S.S.E., 8.4 Km., railway bridge (65 ft. long) and road bridges (65 ft. long) over S. MICHELE Torrent. 100 m. from sandy beach. Landing at mouth of torrent. 38° 2' 20" N.; 13° 33' 50" E.

(c) S., 6.9 Km., railway bridge (200 ft. long) and road bridge over MILICIA. 200 m. from sandy beach. Landing at mouth of river. 38° 3' 0" N.; 13° 32' 55" E.

(d) S., 6.6 Km., road bridge and railway bridge over CUBO Torrent. 0.3 Km. from coast. 38° 3' 10" N.; 13° 32' 38" E.

(e) S., 5.5 Km., group of three road and two railway bridges over Torrent SPUCCHES, CEFALA, CASTELDACCIA. All roughly 0.4 Km. from coast. Position of middle railway bridges—38° 3' 50" N.; 13° 31' 58" E.

(v) CAPE ZAFFERANO to ISOLA DELLE FEMMINE

CAPE MONGERBINO

S.W., 4.5 Km., road bridge (120 ft. long) and railway bridge (120 ft. long) over FICARAZZI River. 1.4 Km. from coast. Woods, pebble beach, agricultural land. 38° 5' 10" N.; 13° 28' 38" E.

PALERMO, MAIN Station

S.E., 0.75 Km., road and railway bridges (120 ft. long) over River ORETO. 0.8 Km. from shore. 38° 6' 13" N.; 13° 22' 24" E.

40 SECTION IV (3)

(vi) ISOLA DELLE FEMMINE to CAPE S. VITO

CAPACI Station

W.S.W., 0.5 Km., railway and road bridges over TORRENTA Torrent. 1.0 Km. from coast. Also railway bridge over road. Landing in front of CIACHIA tower. $38^{\circ} 10' 5''$ N.; $13^{\circ} 13' 40''$ E.

TERRASINI FAVAROTTA Station

S.W., 0.8 Km., railway and road bridges over stream. 1.2 Km. from shore, behind town. $38^{\circ} 8' 50''$ N.; $13^{\circ} 5' 35''$ E.

CAPE RAMA

S.E., 8.1 Km., railway viaduct (330 ft. long) over River NOCELLA. 2.9 Km. from coast. Landing on beach and ascend river bed. $38^{\circ} 4' 45''$ N.; $13^{\circ} 6' 35''$ E.

TRAPPETO Station

(a) E., 3.5 Km., Railway bridge over River GALINELLA. 2.1 Km. from coast. Visibility from sea uncertain. Landing on beach, follow river bed. $38^{\circ} 3' 15''$ N.; $13^{\circ} 4' 45''$ E.

(b) E.S.E., 2.0 Km., railway bridge over stream at exit of tunnel. 1.6 Km. from shore. $38^{\circ} 3' 30''$ N.; $13^{\circ} 3' 38''$ E.

(c) W.S.W., 1.7 Km., railway bridge (120 ft. long) over River JATO (GIANCaldARA). 0.25 Km. from shore. Landing on beach, ascend river bed. $38^{\circ} 3' 25''$ N.; $13^{\circ} 1' 18''$ E.

BALESTRATE (SICCIARA) Station

(a) W.S.W., 1.4 Km., small bridge over stream. 0.2 Km. from coast. $38^{\circ} 2' 35''$ N.; $12^{\circ} 59' 38''$ E.

(b) W.S.W., 3.0 Km. Bridge over FINOCCHIO Torrent. 0.2 Km. from coast. $38^{\circ} 2' 15''$ N.; $12^{\circ} 58' 45''$ E.

(c) W.S.W., 5.1 Km., small bridge over stream. 0.1 Km. from shore. $38^{\circ} 1' 45''$ N.; $12^{\circ} 57' 25''$ E.

In between (b) and (c) there are also two small bridges or culverts over small streams.

(d) W.S.W., 7.7 Km., bridge over small stream. 0.1 Km. from shore. $38^{\circ} 1' 30''$ N.; $12^{\circ} 55' 38''$ E.

Between (c) and (d) there are two more small bridges close to shore.

WEST COAST : Vulnerable Points :—

TRAPANI to POINT GRANITOLA (Standard-Gauge Railway)

PACECO Station

(a) N.W., 0.45 Km., bridge over canal DI XITTA. 3.6 Km. from sea. $37^{\circ} 59' 35''$ N.; $12^{\circ} 32' 55''$ E.

(b) S.S.E., 0.3 Km., bridge over canal DI BAJETA. 4.0 Km. from sea. $37^{\circ} 59' 6''$ N.; $12^{\circ} 33' 8''$ E.

(c) S.W., 1.25 Km., bridge over stream. 3.5 Km. from sea. $37^{\circ} 58' 45''$ N.; $12^{\circ} 32' 50''$ E.

TRAPPETO Station

- (a) E., 3.5 Km., Railway bridge over River GALINELLA 2.1 Km. from coast. Visibility from sea uncertain. Landing on beach, follow river bed. $38^{\circ} 3' 15''$ N.: $13^{\circ} 4' 45''$ E.
- (b) E.S.E., 2.0 Km., railway bridge over stream at exit of tunnel. 1.6 Km. from shore. $38^{\circ} 3' 30''$ N.: $13^{\circ} 3' 38''$ E.
- (c) W.S.W., 1.7 Km., railway bridge (120 ft. long) over River JATO (GLANCALDARA). 0.25 Km. from shore. Landing on beach, ascend river bed. $38^{\circ} 3' 25''$ N.: $13^{\circ} 1' 18''$ E.

BALESTRATE (SICCIARA) Station

- (a) W.S.W., 1.4 Km., small bridge over stream. 0.2 Km. from coast. $38^{\circ} 2' 35''$ N.: $12^{\circ} 59' 38''$ E.
- (b) W.S.W., 3.0 Km., Bridge over FINOCCHIO Torrent. 0.2 Km. from coast. $38^{\circ} 2' 15''$ N.: $12^{\circ} 58' 45''$ E.
- (c) W.S.W., 5.1 Km., small bridge over stream. 0.1 Km. from shore. $38^{\circ} 1' 45''$ N.: $12^{\circ} 57' 25''$ E.

In between (b) and (c) there are also two small bridges or culverts over small streams.

- (d) W.S.W., 7.7 Km., bridge over small stream. 0.1 Km. from shore. $38^{\circ} 1' 30''$ N.: $12^{\circ} 55' 38''$ E.

Between (c) and (d) there are two more small bridges close to shore.

WEST COAST: Vulnerable Points:—

TRAPANI to POINT GRANITOLA (Standard-Gauge Railway)

PACECO Station

- (a) N.W., 0.45 Km., bridge over canal DI XITTA. 3.6 Km. from sea. $37^{\circ} 59' 35''$ N.: $12^{\circ} 32' 55''$ E.
- (b) S.S.E., 0.3 Km., bridge over canal DI BAJETA. 4.0 Km. from sea. $37^{\circ} 59' 6''$ N.: $12^{\circ} 33' 8''$ E.
- (c) S.W., 1.25 Km., bridge over stream. 3.5 Km. from sea. $37^{\circ} 58' 45''$ N.: $12^{\circ} 32' 30''$ E. Salt pans at exit of canals to sea.
- (d) S.W., 3.0 Km., bridge over River VERDERME. 2.85 Km. from shore. $37^{\circ} 58' 9''$ N.: $12^{\circ} 31' 45''$ E.

TORRE DI MEZZO

E., 1.5 Km., bridge over River S. FRANCESCO. 1.2 Km. from shore. Salt pans at mouth of river in inlet. $37^{\circ} 56' 49''$ N.: $12^{\circ} 30' 25''$ E.

Mouth of River MARSALA

Railway bridge and road bridge over River MARSALA. 0.85 Km. from shore. Landing at mouth, vineyards. $37^{\circ} 45' 54''$ N.: $12^{\circ} 27' 56''$ E.

MAZARA Station

S.E., 3.9 Km., bridge over ARENA River. 1.5 Km. from coast. Landing at mouth. $37^{\circ} 38' 0''$ N.: $12^{\circ} 37' 23''$ E.

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SOUTH COAST : Vulnerable Points :—

POINT GRANITOLA to LICATA

CASTELVETRANO to PORT EMPEDOCLE (narrow-gauge railway)

SELINUNTE (MARINELLA) Station

E., 2.3 Km., railway bridge (164 ft.). 0.5 Km. from coast. Landing in front of mouth. Curtain of trees (2 Km. broad) at mouth. Railway follows coast between SELINUNTE AND PORTO PALO, protected from sand by palisades hiding it at times from sight from the sea. $37^{\circ} 34' 55''$ N.; $12^{\circ} 51' 58''$ E.

CAPE S. MARCO Lighthouse

N.N.W., 5.6 Km., railway bridge over RIVER CARBO. 0.6 Km. from coast. $37^{\circ} 32' 25''$ N.; $12^{\circ} 59' 38''$ E.

SCIACCA Station

E., 5.6 Km., road and railway bridges over CARABALLACE Torrent steep sided valley. 2.5 Km. from mouth. Landmark, DEL BARONE tower. Landing near tower. $37^{\circ} 30' 45''$ N.; $13^{\circ} 8' 38''$ E.

Mouth of RIVER VERDURA

(a) N.N.W., 3.4 Km., railway and road bridges over BELLAPIETRA River. Tunnels either side. 1.0 Km. from coast. $37^{\circ} 29' 25''$ N.; $13^{\circ} 10' 58''$ E.

(b) N., 1.3 Km., railway viaduct (245 ft. long). 1.0 Km. from coast. Landmark. VERDURA tower : from the west of this the viaduct appears end on, $37^{\circ} 28' 30''$ N.; $13^{\circ} 12' 13''$ E.

SICULIANA MARINA

Railway and road bridge over DEL CANNE Torrent. 0.4 Km. from coast. $37^{\circ} 20' 15''$ N.; $13^{\circ} 23' 45''$ E.

PORTO EMPEDOCLE

Base of W. Mole. N.W., 0.7 Km., railway and road bridges over torrent 0.2 Km. from shore. In the port there is an electric power station near shore. $37^{\circ} 17' 20''$ N.; $13^{\circ} 30' 58''$ E.

LICATA to SIRACUSA (Standard-gauge railway)

LICATA

E. of harbour, railway bridge and reinforced concrete road bridge (three arches) over RIVER SALSO. 0.2 Km. from shore. $37^{\circ} 6' 10''$ N.; $13^{\circ} 56' 38''$ E.

GELA Station

E.S.E., 1.2 Km., road and railway bridges over RIVER GELA. 1.1 Km. from mouth. Landing on beach. $37^{\circ} 3' 50''$ N.; $14^{\circ} 15' 58''$ E.

AVOLA Station

N.E., 6.9 Km., road and railway bridge over RIVER CASSIBILE. 1.0 Km. from shore. $36^{\circ} 57' 0''$ N.; $15^{\circ} 10' 43''$ E.

SIRACUSE CASTELLO MANIACE

W., 3.6 Km., two railway bridges over CANALE MAMMAIABICA (230 ft. long) and RIVER ANAPO. The bridges are 100 m apart. 1.45 Km. from coast

E., 5.6 Km., road and railway bridges over CARABALLACE Torrent steep sided valley. 2.5 Km. from mouth. Landmark, DEL BARONE tower. Landing near tower. 37° 30' 45" N.; 13° 8' 38" E.

Mouth of RIVER VERDURA

- (a) N.N.W., 3.4 Km., railway and road bridges over BELLAPIETRA River. Tunnels either side. 1.0 Km. from coast. 37° 29' 25" N.; 13° 10' 58" E.
- (b) N., 1.3 Km., railway viaduct (245 ft. long). 1.0 Km. from coast. Landmark, VERDURA tower: from the west of this the viaduct appears end on, 37° 28' 30" N.; 13° 12' 13" E.

SICULIANA MARINA

Railway and road bridge over DEL CANNE Torrent. 0.4 Km. from coast. 37° 20' 15" N.; 13° 23' 45" E.

PORTO EMPEDOCLE

Base of W. Mole. N.W., 0.7 Km., railway and road bridges over torrent 0.2 Km. from shore. In the port there is an electric power station near shore. 37° 17' 20" N.; 13° 30' 58" E.

LICATA to SIRACUSA (Standard-gauge railway)

LICATA

E. of harbour, railway bridge and reinforced concrete road bridge (three arches) over RIVER SALSO. 0.2 Km. from shore. 37° 6' 10" N.; 13° 56' 38" E.

GELA Station

E.S.E., 1.2 Km., road and railway bridges over RIVER GELA. 1.1 Km. from mouth. Landing on beach. 37° 3' 50" N.; 14° 15' 58" E.

AVOLA Station

N.E., 6.9 Km., road and railway bridge over RIVER CASSIBILE. 1.0 Km. from shore. 36° 57' 0" N.; 15° 10' 43" E.

SIRACUSE CASTELLO MANIACE

W., 3.6 Km., two railway bridges over CANALE MAMMAIABICA (330 ft. long) and RIVER ANAPO. The bridges are 100 m. apart. 1.45 Km. from coast. Elevated road bridge easily seen from sea. 500 m. from coast. 37° 3' 18" N.; 15° 15' 21" E.

(4) Signal Communications—W/T, L/T and Cable

For W/T information not included in the BERNE List or the Admiralty List of Wireless Signals, see C.B.4004, the contents of which are not otherwise notified.

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Italian Naval Wireless Organization

Italian Naval Wireless Stations are as follows:—

Wireless Headquarters (Centri R/T)

These are situated in the most important Naval Bases, where it was foreseen that a Higher Naval Command might have its Headquarters in time of war. Wireless Headquarters are fitted to carry out all wartime services which may be assigned to them. They have separate Receiving and Sending Stations to permit duplex working. They are well protected and defended and have adequate telephone and telegraph communications and so on.

Principal Wireless Stations (Stazioni R/T principali)

These are situated in some of the most important anchorages, where no Wireless Headquarters exists, and where, at least in time of war, there is the Headquarters of a Naval Command.

These stations are equipped to carry out the war-time services which may be assigned to them but the use of the duplex system is not indispensable.

Secondary Wireless Stations (Stazioni R/T secondarie)

These are situated in coastal or insular localities with which the Navy desires to assure direct wireless communications.

These Stations are equipped to carry out the war-time services which may be assigned to them.

ITALIAN NAVAL WIRELESS ORGANIZATION
MEDITERRANEAN

Naval Command.	Wireless Headquarters.	Principal Wireless Stations.	Secondary Wireless Stations.	Direction Finding Stations.	Wireless Beacons.
LA SPEZIA	LA SPEZIA	PORTO FERRAJO	LIVORNO	ARMA DI TAGGLIA CINQUALE PIOMBINO	—
NAPLES	ROME (also working independently for inter-continental traffic)	NAPLES (separate receiving and sending stations)	—	S. MARINELLA LICOLA	—
LA MADDALENA	CAGLIARI	LA MADDALENA	—	PORTO TORRES OROSEI PULA	—
MESSINA	MESSINA TRAPANI	—	VITTORIA PANTELLERIA LAMPEDUSA USTICA	MILAZZO COZZO SPADARO FAVIGNANA	—
TARANTO	TARANTO	—	—	CROTONE	—
BRINDISI	BRINDISI	—	LACOSTA PELAGOSA	PALASCIA	—
VENICE	VENICE	ANCONA (separate receiving and sending stations)	—	SOTTOMARINA	ANCONA VENICE

ITALIAN NAVAL WIRELESS ORGANIZATION MEDITERRANEAN

Naval Command.	Wireless Headquarters.	Principal Wireless Stations.	Secondary Wireless Stations.	Direction Finding Stations.	Wireless Beacons.
LA SPEZIA	LA SPEZIA	PORTO FERRAJO	LIVORNO	ARMA DI TAGLIA CINQUALE PIOMBINO	—
NAPLES	ROME (also working independently for inter-continental traffic)	NAPLES (separate receiving and sending stations)	—	S. MARINELLA LICOLA	—
LA MADDALENA	CAGLIARI	LA MADDALENA	—	PORTO TORRES OROSEI PULA	—
MESSINA	MESSINA TRAPANI	—	VITTORIA PANTELLERIA LAMPEDUSA USTICA	MILAZZO COZZO SPADARO FAVIGNANA	—
TARANTO	TARANTO	—	—	CROTONE	—
BRINDISI	BRINDISI	—	LACOSTA PELAGOSA	PALASCIA	—
VENICE	VENICE	ANCONA (separate receiving and sending stations)	—	SOTTOMARINA	ANCONA VENICE
POLA	POLA	—	ZARA	—	POLA ZARA
DURAZZO	—	—	SASENO VALONA PORTO EDDA DURAZZO	—	—
LERO	LERO	RHODES (separate receiving and sending stations)	STAMPALLA KASTELORIZO	RODI	—
TRIPOLI	TRIPOLI	—	—	TRIPOLI	—

Submarine Cables

See Fleet Telegraph Chart Folio O.T. (Submarine Telegraph Cables, Mediterranean, Black and Red Seas).

SECTION IV (4) 43

ITALCABLE

The commencement of the Company's lines is at ANZIO, near ROME, whence a line runs to BARCELONA and thence to MALAGA, there being also a direct cable from ANZIO to MALAGA. From MALAGA, a cable goes to the AZORES, where it connects with the other cables to the UNITED STATES. The main ITALCABLE goes from MALAGA through LAS PALMAS, ST. VINCENT, FERNANDO NORONHA, in BRAZIL, to RIO de JANEIRO (the cable does not actually enter RIO, but there is a Station at CAPO CABANA), MONTE VIDEO and BUENOS AIRES. This cable appears to have been constructed in the early days of the Fascist régime, the work being certainly complete by 1929.

Commercially, the line to the AZORES is the most important, since it appears from the Company's Balance Sheets that every year more than half the business was on this route. The SOUTH AMERICAN cable accounted for approximately a fifth of the Company's business but politically it no doubt had much greater importance. This cable is really part of the Fascist Policy of attempting to control Italians who have emigrated, and thus securing powers in countries where they reside. It was inaugurated at about the same time as Marshal BALBO's flight to SOUTH AMERICA. The Italians were anxious to keep control of the very large Italian population in BUENOS AIRES, and other places in SOUTH AMERICA.

The cable was really financed by the Italian Government, which guaranteed the use of the cable up to a certain percentage of its capacity. The Italian Government does not pay on the guarantee, but itself provides the business by sending propaganda. It appears from the Balance Sheets that so far as the SOUTH AMERICAN cable is concerned, between one-half and two-thirds of the takings come from the Italian Government.

All Italian Consular and Diplomatic cables are sent over the Company's lines, and pressure is put upon Italian firms to use the cables. Thus, much business was done between ITALY and ENGLAND by cables being sent to BARCELONA, thence across SPAIN to BILBAO, and so to ENGLAND. The Reports of the Company appear to be those of an ordinary commercial Company, but it is perhaps noteworthy that few details of the actual property and business of the Company are given compared with the Reports of an English Company operating in SOUTH AMERICA. Obviously the Company is dominated by the Italian State. It appears that there is actually one Director nominated by the Italian Government, and one by the Spanish Government. No doubt all those in prominent positions are subject to the supervision of the Italian State. There is no doubt the Italian Government are able to see any messages sent over the Company's cables. Indeed, in GIBRALTAR the Italian Consul would in fact in normal times send all messages from LA LINEA to MALAGA and thence to ITALY. It should, however, be remarked that simply on commercial grounds, it is to the interest of the Italian Government to use this cable so far as possible.

The Company did no intermediate business between BUENOS AIRES, MONTE VIDEO and RIO DE JANEIRO. At LAS PALMAS they were restricted to traffic to Italy; business was picked up at MALAGA for SOUTH AMERICA, the UNITED STATES and ITALY, and also BARCELONA. At MALAGA and BARCELONA the Company had no offices of their own, they could only take business through the Spanish Government offices.

During the Spanish Civil War, the Company's property did not suffer much damage. In MALAGA during the occupation of the town by the Republicans the Italian staff hid until its re-occupation; but most of the staff were by that time Spaniards, and they were Reds, and thus continued to run the Station and to prevent it being damaged. During the more lengthy occupation of BARCELONA, the Italians cut the cable communication with that town, and joined ROME to MALAGA direct, but since the victory of FRANCO, the line to BARCELONA has been resumed.

Another cable runs from ANZIO to LISBON and thence to LA PANNE. Technically it would have been advantageous for the cable to go into a Spanish port, but the Italian Government did not at the time feel certain of SPAIN, and they therefore ringed SPAIN, only having LISBON as a terminal point. The construction of this cable aroused GERMANY.

countries where they reside. It was inaugurated at about the same time as Marshal BAILO's flight to SOUTH AMERICA. The Italians were anxious to keep control of the very large Italian population in BUENOS AIRES, and other places in SOUTH AMERICA.

The cable was really financed by the Italian Government, which guaranteed the use of the cable up to a certain percentage of its capacity. The Italian Government does not pay on the guarantee, but itself provides the business by sending propaganda. It appears from the Balance Sheets that so far as the SOUTH AMERICAN cable is concerned, between one-half and two-thirds of the takings come from the Italian Government.

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Another cable runs from ANZIO to LISBON and thence to LA PANNE. Technically it would have been advantageous for the cable to go into a Spanish port, but the Italian Government did not at the time feel certain of SPAIN, and they therefore ringed SPAIN, only having LISBON as a terminal point. The construction of this cable annoyed GERMANY, as it enabled the Italians to communicate direct with BELGIUM, whereas previously they had to send messages through either FRANCE or GERMANY.

The Company has taken over and are operating a line between PALERMO and CAGLIARI in SARDINIA.

When the cable was constructed, the section between ITALY and MALAGA was made by the Italians. The rest was constructed by British firms.

ALBANIA

There are W/T Stations at TIRANA and SCUTARI.

The principal Towns and Villages are connected by Telegraph. The Telephone System is old and very inefficient. In the outlying districts the Gendarmerie Posts are all connected by their own Telephone system.

DURAZZO is connected with BARI by cable, and VALONA with OTRANTO. SASENO is also connected by cable with ITALY.

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SECTION V

BASE FACILITIES AND MAINTENANCE OF THE FLEET

(1) Naval Dockyards and Bases

The Italian Navy has two main bases, SPEZIA on the west coast and TARANTO on the south-east.

Particulars of all Main and Subsidiary Bases and Defended Naval Stations, with measurements of the Docks they contain, are summarized in para. (1) B of this chapter. Full details are contained in Section VI under the Ports concerned.

(1) A. Dock Facilities for Specified Classes of Ships

(For Dock Measurements see under Port concerned in para. (1) B of this chapter.)

(i) "LITTORIO" and "ROMA" Class Battleships:—

Three Docks 1 at GENOA.
1 at TARANTO.
1 at VENICE.

Docks under construction .. 1 at NAPLES.
1 at TARANTO.

(ii) "CONTE DI CAVOUR" and "ANDREA DUILIO" (reconstructed) Classes:—

Six Docks 2 at GENOA.

1 at SAN MARCO (TRIESTE) (Floating Dock).

1 at SPEZIA (No. 5 Dock).

1 at TARANTO.

1 at VENICE.

Docks under construction .. 1 at NAPLES.

1 at TARANTO.

(iii) "POLA," "BOLZANO" and "TRENTO" Classes:—

Nine Docks 2 at GENOA.

1 at NAPLES.

1 at SAN MARCO, TRIESTE (Floating Dock).

2 at SPEZIA.

2 at TARANTO.

1 at VENICE.

Docks under construction .. 1 at NAPLES.

1 at TARANTO.

(iv) "GARIBALDI," "MONTECUCCOLI" and "EUGENIO DI SAVOIA" Cruiser Classes:—

The same as for (iii) "POLA" Class, with the addition of a Floating Dock at MONFALCONE (TRIESTE).

(v) "ARMANDO DIAZ" Class:—

The same as for (iii) and (iv), with the probable addition of a Dry Dock at PALERMO.

(1) B. Main and Secondary Bases and Naval Stations with Docks

(In alphabetic order under the following main headings.)

ITALIAN MAINLAND

(i) "LITTORIO" and "ROMA" Class Battleships:

Three Docks 1 at GENOA.
 1 at TARANTO.
 1 at VENICE.
 Docks under construction .. 1 at NAPLES.
 1 at TARANTO.

(ii) "CONTE DI CAVOUR" and "ANDREA DUILIO" (reconstructed) Classes:—

Six Docks 2 at GENOA.
 1 at SAN MARCO (TRIESTE) (Floating Dock).
 1 at SPEZIA (No. 5 Dock).
 1 at TARANTO.
 1 at VENICE.
 Docks under construction .. 1 at NAPLES.
 1 at TARANTO.

(iii) "POLA," "BOLZANO" and "TRENTO" Classes:—

Nine Docks 2 at GENOA.
 1 at NAPLES.
 1 at SAN MARCO, TRIESTE (Floating Dock).
 2 at SPEZIA.
 2 at TARANTO.
 1 at VENICE.
 Docks under construction .. 1 at NAPLES.
 1 at TARANTO.

(iv) "GARIBALDI," "MONTECUCCOLI" and "EUGENIO DI SAVOIA" Cruiser Classes:—

The same as for (iii) "POLA" Class, with the addition of a Floating Dock at MONFALCONE (TRIESTE).

(v) "ARMANDO DIAZ" Class:—

The same as for (iii) and (iv), with the probable addition of a Dry Dock at PALERMO.

(1) B. Main and Secondary Bases and Naval Stations with Docks

(In alphabetic order under the following main headings.)

- (a) ITALIAN MAINLAND.
- (b) SARDINIA.
- (c) SICILY.
- (d) DODECANESE.
- (e) ALBANIA.

(a) ITALIAN MAINLAND

BRINDISI

A Destroyer and Submarine Base within easy reach of TARANTO. It is a Sub-Command of the Ionian and Lower Adriatic Command. There is a large Torpedo Store and Repair Shop. The base is strongly defended against all forms of attack.

Commercial Floating Dock ..	Lift.	Formerly believed to be 4,800 tons; now believed to be considerably less than this figure.
Naval Floating Dock, G.O.11 ..		2,000 tons.

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CASTELLAMARE

	Length.	Width at entrance.	Depth.	Lifting capacity.
	ft. in.	ft. in.	ft. in.	tons.
Floating Dock No. 1	380 0	46 0	39 4	2,000
Floating Dock No. 2	347 9	85 4		1,600

CIVITA VECCHIA

	Extreme length.	Width of top at entrance.	Depth at sill.	Lifting capacity.
	ft. in.	ft. in.	ft. in.	tons.
Floating Dock	232 8	36 10	16 1	500

FERRAJO (Porto), ELBA

A Secondary Base for Submarines and Light Craft, with facilities for refuelling. Suitable anchorage for Cruisers and a very few Capital Ships.

The Port is defended by a Boom, and Coast Defence Batteries up to 6-in. calibre. There are strong A.A. defences by the ILVA Works.

FIUME

	Extreme length.	Width of entrance.	Depth on blocks (aft and forward).	Lifting capacity.
	ft. in.	ft. in.	ft.	
Floating dock	309 5	65 7	22	4,550 tons. (Can lift vessels of 6,500 tons register.)

GAETA

A good Fleet Anchorage. There are no repair facilities. The gun defences are considerable.

GENOA

After the bombardment of GENOA in February, 1941, the defences of the Port were reported to be considerably increased.

	Extreme length.	Length at top.	Width at mean springs.	Width at top.	Depth at mean HW at sill.	Depth on blocks.
	ft.	ft.	ft. in.	ft. in.	ft. in.	ft. in.
Dry Dock No. 1	571	561	81 0	82 8	28 6	—
Dry Dock No. 2	702	?	60 0	60 7	26 0	—

FERRAJO (Porto), ELBA

A Secondary Base for Submarines and Light Craft, with facilities for refuelling. Suitable anchorage for Cruisers and a very few Capital Ships.

The Port is defended by a Boom, and Coast Defence Batteries up to 6-in. calibre. There are strong A.A. defences by the ILVA Works.

FIUME

	Extreme length.	Width of entrance.	Depth on blocks (aft and forward).	Lifting capacity.
Floating dock	ft. in. 309 5	ft. in. 65 7	ft. 22	4,550 tons. (Can lift vessels of 6,500 tons register.)

GAETA

A good Fleet Anchorage. There are no repair facilities. The gun defences are considerable.

GENOA

After the bombardment of GENOA in February, 1941, the defences of the Port were reported to be considerably increased.

	Extreme length.	Length at top.	Width at springs.	Width at top.	Depth at mean HW at sill.	Depth on blocks.
Dry Dock No. 1	ft. 571	ft. 561	ft. in. 81 0	ft. in. 82 8	ft. in. 28 6	ft. in. —
Dry Dock No. 2	702	?	60 0	60 7	26 0	—
(Can be divided into 2 or 3 docks.)						
Dry Dock No. 3	?	853	105 0	?	36 0	—
Dry Dock No. 4	919	?	135 9	?	?	42 7
(Length may eventually be increased to 1,148 ft.)						

	Length.	Width.	Depth.
Small Dry Dock	ft. in. 274 0	ft. 72	ft. 23
Municipal Dock	280 5	ft. in. 72 2	ft. 20
		Width at entrance.	Depth at M.W.L. and on blocks.

(GENOA Docks have no tides: the maximum difference of water level experienced is 7½ inches.)

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LIVORNO

LIVORNO is almost entirely a Commercial Port. Its coast defences have been considerably increased and now include a number of 5-in. and 6-in. gun batteries.

Dry dock.	Length.	Breadth.	Depth over sill.
DARSENА	440 ft. (bottom)	50 ft. (bottom)	18½ ft. (Lloyds (1940) gives 21 ft.)
NUOVA	447 ft. (sea level)	72 ft. (sea level)	

(Note.—Vessels of 55-ft. 9-in. beam with a flat keel can enter.)

NAPLES

The Headquarters of the Lower Tyrrhenian Command. The Second Submarine Group is based there.

The Base is defended by Booms and A/S Net Defence and the Gulf of NAPLES is mined. Following the use of Naples as an embarkation point for Axis troops to Libya, the gun defences are reported to be increased, and the A.A. Defence is considerable.

	Overall length.	Length on bottom.	Width at sill.	Width at top.	Depth on blocks.
Government Dry Dock	247	240 ft. 10	ft. in.	ft. in.	ft.
Commercial Dry Dock No. 1	?	664 0	77 0	62 4	(Depth at sill 21 ft. 4 in.)
Commercial Dry Dock No. 2	?	371 0	58 6	94 9	30
		Overall length ft.	Length on bottom ft.	Width ft.	Depth at sill ft.
Dry dock under construction (MOLO CESAREO CONSOLE)	..	1,145	1,053	131	43 6
(Will accommodate a 35,000-ton battleship.)					
Small Floating Dock	..	..	Length 400 ft.	Width 80 ft. (approx.)	

PANTELLERIA

Used by M.A.S.

There is a considerable number of coast defence guns (up to 6-in. calibre) and A.A. defences.

POLA

A secondary Naval Base, a Base for Submarine Training Flotilla, a Repair Base for German and Italian Submarines, Naval Training Centre and a Sub-Command of the Upper Adriatic Command. The Base is strongly defended against all forms of attack.

	Length to coping head.	Length on bottom.	Width.	Depth at sill.
Dry Dock No. 1	453	410	ft.	ft.
Dry Dock No. 2	402	350	78	26
			86	30
Dry dock for Floating docks	..	Length 546 ft.	Width 171 ft. 3 in.	Depth at sill 7 ft. 9 in.
Floating dock No. 10	..	311 ft.	35 ft.	16 ft.

SPEZIA

SPEZIA is the Headquarters of the Upper Tyrrhenian Command. It provides accommodation for a large Fleet and is well equipped to carry out all repairs. It is the First Submarine Group and M.A.S. Base and has considerable Tankage for Oil Fuel. It is strongly defended against all forms of attack.

	Overall length.	Length on bottom.	Width at sill.	Width at top.	Depth on blocks.
Government Dry Dock ..	ft. 247	ft. in. 240 10	ft. in. —	ft. in. 62 4	ft. (Depth at sill 21 ft. 4 in.)
Commercial Dry Dock No. 1 ..	?	664 0	77 0	94 9	30
Commercial Dry Dock No. 2 ..	?	371 0	58 6	?	22
Dry dock under construction (MOLO CESAREO CONSOLE) ..	..	Overall length. ft. 1,145	Length on bottom. ft. 1,053	Width. ft. 131	Depth at sill. ft. 43 6
(Will accommodate a 35,000-ton battleship.)	..	..	..	..	..
Small Floating Dock ..	..	..	Length. 400 ft.	Width. 80 ft. (approx.)	..

PANTELLERIA

Used by M.A.S.

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POLA

A secondary Naval Base, a Base for Submarine Training Flotilla, a Repair Base for German and Italian Submarines, Naval Training Centre and a Sub-Command of the Upper Adriatic Command. The Base is strongly defended against all forms of attack.

	Length to coping head.	Length on bottom.	Width.	Depth at sill.
Dry Dock No. 1 ..	ft. 453	ft. 410	ft. 78	ft. 26
Dry Dock No. 2 ..	402	350	86	30
Dry dock for Floating docks ..	..	Length. 546 ft.	Width. 3 in.	Depth at sill. 7 ft. 9 in.
Floating dock No. 10 ..	..	311 ft.	35 ft.	16 ft.

SPEZIA

SPEZIA is the Headquarters of the Upper Tyrrhenian Command. It provides accommodation for a large Fleet and is well equipped to carry out all repairs. It is the First Submarine Group and M.A.S. Base and has considerable Tankage for Oil Fuel. It is strongly defended against all forms of attack.

The Naval Dockyard possesses six Graving Docks of the following dimensions:—

	Length inside caisson to coping head.	Length on bottom.	Coping width.	Depth over sill.	Cranes.
Graving dock No. 1 ..	ft. 354	ft. 341	ft. in. 70 8	ft. 29	10-ton electric cranes serve G.Ds. 1-4.
Graving dock No. 2 ..	428	410	76 5	29	
Graving dock No. 3 ..	428	410	76 5	29	
Graving dock No. 4 ..	354	341	71 6	29	
Graving dock No. 5 ..	702	687	105 6	33	
(Can take a "Cavour" class battleship.)					
Graving dock No. 6 ..	702	687	100 0 (app.)	32	
Floating dock for submarines ..	Length. 226 ft. 4 in.	Width. 36 ft.	Lift. 500 tons.		

There are two Steel Pontons, 105 ft. long and 125 tons lifting capacity. There are other small floating docks of which no particulars are available.

SECTION V (1) 47

TARANTO

The most important Naval Base in ITALY, on which the main Battle Squadron and the 4th Submarine Group are based. It is also the Headquarters of the Ionian and Lower Adriatic Commands. It provides accommodation for a large Fleet and is well equipped to carry out all repairs. It has been estimated that the Yard can deal simultaneously with the normal refitting of one Battleship, one Cruiser and four Destroyers or Submarines. The Base includes a Torpedo Range and large Tankage for Oil Fuel.

The Shipyard of "FRANCO TOSI" is situated close to the Naval Base (see Section V (2))
The Base is strongly defended against all forms of attack.

	Overall.	Width at top of entrance.	Depth at sill.	Width at sill.	Width at 13 ft. above sill.	Remarks.
ft.	ft.	ft. in.	ft. in.	ft. in.	ft. in.	
GENERALE E. FERRATI Dry Dock No. 1.	820	133 0	39 4	115 5	128 6	Can take a 35,000-ton Battleship.
PRINCIPE DI NAPOLI Dry Dock No. 2.	711	109 6	32 4	81 0	96 5	Can take a 10,000-ton Cruiser.

A Graving Dock is under construction, position 2,300 yards, 105° from SECCA della TARANTOLA Beacon. The length of the excavation is, at present, 760 feet, and its breadth is 214 feet, but further excavation will be carried out to seaward. The work is not likely to be completed before May, 1942.

	Overall length.	Width at top.	Width at sill.	Depth at sill.	Lift.
ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	tons.
Floating Dock No. G.O.2	147 7	29 6	26 3	10 10	150
Floating Dock No. G.O.4	105 0	26 5	23 4	9 2	100
Floating Dock No. G.O.9	217 9	37 0	32 0	?	450
Floating Dock No. G.O.11	?	?	?	?	2,000
Floating Dock No. G.O.13	459 6	90 7	65 1	33 4	15,000
(G.O. 13 was the late No. 15 at POLA.)					
Floating Dock No. G.O.18	328 0	—	—	—	1,200

TRIESTE

(A) MONFALCONE

	Overall length.	Inside width at entrance.	Width at top.	Depth at blocks.	Lift.
ft.	ft. in.	ft. in.	ft.	ft.	tons.
Floating Dock No. 1	541	?	91	21	13,000
Floating Dock No. 2	229	67 0	?	21	2,000
Floating Dock No. 3	172	55 8 (clear)	?	?	1,300

(B) SAN MARCO

	Extreme length.	Length on blocks.	Width at bottom.	Clear width.	Depth on blocks.	Depth on bottom.	Lift.
ft.	ft.	ft.	ft.	ft. in.	ft. in.	ft. in.	tons.
Floating Dock No. 22	584	538	94	118	110 7	35 6	2,000

A Graving Dock is under construction, position 2,300 yards, 105° from SECCA della TARANTOLA Beacon. The length of the excavation is, at present, 760 feet, and its breadth is 214 feet, but further excavation will be carried out to seaward. The work is not likely to be completed before May, 1942.

	Overall length.	Width at top.	Width at sill.	Depth at sill.	Lift.
Floating Dock No. G.O.2	147 7	29 6	26 3	10 16	150
Floating Dock No. G.O.4	105 0	26 5	23 4	9 2	100
Floating Dock No. G.O.9	217 9	37 0	32 0	?	450
Floating Dock No. G.O.11	?	?	?	?	2,000
Floating Dock No. G.O.13	459 6	90 7	65 1	33 4	15,000
(G.O. 13 was the late No. 15 at POLA.)					
Floating Dock No. G.O.18	328 0	—	—	—	1,200

TRIESTE
(A) **MONFALCONE**

	Overall length.	Inside width at entrance.	Width at top.	Depth at blocks.	Lift.
Floating Dock No. 1	541	ft. in. ?	ft. 91	ft. 21	tons 13,000
Floating Dock No. 2	229	67 0	?	21	2,000
Floating Dock No. 3	172	55 8 (clear)	?	?	1,300

(B) **SAN MARCO**

	Extreme length.	Length on blocks.	Width at bottom.	Width at top.	Clear width.	Depth on blocks.	Depth on bottom.	Lift.
Floating Dock No. 22	ft. 584	ft. 538	ft. 94	ft. 118	ft. in. 110 7	ft. in. 35 6	ft. in. 39 6	tons 21,500

(C) **SAN ROCCO**

	Extreme length.	Length on bottom.	Width on bottom.	Depth on blocks.	Depth at sill.
Dry Dock	ft. 414	ft. 394	ft. 60	ft. 21	ft. 25

(D) **Other Establishments**

	Overall length.	Width of entrance at top.	Depth at sill.
Graving Dock No. 1	ft. 456	ft. 73	ft. in. 21 0
Graving Dock No. 2	362	67	23 2

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VENICE

A secondary Naval Base, strongly defended against all forms of attack, and the Headquarters of the Upper Adriatic Command. The Naval Establishment has been considerably reduced. The Dockyard deals with the maintenance of the M.A.S. Flotilla, and the Local Defence and Training Flotillas in the Command. There are three Government Dry Docks:—

	Extreme length.	Length on floor.	Breadth at entrance.	Depth of water over sill at H.W.O.S.T.
(1) Principe de Piedmont (The "Vittorio Veneto" and "Conte di Savoia" have both docked here.)	ft. in. 820 2	ft. in. 810 4	ft. in. 117 9	ft. in. 39 3

	Length on top.	Length on floor.	Width at sill.	Depth at sill.	Depth on blocks, (forward).
(2) MAGGIORE	ft. in. 526 0	ft. 499	ft. in. 70 0	ft. in. 29 6	ft. in. 26 1
(3) MINORE	ft. in. 298 9	ft. 272	ft. in. 32 9	ft. in. 19 7	ft. in. 16 7
					ft. in. 23 3
					ft. in. 14 3

(b) SARDINIA

See C.B. 4096G: I.S.I.S. Report

(c) SICILY

See C.B. 4096H: I.S.I.S. Report

(d) DODECANESE

LERO Island

An important Naval and Air Base. Port LAKE is the main Harbour and can accommodate two Capital Ships and a Cruiser Squadron. There are two other important Harbours in the Island: PARTHANI Bay and ALINDA Bay. There are good repair facilities and considerable Storage for Oil Fuel.

The Base is strongly defended against all forms of attack.

Floating Dock: Lift, 2,300 tons. This is reported to have been destroyed by air attack.

RHODES

RHODES is the largest and most important of the DODECANESE Islands. It is the Headquarters of the AEGEAN Naval Command. It is an important Landplane Base and a minor Naval Base.

The Island is heavily defended against attack.

(e) ALBANIA

SASENO Island (VALONA)

This small Island, off VALONA Bay, is used occasionally for Destroyers and Submarines. It is defended by 12-in. and smaller coast defence batteries, which take a part in controlling the entrance to the Adriatic.

(2) Principal Commercial Dockyards and Repair Bases

All ships of the Royal Navy are built by commercial firms. The three principal shipbuilding firms are the following:—

(a) Odessa Shipyard. This firm has built the largest of the Royal Navy's fleet.

	on top.	on floor.	at sill.	at sill.	on blocks.	on blocks.	(forward).
(2) MAGGIORE	ft. in.	ft.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
(3) MINORE	526 0	499	70 0	29 6	26 1	23 3	14 3
	298 9	272	32 9	19 7	16 7	14 3	

(b) SARDINIA

See C.B. 4096G: I.S.I.S. Report

(c) SICILY

See C.B. 4096H: I.S.I.S. Report

(d) DODECANESE

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The Base is strongly defended against all forms of attack.

Floating Dock: Lift, 2,300 tons. This is reported to have been destroyed by air attack.

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SASENO Island (VALONA)

This small Island, off VALONA Bay, is used occasionally for Destroyers and Submarines. It is defended by 12-in. and smaller coast defence batteries, which take a part in controlling the entrance to the Adriatic.

(2) Principal Commercial Dockyards and Repair Bases

All ships of the Royal Navy are built by commercial firms. The three principal shipbuilding firms are the following:—

(a) *Odero-Terni-Orlando*.—This firm has Yards at GENOA (SESTRI), LEGHORN and SPEZIA (MUGGIANO), though there has been no building carried out for some time at the GENOA Yard.

(b) *Ansaldo*.—This firm has one Yard situated at GENOA (SESTRI).

(c) *Cantieri Riuniti Dell'Adriatico*.—This firm has three Yards, all at TRIESTE, namely, the MONFALCONE, SAN MARCO and SAN ROCCO Yards, though there has been no building carried out recently at the SAN ROCCO Yard.

Other firms, shown in order of importance, are the following:—

(d) *Cantieri Navali Riuniti*.—This firm has yards at ANCONA and PALERMO.

(e) *Cantieri Navali Del Tirreno* at RIVA TRIGOSO.—This firm works in conjunction with Odero-Terni-Orlando.

(f) *Baccini E Scale Napoletani (Naval Meccanica)* at NAPLES.

(g) *Cantieri Del Quarnero* at FIUME.

(h) *Cantieri Navali Franco Tosi* at Taranto.

(i) *Cantieri Navali Ed Officine Meccaniche* at VENICE.

(j) *Cantieri Navali Scoglio Olivi* at POLA.

There are other small shipbuilding firms which are mentioned in the succeeding paragraphs.

SECTION V (2) 49

The following is a list of Commercial Dockyards shown alphabetically and short notes are appended showing the capacities of existing firms.

ANCONA

Cantieri Navali Riuniti

Four Building Slips.—520 ft., 408 ft. and 327 ft. long and one smaller one. Government Slipway, 213 ft. long; Cradle, 100 ft. long; Lift, 500 tons. Two Light Cruisers are nearing completion. Has own Engine and Boiler Works but cannot make large castings. Employs 1,500 to 1,800 men.

CASTELLAMARE

"Navalmecanica"

The old Royal Dockyard at CASTELLAMARE was purchased by this company (which owns two further yards; see under "NAPLES" below) in 1939. Since 1918, only one Cruiser and a few small craft have been built, but in pre-war days (1914/18) some of the largest units in the Fleet were built there. Refitting and repairs to small craft are carried out.

Consorzio Construzione Navali

Two Building Slips.—460 ft. and 328 ft. long. Merchant Vessels up to 7,000 tons are built.

GATANIA

Cantieri Biriaci

One Building Slip.—320 ft. long.

Reported capable of building up to 1,400 tons and repairs. Has own Engine and Boiler Works.

CHIOGGIA (VENICE)

Cantieri Navali Poli

One Building Slip.—510 ft. long.

FIUME

Cantieri Navali del Quarnero

Six Building Slips.—Two 756 ft. and four 492 ft. long.

Has built Destroyers and Scouts, and most recently a number of Tugs.

GENOA

Ansaldo (SESTRI PONENTE Yard)

Seven Permanent Building Slips.—984 ft., 920 ft., 656 ft. and 492 ft. long, and three small ones.

About ten small Temporary Building Slips, the number of which varies.

Up to December, 1937, the Yard had built 273 ships, of which 187 were Warships (25 being for Foreign Navies), representing a displacement of 323,000 tons, in addition to 83 Merchant Ships totalling 327,000 tons. The Yard built the Battleship "GIULIO CESARE" and the two 35,000-ton Battleships "LITTORIO" and "IMPERO," and reconstructed the "DUILIO." (The work on the "LITTORIO" and the "DUILIO" was substantially completed at this Yard by the time they left GENOA shortly before 11th June, 1940. The "IMPERO" was moved at the same time, having been launched on 15th November, 1939.)

Important vessels built for the Italian Merchant Navy include the "AUSONIA" and "REX." The equipment of the Shipyard is of the most modern type and the construction complex includes Engineering Works at SAN PIER D'ARENA and Electrical, Steel, Metallurgical and Ordnance Works. The Establishment has an area of 140,000 square yards, of which 55,000 square yards is occupied by Workshops.

Consorzio Construzione Navali

Two Building Slips—460 ft. and 328 ft. long.
Merchant Vessels up to 7,000 tons are built.

GATANIA

Cantieri Biriaci

One Building Slip.—320 ft. long.

Reported capable of building up to 1,400 tons and repairs. Has own Engine and Boiler Works.

CHIOGGIA (VENICE)

Cantieri Navali Poli

One Building Slip.—510 ft. long.

FIUME

Cantieri Navali del Quarnaro

Six Building Slips.—Two 756 ft. and four 492 ft. long.

Has built Destroyers and Scouts, and most recently a number of Tugs.

GENOA

Ansaldo (SESTRI PONENTE Yard)

Seven Permanent Building Slips.—984 ft., 820 ft., 656 ft. and 492 ft. long, and three small ones.

About ten small Temporary Building Slips, the number of which varies.

Up to December, 1937, the Yard had built 273 ships, of which 187 were Warships (25 being for Foreign Navies), representing a displacement of 323,000 tons, in addition to 83 Merchant Ships totalling 327,000 tons. The Yard built the Battleship "GIULIO CESARE" and the two 35,000-ton Battleships "LITTORIO" and "IMPERO" and reconstructed the "DUILIO." (The work on the "LITTORIO" and the "DUILIO" was substantially completed at this Yard by the time they left GENOA shortly before 11th June, 1940. The "IMPERO" was moved at the same time, having been launched on 15th November, 1939.)

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"Odero-Terni-Orlando" (at SESTRI)

Six Building Slips.—Each about 500 ft. long.

The Slips appear to be derelict and no ship has been launched from them since 1932. Previously, War Vessels up to 7,000 tons and Merchant Vessels up to 8,000 tons have been built. This is one of the principal establishments for the construction of steam engines.

Other Establishments

There are two smaller shipbuilding firms, "Societa Anonima Cantieri Cernaia" at VOLTRI and "Cantieri Federale per Costruzioni Navali" at PIETRA LIGURE. Both firms have built Merchant Vessels up to 6,000 tons and the latter has four fitting-out berths.

LIVORNO

"Odero-Terni-Orlando"

Four Building Slips.—One of these is capable of building cruisers of 500 ft. Also one covered slip, extreme length, 280 ft. length of cradle, 250 ft.; depth on blocks: forward, 21 ft., aft, 24 ft.; lifting power, 1,500 tons.

(C-46758)

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This Yard has great traditions in shipbuilding. It built the first ship having an iron hull and up to 1938, since its inception in 1865, had built 528 ships, of which 327 were Warships for various Navies with a total displacement of 495,000 tons, the remaining 201 being Merchant Vessels with a total displacement of 617,000 tons. Cruisers up to 10,000 tons have been built and the Yard is now almost completely devoted to the building of Warships. The Yard has its own Engine and Boiler Works.

Other Establishments

"*Cantieri Picchiotti*" at LIMITE and "*Costruzione Meccaniche Aeronautiche S.A.*" situated at the mouth of the River ARNO, build M.A.S. The former works consist of two shops, the probable production capacity being two hulls in each shop.

NAPLES

"*Navalmecanica*"

This company was founded in 1939 and comprises the "Bacini e Scali Napoletani" and "Pattison" Yards at NAPLES, in addition to the ex-Royal Dockyard at CASTELLAMARE.

Three Building Slips, each 492 ft. long. (Bacini e Scali Napoletani.)

The Pattison Shipyard is in process of reconstruction, which will enable it to build ships up to 10,000 tons. It has its own Engine and Boiler Works, and specialises in the construction of Torpedo Craft.

PALERMO

Cantieri Navali Riuniti

Two Building Slips.—524 ft. and 505 ft. long.

Patent Slip.—A patent slip, 480 ft. long, with a cradle of 234 ft., exists but was out of commission in January, 1939.

Now building, one Light Cruiser. Has built Submarines, Destroyers and ships up to 6,300 tons. Has own Engine and Boiler Works.

POLA

"*Cantieri Navali Scoglio Olivi*"

Three Building Slips, one of which is 590 ft. long.

No Naval building has been carried out for some time. The Dockyard is practically closed down and is used only for small repair work for ships based on the Port. It appears however to be maintained in a state of readiness.

RIMINI

There is a Patent Slip which can take vessels up to 300 tons. The length of the slip is 137 ft. at floor head.

RIVA TRIGOSO

"*Cantieri del Tirreno*"

Ten Building Slips.—Four 650 ft., four 328 ft. and two 197 ft. long.

Merchant Vessels up to 12,000 tons are built. Has own Engine and Boiler Works. The firm is reported to work with "Odero-Terni-Orlando."

SPEZIA

"*Odero-Terni-Orlando*" at MUGGLIANO

The number of Building Slips is uncertain. There is one long one of 1,084 ft. and probably 1,500 ft. There are two each 400 ft. long, to take six torpedo boats. There are a number

This company was founded in 1835 and comprises the ex-Royal Dockyard at CASTELLAMARE.

"Partison" Yards at NAPLES, in addition to the ex-Royal Dockyard at CASTELLAMARE.
Three Building Slips, each 492 ft. long. (Bacini e Scali Napoletani.)
The Pattison Shipyard is in process of reconstruction, which will enable it to build ships up to 10,000 tons. It has its own Engine and Boiler Works, and specialises in the construction of Torpedo Craft.

PALERMO

Cantieri Navali Riuniti

Two Building Slips.—524 ft. and 505 ft. long.
Patent Slip.—A patent slip, 480 ft. long, with a cradle of 234 ft., exists but was out of commission in January, 1939.
Now building, one Light Cruiser. Has built Submarines, Destroyers and ships up to 6,300 tons. Has own Engine and Boiler Works.

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Merchant Vessels up to 12,000 tons are built. Has own Engine and Boiler Works. The firm is reported to work with "Odero-Terni-Orlando."

SPEZIA

"Odero-Terni-Orlando" at MUGGLIANO

The number of Building Slips is uncertain. There is one long one of 1,084 ft. and probably one of 656 ft. There are two, each 400 ft. long, to take six torpedo boats. There are a number of Slips 263 ft. long, possibly as many as 15.

War Vessels of all classes can be built, but the yard specialises in submarines. M.A.S. and Merchant Vessels up to 9,000 tons are built. The Yard has its own Engine and Boiler Works and Testing Dock for Submarines. 5,000 men employed.

TARANTO

"Cantieri Navali Franco Tosi"

Ten Building Slips.—One 500 ft., three 480 ft., two 260 ft., one 315 ft., 3, probably 4 Submarine Slips, length not known.

In addition to the slips in TOSI'S Yard, there is a building slip 365 ft. long in the Naval Dock between the two Dry Docks.

Has five, possibly six fitting-out berths. Specialises in Submarines. Also builds Merchant Vessels up to 9,000 tons. Has own engineering works.

The Eastern half of the Yard was altered considerably and facilities increased in 1941.

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TRIESTE

"Cantieri Riuniti dell'Adriatico"

This firm has an estimated annual capacity of 160,000 tons. It owns 17 fitting-out berths and the following three Yards:—

Monfalcone

Eight Building Slips.—Two 888 ft. and six 525 ft. long.

Considered the best organized and most progressive Shipyard in ITALY. Can build all types of War Vessel, but specialises in submarines. It takes first place in the world for the number of submarines built since the war (1914-18), and constructed 25 during the three years commencing January, 1934, and six more up to June, 1940. It is the leading Shipyard in ITALY for building Merchant Vessels. 12,000 men are employed.

San Marco

Four Building Slips.—888 ft., 653 ft., and two 526 ft. long.

Built the 35,000-ton Battleship "VITTORIO VENETO," and is now building the 35,000-ton Battleship "ROMA." Can build all types of War Vessel and equip them complete except for guns and armour. Builds Merchant Ships up to 25,000 tons.

San Rocco

Five Building Slips.—Two 550 ft., one 450 ft., one 400 ft., and one 350 ft. long.

War Vessels, including Cruisers up to 10,000 tons, have been built and also Merchant Vessels. Recently no building has been carried out and the Yard has been used solely for refitting ships of the Lloyd Triestino and associated lines. It is possible that the Yard will shortly recommence building Merchant Ships.

Other Establishments

The "Arsenale del Lloyd Triestino," which has its own Engine and Boiler Works, builds Merchant Vessels up to 7,000 tons.

VENICE

"Cantieri Navali Ernesto Breda"

The number of Building Slips is uncertain. No ships have been built for the Navy for some time except Tugs and other Small Craft. 800 men are employed.

"Cantieri Navali ed Officine Meccaniche"

Has built Small Craft for the Navy, but recently nothing except small Cargo Boats. About 600 men are employed.

VENTIMIGLIA (VARAZZE)

"Cantieri Baglietto"

Builds M.A.S. and is reported to be capable of constructing six hulls simultaneously.

Shipbuilding Yards Building Warships

Place.	Name of Yard	Class of Ship Built	Remarks
GENOA	Ansaldo Societa Anonima.	Capital ships, cruisers, scouts, destroyers, coastal, submarines, M.T.Bs.	Built "Littorio," 35,000 tons. Two "esploratori" under construction.
SPEZIA (Muggiano)	Odiero - Terni - Orlando Soc. per la Costruzione di Navi.	Capital ships, cruisers, scouts, destroyers, submarines, supply ships, M.T.Bs.	The most important combine in Italy. No capital ships built in recent years. One "esploratore."

San Rocco

Five Building Ships.—Two 550 ft., one 450 ft., one 400 ft., and one 350 ft. long. War Vessels, including Cruisers up to 10,000 tons, have been built and also Merchant Vessels. Recently no building has been carried out and the Yard has been used solely for refitting ships of the Lloyd Triestino and associated lines. It is possible that the Yard will shortly recommence building Merchant Ships.

Other Establishments

The "Arsenale del Lloyd Triestino," which has its own Engine and Boiler Works, builds Merchant Vessels up to 7,000 tons.

*VENICE**"Cantieri Navali Ernesto Breda"*

The number of Building Ships is uncertain. No ships have been built for the Navy for some time except Tugs and other Small Craft. 800 men are employed.

"Cantieri Navali ed Officine Meccaniche"

Has built Small Craft for the Navy, but recently nothing except small Cargo Boats. About 600 men are employed.

*VENTIMIGLIA (VARAZZE)**"Cantieri Baglietto"*

Builds M.A.S. and is reported to be capable of constructing six hulls simultaneously.

Shipbuilding Yards Building Warships

Place.	Name of Yard.	Class of Ship Built.	Remarks.
GENOA	Ansaldo Societa Anonima.	Capital ships, cruisers, scouts, destroyers, coastal, submarines, M.T.Bs.	Built "Littorio," 35,000 tons. Two "esploratore" under construction.
SPEZIA (Muggiano)	Odero - Terni - Orlando Soc. per la Costruzione di Navi.	Capital ships, cruisers, scouts, destroyers, submarines, supply ships, M.T.Bs.	The most important combine in Italy. No capital ships built in recent years. One "esploratore."
TRIESTE— San Marco	Cantieri Riuniti dell'Adriatico	Capital ships	"Vittorio Veneto" built. "Roma" under construction.
Monfalcone	—	Submarines, minelayers, M.T.Bs., liners, tankers, cargo boats.	Between 1934-36 built 25 submarines for Government. The best organised and most progressive shipyard in Italy. 1930 Built liner "Stockholm" (28,000 tons). Six submarines and 12-14 merchant ships believed under construction at present.

* And 3 submarines under construction; also 24 midget submarines and a number of M.A.S.

Note.—In addition to the above a number of other yards are engaged in the construction of torpedo boats, destroyers, submarines, minesweepers and M.T.Bs. (See list "Other Shipbuilding Yards.")

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Other Shipbuilding Yards

Place.	Name of Yard.	Class of Ship Built.	Remarks.
ANCONA ..	*Cantieri Navale Riuniti.	Scouts, destroyers, torpedo boats, minelayers.	Annual capacity 50,000 tons. Two "esploratore" and two submarines under construction.
CASTELLAMARE DI STABIA ..	*Consorzio Costruzione Navale.	See under Naples	One "esploratore" under construction in November, 1939.
CATANIA ..	Cantiere Biriacci ..	—	Reported capable of building up to 1,400 tons and repairs. No report since 1935.
CHIOGGIA ..	Cantiere Navale Poli ..	Merchant vessels up to 500 tons.	No report since 1935.
LIMITE SULL'ARNO FIUME ..	Picchiotti .. *Cantieri Navale del Quarnaro.	M.T.B.s .. Scouts, destroyers, submarines. Merchant vessels up to 2,000 tons.	No report since 1938. Unconfirmed report that two submarines were under construction in February, 1940.
GENOVA— Foce ..	Odero - Terni - Orlando Soc. per la Costruzione di Navi, Macchine ed Artiglierie. *Do. do.	Destroyers, torpedo boats. Merchant vessels up to 6,000 tons.	1935 information. No report on yard since 1937.
Sestri Ponenti ..	*Do. do.	Cruisers up to 7,000 tons. Merchant vessels up to 8,000 tons.	—
Riva Trigosa ..	*Cantieri Nav. del Tirreno.	Scouts and destroyers. Merchant vessels up to 12,000 tons.	"Dulio" modernised here. Two "esploratore" under construction in November, 1939.
Pietra Ligure ..	Cantieri Federal per Costruzioni Navale.	Merchant vessels up to 6,000 tons.	Estimated annual capacity, 40,000 tons. No report since 1935.
Voltri ..	Soc. Anonima Cantieri Cerusa.	Merchant vessels up to 6,000 tons.	No report since 1935.
Cornigliano ..	Cantieri Officine Savoia	—	Formerly built vessels of 6,000 tons (?) Now closed down; no report since 1937.
LEGHORN ..	*Odero Terni - Orlando Soc. per la Costruzione di Navi.	Cruisers up to 10,000 tons. scouts, destroyers.	"Tashkent" built here. Three destroyers and four "esploratore" under construction.
NAPLES (all part of Naval Meccanica).	Picchiotti .. Bacini e Scali Napoletani Officine Meccaniche e Cantieri Navali di Napoli Consorzio Cooperativo Costruzione Navale (Castellamare di Stabia). Alti Forni Acciaierie d'Italia (I.L.V.A.) (Bagnoli).	M.T.B.s .. Yards under reconstruction.	No information since 1936.
PALERMO ..	*Cantieri Navale Riuniti	Scouts, destroyers, torpedo boats, minelayers, merchant vessels up to 15,000 tons. tankers. M.T.B.s ..	No report since 1938 when yard was reported demolished and site occupied by torpedo factory. Fast motor torpedo boats were reported to be made in 1934.
POLA ..	Cantieri Navale Scoglio Olivi.	—	Annual capacity, 50,000 tons (1935). One "esploratore" under construction in November, 1939. Repair work for submarines and other small vessels. No

GENOA— Foce ..	Odero - Terni - Orlando Soc. per la Costruzione di Navi, Macchine ed Artiglierie. *Do. do.	Destroyers, torpedo boats. Merchant vessels up to 6,000 tons.	struction in February, 1940. 1935 information. No report on yard since 1937.
Sestri Ponenti ..	..	Cruisers up to 7,000 tons. Merchant vessels up to 8,000 tons.	—
Riva Trigosa ..	*Cantieri Nav. del Tirreno.	Scouts and destroyers Merchant vessels up to 12,000 tons.	"Dulio" modernised here. Two "esploratore" under construction in November, 1939.
Pietra Ligure ..	Cantieri Federal per Costruzioni Navale.	Merchant vessels up to 6,000 tons.	Estimated annual capacity, 40,000 tons. No report since 1935.
Voltri ..	Soc. Anonima Cantieri Cerusca.	Merchant vessels up to 6,000 tons.	No report since 1935.
Cornigliano ..	Cantieri Officine Savoia	—	Formerly built vessels of 6,000 tons. (?) Now closed down, no report since 1937.
LEGHORN ..	*Odero Terni - Orlando Soc. per la Costruzione di Navi.	Cruisers up to 10,000 tons, scouts, destroyers.	"Tashkent" built here. Three destroyers and four "esploratore" under con- struction.
NAPLES (all part of Naval Meccanica).	Picchiotti Bacini e Scali Napole- tani Officine Meccaniche e Cantieri Navali di Napoli Consorzio Cooperativo Costruz- ione Navale (Castella- mare di Stabia). Alti Forni Acciaierie d'Italia (I.L.V.A.) (Bagnoli).	M.T.B.s .. Yards under reconstruc- tion.	No information since 1936.
PALERMO ..	*Cantieri Navale Riuniti	Scouts, destroyers, tor- pedo boats, minelayers, merchant vessels up to 15,000 tons, tankers.	No report since 1936 when yard was reported demol- ished and site occupied by torpedo factory. Fast motor torpedo boats were reported to be made in 1934.
POLA ..	Cantieri Navale Scoglio Olivi.	M.T.B.s ..	Annual capacity, 50,000 tons (1935). One "esploratore" .. under construction in November, 1939.
TARANIO ..	*Cantieri Navale Franco Tosi.	Submarines. Merchant vessels up to 9,000 tons.	Repair work for submarines and other small vessels. No construction work since 1928. Believed to be as- sembly yard for midget sub- marines.
TRIESTE ..	Arsenale del Lloyd Triestino.	Merchant vessels up to 7,000 tons.	Three to four submarines under construction and (?) Diesel engines.
VENICE ..	*Cantieri Navali e Officine Meccaniche di Venezia.	Merchant vessels up to 400 tons.	No information since 1935.
VARAZZI (Savona) ..	*Cantieri Navale Ernesto Breda (Mestre). Cantieri Baglietto ..	Merchant vessels up to 700 tons. M.T.B.s, midget submar- ines.	Building small craft. Has built a scout, a cruiser and a monitor. No report since 1937.

Note.—Twelve yards marked * are at present engaged in the construction of small war vessels. (See Remarks column.)

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(3) Fuel Storage

Refineries

TABLE 1

ITALIAN REFINERIES

OIL SUPPLY POSITION, WITH SPECIAL REFERENCE TO AIR TARGET PRIORITY

CRUDE OIL REFINERIES—SERVING ITALIAN AND ALBANIAN FIELDS—1st July, 1942

Metric Tons					Remarks.
Priority.	Company.	Location.	Throughout Capacity, Tc/Yr.	Tankage.	
ITALY 1	A.N.I.C.	Bari	185,000	150,000	Inactive: no extensions and no damage 4/41 Active: no extensions and no damage 11/41. These installations are believed to have similar equipment, which includes distillation and hydrogenation plants linked up with cracking facilities. These plants would be capable of producing aviation gasoline from the Albanian crude. The production of either installation could probably be extended to handle the total Albanian output in emergency.
	A.N.I.C.	Leghorn	185,000	150,000	
3	Vacuum Oil Co. (Soc. Raffineria di Napoli).	Naples	280,000	180,000	There is a Houdry catalytic cracking plant with a feed capacity of about 150,000 tons per annum which, given sufficient quantities of suitable feed stock, would render possible the manufacture of 40,000 tons per annum of aviation gasoline. There is Duosol high-grade lubricating oil equipment and facilities.

Priority	Company	Location	Throughput Capacity, Tc/Yr.	Tankage	Remarks
ITALY 1	A.N.I.C.	Bari	185,000	150,000	Inactive: no extensions and no damage 4/41 Active: no extensions and no damage 11/41 These installations are believed to have similar equipment, which includes distillation and hydrogenation plants linked up with cracking facilities. These plants would be capable of producing aviation gasoline from the Albanian crude. The production of either installation could probably be extended to handle the total Albanian output in emergency.
	A.N.I.C.	Leghorn	185,000	150,000	
3	Vacuum Oil Co. (Soc. Raffineria di Napoli)	Naples	200,000	180,000	There is a Houdry catalytic cracking plant with a feed capacity of about 150,000 tons per annum which, given sufficient quantities of suitable feed stock, would render possible the manufacture of 40,000 tons per annum of aviation gasoline. There is Duosol high-grade lubricating oil equipment and facilities for de-waxing and the production of refined wax. Slightly damaged inactive 10/41.
4	A.G.I.P.	Venice	450,000	250,000	This is a modern refinery installation with cracking equipment. There are no facilities for lubricating oil. No significant photographic cover.

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TABLE 1—continued.

Priority.	Company.	Location.	Throughout Capacity, (e/Yr.	Tankage.	Remarks.
5	Aquila ..	Trieste ..	350,000	200,000	This is a modern refinery without cracking equipment. Lubricating oil facilities include an SO ₂ benzole solvent extraction unit from which high-grade lubricating oils and wax are available. No cover.
6	I.N.P.E.T. ..	Spezia ..	310,000	104,000	There is Dubbs cracking equipment, but no lubricating oil facilities. Intact seemed inactive 4/41.
7	Romisa ..	Fiume ..	120,000	50,000	There is an old Holmes-Manley cracking unit and a modern solvent (Edeleanu) high-grade lubricating oil plant. Small wax production facilities are available. No cover.
8	S.I.A.P. ..	Trieste ..	120,000	50,000	There is no cracking plant, but some facilities for making low-grade lubricating oils by acid treatment. No cover.
9	Permolio ..	Milan .. Rome .. Genoa ..	140,000	60,000	Active 6/40 } There is no cracking or solvent equipment, but low-grade lubricating oils are produced by acid treatment. No cover. No cover.
10	S.P.I. ..	Fornovo-Taro.	Very small	Very small	There is only topping equipment for running on locally produced crude oil. Aviation gasoline of 73 octane number can be produced by straight distillation. No cover.
Totals			2,120,000	1,194,000	

The aggregate capacity of these refineries is not a true indication of the amount of crude oil which could be run.

Special Note.—The Montecatini Company ran a tetra ethyl lead plant at Bussi which had a production capacity of about 500 tons per annum. There is a large chlorine plant in the same area and a number of electric chemical plants.

6	I.N.P.E.I.	Spezia	310,000	104,000	There is Dubois cracking equipment, but no lubricating oil facilities. Intact seemed inactive-4/41.
7	Romisa	Fiume	120,000	50,000	There is an old Holmes-Manley cracking unit and a modern solvent (Edeleanu) high-grade lubricating oil plant. Small wax production facilities are available. No cover.
8	S.I.A.P.	Trieste	120,000	50,000	There is no cracking plant, but some facilities for making low-grade lubricating oils by acid treatment. No cover.
9	Pernolio	Milan Rome Genoa	140,000	60,000	Active 6/40 } There is no cracking or solvent equipment, but low-grade lubricating oils are produced by acid treatment. No cover.
10	S.P.I.	Fornovo-Taro	Very small	Very small	There is only topping equipment for running on locally produced crude oil. Aviation gasoline of 73 octane number can be produced by straight distillation. No cover.
Totals			2,120,000	1,194,000	

The aggregate capacity of these refineries is not a true indication of the amount of crude oil which could be run.

Special Note.—The Montecatini Company ran a tetra ethyl lead plant at Bussi which had a production capacity of about 500 tons per annum. There is a large chlorine plant in the same area and a number of electric chemical plants.

THE HOUDEY PROCESS

This is a catalytic cracking process in which the catalysts act on the heavier hydrocarbons in vapour form. Pressure is only required to the extent necessary to pass the material through the plant in its various stages. The catalyst is a porous material made up into small pellets, and the solid polymerized products formed during the operation deposit on the catalyst and are removed by combustion.

The Naples plant is the most complete of any of this type, and is particularly directed towards the production of Aviation Gasoline and good quality Diesel Oil. The latter is generally retained as such since the production of Gasoline on reprocessing is considerably reduced. A typical yield from a distillate is:—

	Per Cent.
Gas ..	4
Total Gasoline Distillate ..	43
Gas Oil ..	45
Coke and Loss ..	8

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The Gas has a hydrogen methane ratio of 2:1 showing the marked difference between this form of cracking and ordinary thermal cracking. The Gasoline contains more Iso-paraffins and less Olefines and Di-olefines, the acid temperature rise being only from 20-50° C. It has a minimum octane value of 77 regardless of the type of charging stock, and the octane rating is evenly distributed over the entire boiling range making it very important for the production of safety motor spirit. The Gasoline has a high lead response, and it is claimed can be brought up to 100 octane direct. This seems doubtful, but the proportion of synthetic material required in addition would be small.

The estimated output of the Italian Refineries for the year 1942 is given in the following Table:—

TABLE 2
ITALIAN REFINERIES : ESTIMATE OF PRODUCTION, 1942
Metric Tons

Source	Raw Materials	Aviation Petrol	Motor Petrol	Kerosine	Gas/Diesel	Aviation and Motor Lubes	Other Lubes	Fuel Oils, Wax, Asphalt Pitch	Total Finished Products	Loss and Fuel Refinery
Italian Fields	10,500	1,500	5,500	2,000	1,000	—	—	—	10,000	500
Albanian Fields	250,000	80,000	35,000	—	—	50,000	—	45,000	210,000	40,000
Totals	260,500	81,500	40,500	2,000	1,000	50,000	—	45,000	220,000	40,500

Storage Capacity for Petroleum Products

Note.—This Table includes Tanks reported under construction.

TABLE 3

Refineries	Total Refinery Storage (see Table 1)	Capacity in M. tons	Remarks
1. Refineries		1,194,000	
2. Storage Installations — (a) Naval			
ANCONA	..	1,000	Includes 120,000 under construction and projected: four tanks near cemetery.
AUGUSTA—Island	..	28,000	
P. Cugno	..	360,000	
BRINDISI	..	27,000	Four tanks under construction, of capacity 3,000 tons each.
CATANIA	..	60,000	
CASTELLAMARE DI STABIA	..	?	Underground.
GAETA	..	50,000	
MESSINA	..	32,000	
NAPLES (Pozzuoli)	..	50,000	
NAPLES	..	100,000	

Source	Raw Materials	Aviation Petrol	Motor Petrol	Kerosene	Gas/Diesel	Aviation and Motor Lubes	Other Lubes	Fuel Oils, Wax, Asphalt	Total Finished Products	Losses and Refinery Fuel
Italian Fields	10,500	1,500	5,500	2,000	1,000	—	—	—	10,000	500
Albanian Fields	250,000	80,000	35,000	—	—	50,000	—	45,000	210,000	40,000
Totals	260,500	81,500	40,500	2,000	1,000	50,000	—	45,000	220,000	40,500

Storage Capacity for Petroleum Products

Note.—This Table includes Tanks reported under construction.

TABLE 3

	Capacity in M. tons.	Remarks.
1. Refineries —		
Total Refinery Storage (see Table 1)	1,194,000	
2. Storage Installations —		
(a) Naval —		
ANCONA	1,000	
AUGUSTA—Island	28,000	
P. Cugno	360,000	Includes 120,000 under construction and projected : four tanks near cemetery.
BRINDISI	27,000	
CATANIA	60,000	Four tanks under construction, of capacity 3,000 tons each.
CASTELLAMARE DI STABIA	?	
GAETA	50,000	
MESSINA	32,000	
NAPLES (Pozzuoli)	50,000	
NAPLES	100,000	Underground.
POLA	52,000	
PALERMO (Monte Pellegrino)	120,000	Includes 60,000 under construction.
SPEZIA	69,000	
SYRACUSE	60,000	Intensive work on underground tanks.
TARANTO	300,000	
TRAPANI	60,000	
VENICE	?	
CAGLIARI (Sardinia)	60,000	
SASSARI (Sardinia)	60,000	
MADDELENA (Sardinia)	60,000	
Total Naval Storage	1,549,000	

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TABLE 3—continued

	Capacity in M. tons.	Remarks.
(b) Commercial—		
VADO LIGURE (Nafta)	37,000	Large government reservoir in mountains overlooking Vado.
(Siap) ..	38,000	
(Agip) ..	34,000	
(Petrolea)	41,000	
(Vacuum)	11,000	
SAVONA (Siap) ..	120,000	
GENOA (C.G.O.M.)	34,000	
(Vil) ..	22,000	
(Sio) ..	18,000	
LIVORNO (Nafta)	7,000	
(Siap)	41,000	
CIVITAVECCHIA	4,000	
FIUMICINO (Guetta)	1,000	
NAPLES ..	164,000	
MONOPOLI (Siap)	45,000	
BARLETTA (Agip)	1,000	
MARINA DI RAVENNA (Pio)	5,000	
TRIESTE ..	200,000	
FIUME ..	100,000	
VENICE (Nafta)	48,000	
(Siap) ..	35,000	
(Agip) ..	140,000	
(Sio) ..	6,000	
(Inea) ..	9,000	
(Taglibue)	23,000	
(Apir) ..	17,000	
(Damini)	1,000	
PALERMO (Nafta)	6,000	
MESSINA (Siap)	32,000	
CATANIA (Siap) ..	2,000	
AUGUSTA (Shell)	12,000	
ANCONA (Falconara Maritima, S.I.A.P.)	8,000	
A.G.I.P.		
KOUTCHOVA and VALONA (Albania)	208,000	
LICATA (Sicily) ..	?	
TRENTO ..	500	
TURIN ..	3,000	
MILAN ..	4,500	
BERGAMO	1,000	
BOLOGNA	2,000	
BUSIO ARSIZIO	1,500	
S. GIORGIO NOGARO	3,500	
		Distributing centres.

SAVONA (Siap)	34,000	
GENOA (C.G.O.M.)	22,000	
(Vil)	18,000	
(Sio)	7,000	
LIVORNO (Nafta)	41,000	
(Siap)	4,000	
CIVITAVECCHIA	1,000	
FIUMICINO (Guetta)	164,000	
NAPLES	45,000	
MONOPOLI (Siap)	1,000	
BARLETTA (Agip)	5,000	
MARINA DI RAVENNA (Pio)	200,000	
TRIESTE	100,000	
FIUME	48,000	
VENICE (Nafta)	35,000	
(Siap)	140,000	
(Agip)	6,000	
(Sio)	9,000	
(Inea)	23,000	
(Taglibue)	17,000	
(Apir)	1,000	
(Damini)	6,000	
PALERMO (Nafta)	32,000	
MESSINA (Siap)	2,000	
CATANIA (Siap)	12,000	
AUGUSTA (Shell)	8,000	
ANCONA (Falconara Maritima, S.I.A.P.)		
AGIP		
KOUTCHOVA and VALONA (Albania)	208,000	
LICATA (Sicily)	500	
TRENTO	3,000	
TURIN	4,500	
MILAN	1,000	
BERGAMO	2,000	
BOLOGNA	1,500	
BUSTO ARSIZIO	3,500	
S. GIORGIO NOGARO	1,000	
FLORENCE	6,000	
ROME	50,000	
DODECANESE—		
RHODES (say)	8,000	
LEROS	5,600	
LEROS (Port Laki)	10,000	
LEROS (Northern Bay)		
Total Commercial Storage	1,566,600	
Add Total Refinery Storage	1,191,000	
Add Total Naval Storage	1,549,000	
Total Storage Built or Building	4,309,600	

Distributing centres.

Eight tanks at San Giorgio.
Under construction.

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(4) Supplies and Storage of Ammunition and other Naval Material

SPEZIA on the west coast and TARANTO on the east coast are the Main Supply Bases of the Italian Fleet. Information, however, is required concerning the relative importance of the supplies, etc., existing at the various Subsidiary Bases, *vide* O.U. 6161. It is of particular importance that any signs of development over and above what might be considered as normal requirements, should be reported, together with any information available concerning the significance to be attached to such development.

Arsenals and Armament Factories

While ITALY'S Main Industrial and Armament Centres are in the vicinity of MILAN and TURIN, certain important Naval and Military Material such as Armour, Guns, Torpedoes, Mines and Explosives are produced on or near the Italian littoral.

The following tables give a general idea of the Sources of Production, at places on or near the coast, which may be considered vulnerable to attack.

Declassified E.O. 12356 Section 3.3/NND No. 785015

STATE-OWNED MUNITION FACTORIES

Name.	Location.	Equipped for Manufacture of	Labour.	Output.
ARSENAL SAN VITO	SPEZIA	Guns up to 8 in. .. Gun carriages. Empty shell.	—	—
ROYAL ARSENAL	PIACENZA	Gun carriages .. Motor tractors, etc. .. Tanks. Empty shell. A.A. guns. Aero bombs. Hand grenades.	Peace average : 400.	—
GOVERNMENT ARSENAL	VENICE	Guns up to 3 in. .. Carriages. Empty shell.	—	—
ROYAL ARMS FACTORY	TERNI (north of ROME) ..	Guns of all calibres .. Carriages. Tanks. Rifles and machine guns. Fuzes. Empty shell.	Peace average : 1,000.	—
ROYAL ARSENAL	NAPLES	Guns of all calibres .. Carriages and mountings. Empty shell.	Peace average : 400.	—
PYROTECHNICAL LABORATORY	BOLOGNA	S.A.A., complete .. Propellant. Fuzes.	Peace average : 1,200.	—
PYROTECHNICAL LABORATORY	CAPUA, 74 miles from NAPLES.	S.A.A., complete .. Fuzes. Propellant.	Peace average : 800.	—
STATE ARMS FACTORY	SEGNI SCALO, ROME ..	S.A.A. .. Gun ammunition, "Filling."	Capacity : 11,000.	—

Declassified E.O. 12356 Section 3.3/NND No. 785015

STATE-OWNED MUNITION FACTORIES

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Location.	Equipped for Manufacture of	Labour.	Output.	Remarks.
SPEZIA	Guns up to 8 in. .. Gun carriages. Empty shell.	—	—	—
PIACENZA	Gun carriages .. Motor tractors, etc. Tanks. Empty shell. A.A. guns. Aero bombs. Hand grenades.	Peace average : 400.	—	—
VENICE	Guns up to 3 in. .. Carriages. Empty shell.	—	—	—
TERNI (north of ROME) ..	Guns of all calibres .. Carriages. Tanks. Rifles and machine guns. Fuzes. Empty shell.	Peace average : 1,000.	—	Enlarged to become one of the principal Government Arsenals. Rebuilt and re-equipped in 1930. Further enlarged in 1935.
NAPLES	Guns of all calibres .. Carriages and mountings. Empty shell.	Peace average : 400.	—	—
BOLOGNA	S.A.A., complete .. Propellant. Fuzes.	Peace average : 1,200.	—	—
CAPUA, 74 miles from NAPLES.	S.A.A., complete .. Fuzes. Propellant.	Peace average : 800.	—	New section opened 1936 equipped with 100 machines for producing 6-in. shell.
SEGGI SCALO, ROME ..	S.A.A. .. Gun ammunition. " Filling."	Capacity : 11,000.	—	At present leased to " BREDA."

Declassified E.O. 12356 Section 3.3/NND No. 785015

STATE POWDER FACTORY	..	FONTANA LIRI	..	..	Propellant .. High explosives, Military explosives. "Filling."	Peace average : 370.	Propellant—c. 120 tons per month. H.E.—c. 300 tons per month.
STATE POWDER FACTORY (ex G. STACCHINI).		SAN LEO (PESARO E URBINE), TIVOLI (ROME).			Propellant .. High explosives.	Peace average : 250.	—
FILLING FACTORIES	..	GENOA, BOLOGNA, PIACENZA, CAPUA.			Filling gun ammunition in war.	—	Capacity of all four to- gether: c. 100,000 rounds per day.
CENTRO CHIMICO MILITARE, ROME.		Laboratories, 30 miles from ROME. Research Station at PAVIA.			Experimental explosive establishment. Gas school.	—	—
SILURIFICIO ITALIANO	..	NAPLES	..	..	Mines .. Torpedoes.	1,000	

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FONTANA LIRI	Propellant High explosives. Military explosives. "Filling."	Peace average : 370.	Propellant—c. 120 tons per month. H.E.—c. 300 tons per month.	The H.E. and "filling" factories at PIACENZA have been trans- ferred to join the Propellant Factory at FONTANA LIRI.
PIACENZA (PESARO E URBINE), TIVOLI (ROME).	Propellant High explosives.	Peace average : 250.	—	This Company is understood to have been taken over by the State about 1926 as a State Powder Works.
PIACENZA, BOLOGNA, PIACENZA, CAPUA.	Filling gun ammunition in war.	—	Capacity of all four to- gether: c. 100,000 rounds per day.	—
Laboratories, 30 miles from ROME. Research Station at AVIA.	Experimental explosive establishment. Gas school.	—	—	Fully equipped laboratory for train- ing chemical officers. During East African Campaign gas bombs were made and filled here with TROTYL. Laboratories attached to Universities, etc., work under this centre.
PIACENZA	Mines Torpedoes.	1,000		Large Torpedo Factory; leased to Ansaldo.

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PRIVATELY OWNED MUNITION FACTORIES

Location.	Labour.	Normal Products.	Remarks bearing on Capacity, etc.
ISTOIA	—	S.A.A. Cartridge cases. Precision instruments, gauges and figs.	Estimated output capacity of TIZZORO and BARRICA together on a 24-hour working basis per day — 3,000,000 S.A.A. 40,000 gun cartridge cases. 300 tons forged products. 150 tons rolled products.
ESSANDRIA (PIEDMONT)	—	Empty shell S.A.A. Gun cartridge cases. Gauges, figs, tools and forgings. Aeroplane propellers.	Opened in 1933. Equipped with GERMAN machinery designed for capacity of 500,000 empty shell per month.
KNIGLIANO FIGURE and MPIERDARENA (GENOVA).	25,000 men per 24- hour working day.	Guns of all calibres up to 15-in. Shell. Carriages and mountings. Tanks. A.F.V.s. Torpedo tubes. Propellers. Empty shells .. Light tanks, A.F.V.s and tractors. Locomotives. Rolling Stock. Marine engines.	Equipped to manufacture field guns and shell in war. Started on anti-tank guns in 1936. Also reported to be making 105 mm. shells for SPAIN. SAN GIOVANNI reported monthly production 1936: — 25 light tanks. 25 medium tanks. 14 30-ton tanks. 12 A.F.V.s (tractors). 1,800 light M.G.s. 800 aviation M.G.s. 200 anti-aircraft M. 200,000 shells. 100,000 bombs. Reported to have started "filling" factory October, 1935.
TO SAN GIOVANNI (LAN).	Sections of all works: 30,000 per 24-hour day.	Small arms. Machine guns. Small calibre A.A. guns. Aero bombs. Hand grenades.	
TIRE (Near VENICE)			

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PRIVATELY OWNED MUNITION FACTORIES

Name.	Location.	Labour.	Normal Products.	
SOC. METALLURGICA ITALIANA..	PISTOIA	—	S.A.A. Cartridge cases. Precision instruments, gauges and jigs.	} Esti a in
Do.	LUCCA	—	S.A.A. Gun cartridge cases. Gauges, jigs, tools and forgings. Aeroplane propellers.	
Do.	ALESSANDRIA (PIEDMONT)	—	Empty shell	
SOC. AN. ANSALDO	CORNIGLIANO LIGURE and SAMPIERDARENA (GENOA).	25,000 men per 24- hour working day.	Guns of all calibres up to 15-in. .. Shell. Carriages and mountings. Tanks. All heavy metal war material ; armour plate A.F.V.s. Torpedo tubes. Propellers.	Outp bor KE
ERNESTO BRED A PER COSTRU- ZIONE MECCANICHE (STATE SUBSIDISED 1936).	SESTO SAN GIOVANNI (MILAN).	Sections of all works : 30,000 per 24-hour day.	Empty shells Light tanks, A.F.V.s and tractors. Locomotives. Rolling Stock. Marine engines.	Equi ple sh in 10 S.A.A. du
Do.	MESTRE (Near VENICE).		Small arms. Machine guns. Small calibre A.A. guns Aero bombs. Hand grenades.	10

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PRIVATELY OWNED MUNITION FACTORIES

60 SECTION V (4)

Location.	Labour.	Normal Products.	Remarks bearing on Capacity, etc.
STOIA	—	S.A.A. Cartridge cases. Precision instruments, gauges and jigs.	} Estimated output capacity of TIZZORO and BARGA together on a 24-hour working basis per day :— 3,000,000 S.A.A. 40,000 gun cartridge cases. 300 tons forged products. 150 tons rolled products.
CCA	—	S.A.A. Gun cartridge cases. Gauges, jigs, tools and forgings. Aeroplane propellers.	
LESSANDRIA (PIEDMONT)	—	Empty shell	Opened in 1933. Equipped with GERMAN machinery designed for capacity of 500,000 empty shell per month.
RNIGLIANO LIGURE and MPIERDARENA (GENOA).	25,000 men per 24-hour working day.	Guns of all calibres up to 15 in. .. Shell. Carriages and mountings. Tanks. All heavy metal war material ; armour plate A.F.V.s. Torpedo tubes. Propellers.	Output capacity : 500 guns p.m. Collaborate with Krupp through Soc. Italiana Krupp. Produced 1,040 A.F.V.s in 1935.
STO SAN GIOVANNI (ILAN).	Sections of all works : 30,000 per 24-hour day.	Empty shells Light tanks, A.F.V.s and tractors. Locomotives. Rolling Stock. Marine engines.	Equipped to manufacture field guns and planned to turn over to these and empty shell in war. Started on anti-tank guns in 1936. Also reported to be making 105 mm. shells for SPAIN. SAN GIOVANNI reported monthly production 1936 :— 25 light tanks. 25 medium tanks. 14 30-ton tanks. 12 A.F.V.s (tractors). 1,600 light M.G.s. 800 aviation M.G.s. 200 anti-aircraft M 200,000 shells. 100,000 bombs. Reported to have started " filling " factory October, 1935.
ESTRE (Near VENICE).		Small arms. Machine guns. Small calibre A.A. guns Aero bombs. Hand grenades.	

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TERNI-ODERO SOC. PER L'INDUSTRIA E L'ELETTRICITA.	TERNI	—	Gun turrets. Armour plating. Guns of all calibres. Machine guns. Empty shell. Propeller shafts and steering gear for ships.	Machinery cry Repe Repe facto
Do.	MUGGIANO (SPEZIA) ..	—	Naval guns of all calibres up to 15-in. Propeller screws. Armour plate. Transmissions. Naval machinery. Hand grenades. Rifles.	
STABILIMENTO ELETTRICO E MECCANICO, CARMINE DI LUCA	NAPLES	—	Torpedo tubes. Air compressors, etc.	
SILURIFICIO ITALIANO (ex ARM-STRONG-POZZUOLI).	POZZUOLI (West of NAPLES)	—	Guns of all calibres up to 15-in. Mountings. Projectiles. Fuzes. Torpedo tubes, and all kinds of ordnance fittings.	The m in IT
SILURIFICIO WHITEHEAD DI FIUME.	FIUME	1,500	Torpedoes of all types Aero bombs. Mines.	Now S pedoe
SAN BARTOLOMEO, NAVAL TORPEDO FACTORY.	SPEZIA	—	Torpedoes	Output
OFFICINE GALILEO	RIFREDI (Near FLORENCE)	2,000	Rangefinders. Gun sights. Sound locators. Periscopes. Gyro-compasses. Naval searchlights.	
CANTANEO FACTORY	BUSALLA (16 miles N. of GENOA).	500 per shift	Electrical and telephone apparatus Signals equipment. Empty shell.	Deliver PLAC
SOCIETA ROMANA COSTRUZIONI MECCANICHE.	ROME	—	Hand grenades.	

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ERNI	—	Gun turrets. Armour plating. Guns of all calibres. Machine guns. Empty shell. Propeller shafts and steering gear for ships.	Machine gun section, equipped with machinery from Fiat Works, opened in 1933. Reported capacity 1,000 per week. Reported to have started a "filling" factory October, 1935.
LUGGIANO (SPEZIA) ..	—	Naval guns of all calibres up to 15-in. Propeller screws. Armour plate. Transmissions. Naval machinery. Hand grenades. Rifles.	
NAPLES	—	Torpedo tubes. Air compressors, etc.	
MOZZUOLI (West of NAPLES)	—	Guns of all calibres up to 15-in. Mountings. Projectiles. Fuzes. Torpedo tubes, and all kinds of ordnance fittings.	The most important large calibre gun-works in ITALY.
PIUME	1,500	Torpedoes of all types Aero bombs. Mines.	Now State controlled. Produces 300 torpedoes a year.
SPEZIA	—	Torpedoes	Output: 80 torpedoes per annum.
RIFREDI (Near FLORENCE)	2,000	Rangefinders. Gun sights. Sound locators. Periscopes. Gyro-compasses. Naval searchlights.	
BUSALLA (16 miles N. of GENOA).	500 per shift	Electrical and telephone apparatus .. Signals equipment. Empty shell.	Delivers empty shell to State Arsenal at PLACENZA.
ROME	—	Hand grenades.	

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PRIVATELY OWNED MUNITION FACTORIES—continued

Name.	Location.	Labour.	Normal Products.
SOC. ORLANDO	FIUME	—	Land and naval guns.
ACCIAIERIE VENETE	VENICE	—	Gun components.
FONDERIE VENETE	VENICE	—	Mortars Bomb-throwers.
S.A. NAZIONALE COGNE	AOSTA	—	Ferro-manganese Ferro-silicon. Ingots. Bars. Fine steel for motor and aircraft industry. Air vessels for torpedoes.
SMALTERIE RIUNITE	ROME	—	Steel helmets
CATENIFICIO BASSOLI & Co.	LIVORNO	—	
SOC. ANON. INDUSTRIALE SAN GIORGIO.	GENOA-SESTRI PONENTE	—	General machinery Aluminium cast parts. Radiators. Gear cases. Rangefinders. Periscopes. Fire control gear and other precision instruments.

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PRIVATELY OWNED MUNITION FACTORIES—continued

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Location.	Labour.	Normal Products.	Remarks bearing on Capacity, etc.
ME	—	Land and naval guns.	
NICE	—	Gun components.	
NICE	—	Mortars Bomb-throwers.	Reported to be producing experimental types.
STA	—	Ferro-manganese Ferro-silicon. Ingots. Bars. Fine steel for motor and aircraft industry. Air vessels for torpedoes.	Reported to have installed GERMAN hydraulic presses for production of air chamber for torpedoes.
ME	—	Steel helmets	Produced 1,000,000 helmets in 1934-35.
VORNO	—		The only manufacturers of chain cable for ships of heavy tonnage, also mooring cables.
NOA-SESTRI PONENTE	—	General machinery Aluminium cast parts. Radiators. Gear cases. Rangefinders. Periscopes. Fire control gear and other precision instruments.	

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PRIVATELY OWNED EXPLOSIVE FACTORIES

Note.—There are a vast number of small manufacturers in ITALY not included in this list.

Name of Firm.	Factories at	Normal Products	Labour.	Output.	
SOC. ITAL. DI PRODOTTI ESPLO- DENTI E. CHIMICI (S.I.P.E.) (ACNA-MONTECATINI).	BOLOGNA CENGIO (GENOA) CAIRO MONTENOTTE (SAVONA) FORTE DEI MARMI (LUCCA) PONTICELLI (NAPLES) ..	Aniline dyes Military explosives. Toxic gases. NITROPENTA. Nitro-glycerine. Mining explosives. Nitro-cellulose, etc. "Filling" at certain factories. T.N.T.	—	—	Tha th se a A co Pl ex
DYNAMITE NOBEL	CARMIGNANO (FLORENCE) AVIGLIANO BUSSI	Gun-cotton Nitro-cellulose Bombs Gunpowder.	2,500	—	
ASSOC. CHIMICA NAZIONALE (ACNA-MONTECATINI).	MERCATO SARACENO (Near FORLI). (Other factories do not make explosives).	Military Explosives Toxic gases. Nitro-glycerine. Nitro-cellulose.	—	—	Spe M pl
SOC. ANON. BOMBRINI- PARODI-DELFINO	SEGNI-COLLEFERRO (S.E. of ROME).	Military H.E. Cordite dynamite Hand grenades. Bombs Fillings Trottyl. S.A.A. Nitro-cellulose powder. T.N.T.	12,000	—	Ma gr lar wi S.
SOC. GEN. DI EXPLOSIVI E MUNIZIONI.	AULLA (MASSA E CARRARA) N.E. of SPEZIA.	Black powder Nitro-cellulose. Military H.E. Dynamite, etc.	—	—	
SOC. AN. POLVERIFICI PIE- MONTESE (NEGRO, BONI- FACIO).	CUNEO	Black powder Propellants.	—	—	

PRIVATELY OWNED EXPLOSIVE FACTORIES

Note.—There are a vast number of small manufacturers in ITALY not included in this list.

Factories at	Normal Products.	Labour.	Output.	Remarks.
OGNA GIO (GENOA) O MONTENOTTE (SAVONA) TE DEI MARMI (LUCCA). VICELLI (NAPLES) ..	Aniline dyes Military explosives. Toxic gases. NITROPENTA. Nitro-glycerine. Mining explosives. Nitro-cellulose, etc. " Filling " at certain factories. T.N.T.	—	—	The principal explosive combine including the " NOBEL " works under whose name several of the factories are known. Has a connection with the BADISCHE ANILIN FABRIK & I.G.F.I. and is controlled by ACNA-MONTECANTIL. Plant for manufacture of toxic gases exists at VERCELLI and PARMA.
MIGNANO (FLORENCE) GLIANO BUSSI	Guncotton Nitro-cellulose Bombs. Gunpowder.	2,500	—	
ACATO SARACENO (Near ORLI). er factories do not make plosives).	Military Explosives Toxic gases. Nitro-glycerine. Nitro-cellulose.	—	—	Specially detached as a sub Co. of ACNA-MONTECATINI to concentrate on explosive manufacture.
NI-COLLEFERRO (S.E. of OME).	Military H.E. Cordite dynamite. Hand grenades. Bombs Fillings. Trottyl. S.A.A. Nitro-cellulose powder. T.N.T.	12,000	—	Mainly produces explosives for its own grenades and bombs, but capacity is larger than these requirements. Equipped with German machinery; output of S.A.A. reported at 220,000 rounds per day.
LLA (MASSA E CARRARA) E. of SPEZIA.	Black powder Nitro-cellulose. Military H.E. Dynamite, etc.	—	—	
EO	Black powder Propellants.	—	—	

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PRIVATELY OWNED EXPLOSIVE FACTORIES—continued

Name of Firm.	Factories at	Normal Products.	Labour.	Output.	
LA VERSIGLIA (L. BRESCIANI E CA).	PIETRASANTA (LUCCA)	Black powder Mixed powders Nitro-cellulose. High explosives	—	—	
SOC. ITAL. PER LA FABB. DELI. APPUIA SUBLIMATE AMI-GRINA RESCHIERI E PELLAGRI.	BOLOGNA		—	—	
S.A. EXPLOSIVIE MUNIZIONI which includes —					
(a) S.A.I. PAUL. VERI	SPILAMBERTO	Smokeless and blasting powder	—	—	
(b) SOC. AN. ITAL. CONSUMATORI EXPLOSIVI.	ORBETELLO (GROSSETO) TRIESTE.	Mining explosives Balistite. Dynamite.	—	—	Scene arb
(c) CALO PAULO E GIOVANNI	GALATONE (LECCE)	Mining explosives	—	—	
(d) Factories at:—	VILLAFRANCA in LUNIGIANA (between PARMA and SPEZIA) PALLEROLE.	Dynamite and powders	—	—	
SOC. ITAL. ESPL. "CHEDDITE"	GALLICANO (LUCCA) LIVORNO	Cheddite Black powder. Blasting powder.	—	—	
SOC. APUANA PROD-ESPLODENTI.	CARRARA	Mining explosives	—	1 ton Pentrit per day.	
SOC. SARDA DI MATERIE ESPLODENTI.	CAGLIARA (SARDINIA) FIVIZZANO (CARRARA).	Mining explosives	—	—	
SOC. PENTHRITE	SPILAMBERTO		—	—	In S

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PRIVATELY OWNED EXPLOSIVE FACTORIES—continued

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Factories at	Normal Products	Labour	Output	Remarks
TRASANTA (LUCCA)	Black powder	—	—	
LOGNA	Mixed powders Nitro-cellulose High explosives	—	—	
LAMBERTO	Smokeless and blasting powder	—	—	
BETELLO (GROSSETO) ESTE	Mining explosives Balistite Dynamite	—	—	Scene of explosion April, 1935. Also makes artillery and infantry powder.
LATONE (LECCE)	Mining explosives	—	—	
LAFRANCA in LUNIGIANA between PARMA and SPEZIA) ALLEROLE	Dynamite and powders	—	—	
LICANO (LUCCA) ORNO	Cheddite Black powder Blasting powder	—	—	
ARRARA	Mining explosives	—	1 ton Pentrit per day.	
LIARA (SARDINIA) IZZANO (CARRARA)	Mining explosives	—	—	
LAMBERTO		—	—	In S.I.P.E. group.

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CONCERNS PRODUCING AND EQUIPPED TO PRODUCE TOXIC SUBSTANCES AND CHEMICAL WARFARE MUNITION

(C46758)

Name.	Location.	Personnel.	Product.	Output.	Remarks bearing on Ca
ARMY GAS PLANT	BOLOGNA	—	Mustard gas	—	Capacity : 70 tons per
NAVAL GAS PLANT	TARANTO	—	Mustard gas	—	Capacity : 60 tons per
AIR FORCE GAS PLANT	PAVULLO, PORSIGNANO, FROSINONE.	—	Lewisite Mustard gas. Esturmitiprite	—	Capacity : 240 tons per
SULPHUR WORKS	CALTANISSETTA, SICILY	—	Bromoacetone	—	Also makes aniline and mine for photographic
INSTITUTE OF PHARMA- CEUTICAL CHEMISTRY OF STATE UNIVERSITY.	NAPLES	—	Chlorpirin	—	Capacity : 2 tons per d
SADAM	ACQUASANTA, near PALERMO	—	Chlorine	—	
	TRAPANI	—	Iodine	—	
POMPILIO	Near NAPLES	—	Chlorine	—	
STA. MARGARITA DI SAVOIA	STA. MARGARITA DI SAVOIA	—	Bromine and iodine from sea water and weed.	—	250 tons of bromine per
SOC. ANON. FONDERIE DEL PIGNONE.	FLORENCE	—	Lead-lined gas air-bombs; heavy 75 kg., medium 50 kg., light 25 kg. Gas hand grenades, aircraft gas bombs. Gas mask components. Flame throwers. Fire extinguishers. Gas cylinders and chemical containers. Mines Depth charges. P.V's.	—	FIAT is reported to be to produce gas masks at the rate of 500,000 day. Output of 50 mines per
STATE FACTORY	SCANZANO	—	Gas masks and protective clothing.	—	

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AND EQUIPPED TO PRODUCE TOXIC SUBSTANCES AND CHEMICAL WARFARE MUNITIONS AND EQUIPMENT

Location.	Personnel.	Product.	Output.	Remarks bearing on Capacity.	General Remarks.
A	—	Mustard gas	—	Capacity : 70 tons per month	
D	—	Mustard gas	—	Capacity : 60 tons per month	
D, PORSIGNANO, NONE.	—	Lewisite Mustard gas Esturmitiprite	—	Capacity : 240 tons per month	
ISSETTA, SICILY	—	Bromoacetone	—	Also makes aniline and bromine for photographic plates	At sulphur mines.
	—	Chlorpirin	—	Capacity : 2 tons per day ..	
ANTA, near PALERMO	—	Chlorine	—		Produced from seaweed.
I	—	Iodine	—		Subsidised by Government to produce large quantities in emergency.
PLES	—	Chlorine	—		
RGARITA DI SAVOIA	—	Bromine and iodine from sea water and weed.	—	250 tons of bromine per annum	Capacity calculated to meet G.S. requirements in war.
NCE	—	Lead-lined gas air-bombs; heavy 75 kg., medium 50 kg., light 25 kg. Gas hand grenades, aircraft gas bombs. Gas mask components. Flame throwers. Fire extinguishers. Gas cylinders and chemical containers. Mines Depth charges. P.V's.	—	FIAT is reported to be able to produce gas mask filters at the rate of 500,000 per day. Output of 50 mines per day.	
NO	—	Gas masks and protective clothing.	—		

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RESEARCH ESTABLISHMENTS AND GAS SCHOOLS

CHEMICAL CENTRES—

- (a) Centro Chimico-Militare, experimental laboratory, 30 miles from ROME.
 - (b) FLORENCE (at University).
 - (c) SCANZANO BELFIORE, 171 kms. from ROME on Orte-Terni-Ancona Railway.
-

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AND GAS SCHOOLS

al laboratory, 30 miles from

from ROME on Orte-Terzi-

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(5) Defended Areas.

Fortresses which are both Naval and Military strongholds are commanded by either a Naval or Military officer, according to the relative Naval or Military importance of the place. Thus, the Naval Fortresses of VENICE, SPEZIA, MADDALENA, BRINDISI, and TARANTO, are under the supreme command of the Admiral Commanding, while at GAETA and MESSINA, an army officer is in command. The personnel for coast defence are drawn from the Navy and the Army. Shore batteries are manned by naval ratings while the army coast artillery personnel man the high level Batteries. The naval coast defence forces are called the "Difesa Marittima" and are stationed at SPEZIA, MADDALENA, TARANTO, BRINDISI, VENICE, GAETA, and MESSINA. They are under the orders of the fortress commander and their duties include the following:—

- (a) Submarine Defence.
- (b) Torpedo Batteries.
- (c) Obstructions.
- (d) Minesweeping.
- (e) Manning of Shore Batteries.
- (f) Searchlights.
- (g) Examination Service: Pilotage.
- (h) Naval Communications.
- (i) Mobile Defences (Tugs, Armed Boats, etc.).
- (j) Coast Watching.
- (k) Guarding Naval Depots and Stores.
- (l) Protection of Naval Works against Aircraft.

The extent of coast defence is the radius of action of the fortress. Units of the "Difesa Marittima" may serve at ports other than those enumerated. The strength, composition and disposition of the "Difesa Marittima" is under the Ministry of Marine.

For Defences of Mainland Ports—see Section VI.

For Defences between Mainland Ports—see Section VI—Mainland—General.

Armoured Trains

Armoured trains, particulars as to armament, etc., of which are given in Section VI, MAINLAND, have been seen on the following Railways:—

GENOA to the French frontier.

GENOA to SPEZIA.

ADRIATIC Coast.

- (c) Obstructions.
- (d) Minesweeping.
- (e) Manning of Shore Batteries.
- (f) Searchlights.
- (g) Examination Service ; Pilotage.
- (h) Naval Communications.
- (i) Mobile Defences (Tugs, Armed Boats, etc.).
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GENOA to SPEZIA.

ADRIATIC Coast.

The following is a description, by an Italian war correspondent, of the procedure for bringing their armoured trains into action:—

Two locomotives are kept with steam up constantly ready to dash off at high speed at the first sign of land bombardment from the sea. One pulls, the other pushes the intermediate cars. At the signal, all civilian traffic is side-tracked. One train carried a car of munitions right behind the engine, several more of long range guns and their equipment, and one car on which were mounted anti-aircraft artillery and special machine-guns for warding off enemy planes. Unless there is an actual plane attack, however, anti-aircraft guns are not used, for fear of revealing the train's position. That is, the usual precautionary anti-aircraft barrage is not thrown up.

Having arrived at the designated spot, the two engines pulled away a short distance, leaving the gun carriages alone. Heavy braces were dropped to the ground to help absorb the firing shocks, thus sparing the tracks from being jolted out of alignment. While this was going

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on, sailors ran up a signalling mast and quickly strung a provisional telephone line to the permanent wires along the right of way, giving the various units of the train telephonic connection with each other. Within a minute and a half of the train's arrival on the spot, all this had been done and the guns were in firing position.

The number of these trains stationed at strategic points along the Italian coast is a military secret.

Defences of Railways

A branch of the Fascist Militia is known as the Railway Militia and is responsible for the security of the railway system. They travel in trains, and also picket goods yards, tracks, bridges, etc.

It may be assumed therefore that vulnerable points on railways are guarded. Frequent reports, of which the following is one, indicate the existence of this defence system:—

Along the railway ROME-NAPLES, and probably on all other railways throughout Italy, every bridge and culvert is guarded by a sentry with one or two more guards off duty nearby. (B.2 : 1942.)

Coast-Watching Organisation

Sailing vessels of about 330 tons, fitted with 2-cylinder Diesel engines of about 124 H.P., are used for coast-watching along the coasts of the Mainland and of SARDINIA.

These craft are armed with two machine-guns and carry five marines on board.
(1941 : B.2.)

Anti-Aircraft Defence

Organisation

Anti-Aircraft Defence in ITALY is divided into three grades as under:—

- (i) *First-grade* localities defended by A.A. guns and Aircraft or by A.A. guns only.
- (ii) *Second-grade* localities defended by machine-guns.
- (iii) *Third-grade* localities defended by passive defence, i.e., gas-masks, shelters, etc.

The service of A.A. Defence is entrusted to a Fascist Militia organisation called the D.I.C.A.T., of which the Headquarters are in ROME. The whole of ITALY, for purposes of A.A. Defence, is divided into three Territorial zones, to each of which is allotted a "Raggruppamento" of the D.I.C.A.T. The "Raggruppamento" is sub-divided into "Groups of Legions," "Legions," "Cohorts" and "Batteries." Each Battery comprises three officers, eight N.C.Os., 126 O.Rs., and, in most cases, four A.A. guns and a section of heavy M.Gs.

Fire Direction

Fire direction is given from a "Central Fire Direction Control" and the "Barrage" is generally used.

Observation and Listening Organisation

An organisation, also under the D.I.C.A.T., exists for Observation Posts which supply the A.A. Batteries with the necessary information and also communicate by means of ground

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- (i) *First-grade* localities defended by A.A. guns and Aircraft or by A.A. guns only.
- (ii) *Second-grade* localities defended by machine-guns.
- (iii) *Third-grade* localities defended by passive defence, i.e., gas-masks, shelters, etc.

The service of A.A. Defence is entrusted to a Fascist Militia organisation called the D.I.C.A.T., of which the Headquarters are in ROME. The whole of ITALY, for purposes of A.A. Defence, is divided into three Territorial zones, to each of which is allotted a "Raggruppamento" of the D.I.C.A.T. The "Raggruppamento" is sub-divided into "Groups of Legions," "Legions," "Cohorts" and "Batteries." Each Battery comprises three officers, eight N.C.Os., 126 O.Rs., and, in most cases, four A.A. guns and a section of heavy M.Gs.

Fire Direction

Fire direction is given from a "Central Fire Direction Control" and the "Barrage" is generally used.

Observation and Listening Organisation

An organisation, also under the D.I.C.A.T., exists for Observation Posts which supply the A.A. Batteries with the necessary information and also communicate by means of ground strips with defensive aircraft. This organisation consists of a large number of Observation Posts connected by telephone with an "Information Collection Centre." Theoretically, each Observation Post should be equipped with a listening apparatus, but in point of fact owing to a shortage only a few of the Posts have this apparatus.

Searchlights

For observation at night the D.I.C.A.T. is issued with field projectors of 100 cm. type "SALMOIRAGHI." But here too there is a shortage and at the moment No. 1 "Raggruppamento," which is responsible for the whole of the North of ITALY, has only 125 searchlights.

Personnel

The D.I.C.A.T. "legions" are normally composed of Militiamen, old "Fascisti," who belong to the Territorial Reserve classes, but recently several Batteries have been sent to EAST AFRICA and to replace them the D.I.C.A.T. has been authorised to engage "Young Fascists" recently called to the Colours.

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Location of A.A. Batteries

Batteries are known to exist at all Ports of any consequence. Details are given in Section VI.

Weapons

The A.A. guns mainly used are of 3-in. calibre, fixed or semi-mobile. These guns have a maximum range of about 24,000 ft. and their rapidity of fire is not great.

Dispositions of Machine-gun Sections

Machine-gun Sections are known to exist also at the majority of Ports and are organised into sub-sections, which are distributed at various important points in the Town and its Suburbs, such as Railway Stations, Municipal Offices, Munition Factories, Aerodromes and Docks.

Barrage Balloons

Balloons have been seen flying at AUGUSTA, BRINDISI, GENOA, LEGHORN, LICATA, MESSINA, NAPLES, PALERMO, SYRACUSE and TARANTO.

BRIEF SUMMARY OF PORTS AND THEIR DEFENCES*

* Note.—A comparison between the defences of the captured African ports, as they were believed to have been before capture, and as found suggests that the number and/or calibre of coast defence guns had been over-estimated and that the A.A. defences were not

Place.	Description.	Defences.			Air Stations in Vicinity.
		Coast.	Anti-Aircraft.	Booms, etc.	
MAINLAND.					
ANCONA	A well-sheltered artificial harbour with accommodation for a cruiser squadron alongside. A declining commercial port with a "D" anchorage.	6—3-in., possibly more.	Some reported.	Not known.	(a) Service seaplane base. (b) Aerodrome at FANARA.
BARI	Naval base under construction: could be used by cruisers: purpose—a base from which to take offensive action.	5 batteries. 16—4-in. 2—6-in.	4 batteries, 12—3-in., probably more. 24—3-in. landed in 1940, positions not known.	Boom. Defensively mined.	Aerodrome.
BARLETTA ..	—	—	—	Boom? Defensively mined.	—
BRINDISI	"C" anchorage, partly enclosed by breakwaters, which form a well sheltered harbour except from the north. There is a naval and commercial port, both under naval control, the former being a secondary fleet base for destroyers and S./M.s.	12 batteries. 6—8—15-in. 12—15—12-in. 9—12—6-in. 1—4-in.	13 batteries. Aircraft sound detector. A.A. searchlights. Balloon barrage north of town.	Boom. Defensively mined.	(a) Service aerodrome. (b) Service seaplane base.
CASTELLAMARE di STABIA.	Of importance mainly owing to its naval dockyard. An "A" anchorage with a small enclosed harbour.	4—3-in. (Included in General Defence Scheme for Naples.)	4—3-in.	Boom.	(a) Service aerodrome. CAPODICHINO (b) Service seaplane base.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES*

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defences of the captured African ports, as they were believed to have been before capture, and as found after occupation by British Forces, number and/or calibre of coast defence guns had been over-estimated and that the A.A. defences were mostly mobile.

Description.	Defences.			Air Stations in Vicinity.	Possible Objectives and Targets.
	Coast.	Anti-Aircraft.	Booms, etc.		
Artificial harbour with for a cruiser squadron lining commercial port storage.	6—3-in., possibly more.	Some reported.	Not known.	(a) Service seaplane station. (b) Aerodrome at FALCON- ARA.	Railway. W/T stations. Naval oil fuel tanks. Shipbuilding yard. Electric power station.
Construction: could be purpose—a base from active action.	5 batteries. 16—4-in. 2—6-in.	4 batteries, 12—3-in., probably more. 24—3-in. landed in 1940, posi- tions not known.	Boom. Defensively mined.	Aerodrome.	A.N.I. Co. oil refinery. Industrial area and marshalling yard. Electric light, power and gas- works. Broadcasting station. Oiling mole.
—	—	—	Boom ? Defensively mined.	—	A.G.I.P. oil tanks.
Partly enclosed by break- form a well sheltered om the north. d commercial port, both rol, the former being a base for destroyers and	12 batteries. 6—8—15-in. 12—15—12-in. 9—12—6-in. 1—4-in.	13 batteries. Aircraft sound detector. A.A. searchlights. Balloon barrage north of town.	Boom. Defensively mined.	(a) Service aerodrome. (b) Service seaplane station.	Naval oil fuel tanks. Naval base and establishments. Seaplane station (Air Force). Seaplane station (Commercial). Government coal store. Merchant shipping wharf. S.A.C.A. aero-engine factory. Patent fuel factory.
Only owing to its naval "A" anchorage with a rbour.	4—3-in. (Included in General Defence Scheme for Naples.)	4—3-in.	Boom.	(a) Service aerodrome at CAPODICHINO. (b) Service seaplane station.	Naval dockyard and shipbuilding yard, including Government rope factory and oil stores. A.V.I.S. aircraft factory. Commercial port. Seaplane station.

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(C46758)	FIUME	Can handle a large amount of commercial traffic. Shipbuilding yard and torpedo factory.	2-5-9-in.	2 or more batteries. Sound detectors.	? Boom.	(a) Flying boats from harbour
	GAETA	"B" anchorage which affords excellent shelter for battleships and small craft during southerly through west to northerly winds.	9 batteries. 5-10-in. 8-9-4-in. Probably 40 more, 2-2-in. to 6-in.	Not known.	Boom.	(a) Civil aerodrome TERRACINA (b) Civil aerodrome SESSA ARU
	GENOA	Large commercial port: largest vessels can enter.	17 batteries. 2-6-in. At least 6-3-in. H.A./L.A.	22 batteries	Boom minefield projected.	(a) Civil seaplane station (b) Air port; land planes.
	LIVORNO	Commercial Port.	5-6-in. 4-5-in.	14 light batteries of which 10 are for defence of the Refinery and one for the seaplane station at Marina di Pisa.	Boom.	(a) Service seaplane station (b) Seaplane station ORBETTELLO (c) Aerodrome at Pisa (d) Landing ground
	LUSSIN PICCOLO..	One of the best natural harbours in the Northern Adriatic: "E" anchorage.	10 batteries. 22-6-in.	3-possibly more, 3-in. or 4-in. guns.	? Boom.	(a) Harbour is suitable for seaplanes.

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Large amount of commercial land and torpedo factory.	2-5.9-in.	2 or more bat- teries. Sound detectors.	? Boom.	(a) Flying boats take off from harbour.	Shipbuilding yard. Torpedo factory. A.G.I.P. petroleum refinery. Power station. Waterworks.
which affords excellent anchorage for battleships and small craft from west to northerly	9 batteries. 5-10-in. 8-9.4-in. Probably 40 more, 2-2-in. to 6-in.	Not known.	Boom.	(a) Civil aerodrome at TERRACINA. (b) Civil aerodrome at SESSA ARUNCA.	Fuel storage tanks. Magazine. Railway. H/T overhead line for lighting. Small repair base.
port : largest vessels can	17 batteries. 2-6-in. At least 6-3-in. H.A./L.A.	22 batteries	Boom minefield projected.	(a) Civil seaplane station. (b) Air port ; land and sea planes.	Ordnance and electrical works. Electric power station. Docks ; dry docks. Seaplane station. Oil fuel reservoirs. Grain silos. Shipbuilding and repair yards ; fitting-out yards ; steel works etc.
	5-6-in. 4-5-in.	14 light batteries of which 10 are for defence of the Refinery and one for the seaplane station at Marina di Pisa.	Boom.	(a) Service seaplane station. (b) Seaplane station, ORBETELLO. (c) Aerodrome at PISA. (d) Landing ground.	Barracks : Air force training school. Shipbuilding yards ; railway, canal. Oil fuel depôts ; docks and wharves. Hydrogenation plant ; Refinery. Aircraft factory : Aero engine factory. Power plants. Important torpedo factory. Munition factories, chemical works, metal smelting works.
at natural harbours in the Atlantic : " E " anchorage.	10 batteries. 22-6-in.	3-possibly more, 3-in. or 4-in. guns.	? Boom.	(a) Harbour is suitable for seaplanes.	Nautical training establishment. Small shipbuilding yard.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES—continued

Place.	Description.	Defences.			Air Stations in Vicinity.
		Coast.	Anti-Aircraft.	Booms, etc.	
MONOPOLI ..	—	Not known.			—
NAPLES	Important commercial port, with a "B" anchorage. It is the headquarters of the Lower Tyrrhenian Command, and is regarded as an important strategic repair base in war time.	27 batteries. 7—12-in. 3—11-in. 4—8-in. 8—6-in. 9—4.1-in. 8—3-in. and from 4 to 14 other guns, some of which may be heavy.	37 batteries of 3 to 4 guns each. 4 mobile A.A. batteries. Balloon barrage in position round N.E. end of harbour.	Boom. Defensively mined : submerged obstruction.	Service seaplane station NISIDA Island.
OTRANTO	—	Not known.			—
PANTELLERIA ..	Used by M.A.S.	21 batteries. Mostly 3-in., probably H.A./L.A. 10—4.7-in.	3 batteries and a number of light A.A. defence guns.	—	Two miles S.E. of PanteLLERIA.
POLA and BRIONI Islands.	A secondary naval base and naval training centre ; "B" anchorage.	19 batteries, 10—12 to 12.6-in. 12—11-in. 6—9 to 9.6-in. 20—8-in. mortars. 18—6-in. 38 other guns from 3.9-in. to 5.9-in.	15 batteries. 32—3-in. guns.	Boom : minefield projected.	Service seaplane station at :— (a) SANTA CATERINA Island. (b) RONZI Bay.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES—continued

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Description.	Defences.			Air Stations in Vicinity.	Possible Objectives and Targets.
	Coast.	Anti-Aircraft.	Booms, etc.		
—	Not known.		Boom. Defensively mined.	—	S.I.A.P. oil tanks.
Special port, with a "B" the headquarters of the Command, and is an important strategic time.	27 batteries. 7—12-in. 3—11-in. 4—8-in. 8—6-in. 9—4.1-in. 8—3-in. and from 4 to 14 other guns, some of which may be heavy.	37 batteries of 3 to 4 guns each. 4 mobile A.A. batteries. Balloon barrage in position round N.E. end of harbour.	Boom. Defensively mined : submerged obstruction.	Service seaplane station on NISIDA Island.	Vacuum refinery. Oil storage tanks. Refitting works and dry docks. New dry docks. Gas, engineering and boiler works. Naval port and dockyard area. Power station. Central electricity works. Submarine base, torpedo factory and arsenal. Aircraft factories.
—	Not known.		Boom. Defensively mined.	—	—
—	21 batteries. Mostly 3-in., probably H.A./L.A. 10—4.7-in.	3 batteries and a number of light A.A. defence guns.	—	Two miles S.E. of Port of PANTELLERIA.	Aerodrome : fuel depôt.
base and naval training storage.	19 batteries, 10—12 to 12.6-in. 12—11-in. 6—9 to 9.6-in. 20—8-in. mortars. 18—6-in. 38 other guns from 3.9-in. to 5.9-in.	15 batteries. 32—3-in. guns.	Boom : minefield projected.	Service seaplane stations at :— (a) SANTA CATERINA Island. (b) RONZI Bay.	Naval dockyard : S/M base. Naval oil fuel depôt. War material factory. Power and W/T station. Seaplane station.

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PORTO FERRAJO (Isle of Elba)	Being developed as a S/M and light craft base. A "C" anchorage suitable for cruisers and a few capital ships.	3 batteries. 1-6-in. 7-4.7-in.	A.A. defences North and North-west of Ilva Works.	Boom. Defensively mined: Elba to Sardinia mined.	—
POZZUOLI ..	—	(Included in General Defence Scheme of Naples.)	—	Boom. Defensively mined.	—
SAVONA	Commercial port.	Number and extent of armament now uncertain. Six long range batteries reported.	Not known.	A/S net.	Surroundings too moun- ous.
SPEZIA	The most important main base of the Italian Navy which provides accommodation for a large fleet. A fine natural harbour with a "B" anchorage.	30 batteries. 4-15.7-in. 2-13.5-in. 30-11-in. 40 to 50-9.4-in. 25-5.8-in. 5-4.7-in. 15-2.2-in. Also Bofors guns.	25 batteries. Probably 3-in. guns.	Boom. Defensively mined: SPEZIA to MADDALENA also mined.	Service seaplane at at — (a) MUGGIANO (b) CADIMARE Service aerodrome SARZANA.
TARANTO	The second most important naval base in Italy. It is the principal repair base of the Italian fleet and the headquarters of the Lower Adriatic Command. An "A" anchorage which is completely sheltered.	19 batteries. 2-15.7-in. 2-12-in. 7-8-in. 16-4.7 or 6-in.	24 batteries. Probably all 3-in. guns. Balloon barrage flying at 4,500 ft.	Boom. Defensively mined. A/S net.	(a) Service seaplane (b) Service aerodrome

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as a S/M and light anchorage suitable for capital ships.	3 batteries. 1-6-in. 7-4-7-in.	A.A. defences North and North-west of Ilva Works.	Boom. Defensively mined: Elba to Sardinia mined.	—	Ilva iron and steel works. Oil storage installation. Submarine and light craft base.
	(Included in General Defence Scheme of Naples.)		Boom. Defensively mined.	—	Silurificio Italiano.
	Number and extent of armament now uncertain. Six long range batteries reported.	Not known.	A/S net.	Surroundings too mountain- ous.	Fuel depôt. Iron and steel works; docks. Railway, coaling quay area: junction of main line from TURIN to GENOA and ROME.
main base of the Italian provides accommodation A fine natural harbour age.	30 batteries. 4-15-7-in. 2-13-5-in. 30-11-in. 40 to 50-9-4-in. 25-5-8-in. 5-4-7-in. 15-2-2-in. Also Bofors guns.	25 batteries. Probably 3-in. guns.	Boom. Defensively mined: SPEZIA to MADDALENA also mined.	Service seaplane station at:— (a) MUGGIANO. (b) CADIMARE Cove. Service aerodrome at SARZANA.	Dockyard and town. Refinery. Oil fuel tanks. Submarine base and workshops. Arsenal. Dockyard. Dry docks. Coal sheds. Eastern industrial area. Building yard and torpedo factory. Shipyards and Ordnance works. Munition store area. Guncotton depôt and powder store area. Seaplane station. Mechanical works.
important naval base in principal repair base of the headquarters of Command. An "A" completely sheltered.	19 batteries. 2-15-7-in. 2-12-in. 7-8-in. 16-4-7 or 6-in.	24 batteries. Probably all 3-in. guns. Balloon barrage flying at 4,500 ft.	Boom. Defensively mined. A/S net.	(a) Service seaplane station. (b) Service aerodrome.	Naval and commercial oil stocks. Naval dockyard. Submarine base. Destroyer base. Seaplane station. Shipbuilding yard. Swing bridge. Water supply via an Aqueduct. Railway. Naval W/T station. PASSAGIO PICCOLO.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES—continued

Place.	Description.	Defences.			Air Stations in Vicinity.
		Coast.	Anti-Aircraft.	Booms, etc.	
TRIESTE	An "A" anchorage with all the resources of a modern dockyard. Largest passenger port in Italy.	13 batteries. 4 to 8—6-in. 35—3-in.	13 batteries. 41—3-in. Also mobile batteries.	Boom.	Civil seaplane station.
VENICE	The principal commercial port in the Adriatic with a "D" anchorage. It is a secondary naval base and the headquarters of the Commander-in-Chief, Upper Adriatic.	26 batteries. 4—15-in. 20—12.5-in. 8—11-in. 22—9.4-in. 47—6-in. 45—4.7-in. 41—2.2 to 3.9-in.	10 batteries. Number of A.A. guns not known. Defences including mobile units probably extensive.	Boom.	(a) Service seaplane station at S. ANDREA. (b) Service aerodrome FORT S. NICOLO.
ZARA	An "A" anchorage secure from seaward observation.	4 batteries. 4—11-in. 8—3-in.	Not known.	Boom. Defensively mined.	Service seaplane station.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES—continued

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Description.	Defences.			Air Stations in Vicinity.	Possible Objectives and Targets.
	Coast.	Anti-Aircraft.	Booms, etc.		
with all the resources of Largest passenger	13 batteries. 4 to 8—6-in. 35—3-in.	13 batteries. 41—3-in. Also mobile batteries.	Boom.	Civil seaplane station.	Commercial oil stocks and Refinery. Shipbuilding and repair yards. Aircraft factory. Blast furnaces and steel works. Engine and boiler works. Gas works. Timber yard. Vegetable oil refinery. Electrical transformer station. W/T station. Railway, water supply.
Commercial port in the Adriatic orage. It is a secondary headquarters of the Chief, Upper Adriatic.	26 batteries. 4—15-in. 20—12.5-in. 8—11-in. 22—9.4-in. 47—6-in. 45—4.7-in. 41—2.2 to 3.9-in.	10 batteries. Number of A.A. guns not known. Defen- ces including mobile units probably ex- tensive.	Boom.	(a) Service seaplane station at S. ANDREA. (b) Service aerodrome near FORT S. NICOLO.	Electric power station. Naval dockyard including torpedo store, minor repair shipyard. Government arsenal and war material factory. Large naval and commercial oil stocks. Refinery.
Secure from seaward	4 batteries. 4—11-in. 8—3-in.	Not known.	Boom. Defensively mined.	Service seaplane station.	Commercial oil stocks. Water supply. Military establishments. W/T station.

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DODECANESE ARKI	Small Island.	Number of batteries, position and calibre of guns not known.	Minor defences.	—	
KALIMNO	Port KALIMNO; semi-circular bay, four cables side; shallow S/Ms. use some anchorages in island.	9 batteries. 2.5-in. to 7-in. known. Number and calibre of other guns, not known.	17 batteries An unknown number of probably 3-in. guns. 2 A.A. machine guns.	—	(a) Aerodrome under struction.
KASTELORIZO ..	Small harbour of KASTELORIZO and a sheltered anchorage outside neighbouring Port MANDRAKI: reported S/M base under construction.	A fort with 6-in. guns.	1 battery of A.A. guns.	—	(b) Buoys laid out for planes.
KHALKIA, ALIMNIA and small adjacent islands.	Small harbour in EMPORIO Bay, KHALKIA, another small harbour in ALIMNIA Island.	7 batteries. 4—4.7-in. 5—probably 3 in.	4 A.A. guns at KHALKIA.	—	—
KOS	Anchorage in KOS Road.	12 batteries. 2—8.6-in. 12—4.7-in. Also mobile batteries of field guns and machine guns.	13 batteries. 21, probably more, 3-in. 1 mobile battery.	—	(a) Aerodrome under struction.
LERO	Port LAKI; "C" anchorage; harbour 16 cables long by 5 wide; entrance 2½ cables wide, well sheltered. PARTHANI Bay "D" anchorage. ALINDA Bay "E" anchorage.	55 batteries. 19—15-in. or 16.5. At least 175 other guns of various calibres up to 12-in. Torpedo batteries. Hydrophones. Searchlights.	45 A.A. batteries. 3.9-in., 3 to 4 guns in each battery. Searchlights.	Booms. Defensively mined.	(a) Seaplane station.

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	Number of batteries, position and calibre of guns not known.	Minor defences.	—	—	W/T station. Barracks.
semi-circular bay, four allow S/Ms. use some nd.	9 batteries. 2.5-in. to 7-in. known. Number and calibre of other guns, not known.	17 batteries An unknown number of probably 3-in. guns. 2 A.A. machine guns.	—	(a) Aerodrome under construction.	Fuel storage depôts. W/T. Ammunition storage depôts. Barracks.
KASTELORIZO and a age outside neighbouring CI: reported S/M base m.	A fort with 6-in. guns.	1 battery of A.A. guns.	—	(b) Buoys laid out for sea- planes.	Munition depôt. W/T station.
PORIO Bay, KHALKIA, harbour in ALIMNIA	7 batteries. 4—4.7-in. 5—probably 3-in.	4 A.A. guns at KHALKIA.	—	—	W/T station at KHALKIA. V/S station at ALIMNIA.
Road.	12 batteries. 2—8.6-in. 12—4.7-in. Also mobile batteries of field guns and machine guns.	13 batteries. 21, probably more, 3-in. 1 mobile battery.	—	(a) Aerodrome under construction.	Barracks; magazines. Oil tanks. Power station.
" anchorage; harbour by 5 wide; entrance ell sheltered. " D " anchorage. " anchorage.	55 batteries. 19—15-in. or 16.5. At least 175 other guns of various calibres up to 12-in. Torpedo batteries. Hydrophones. Searchlights.	45 A.A. batteries, 3.9-in., 3 to 4 guns in each battery. Searchlights.	Booms. Defensively mined.	(a) Seaplane station.	Barracks. Dry and floating docks. Magazines. Naval H.Q. Oil tanks. Factory for assembly of seaplanes. Minefilling factory. 4 W/T stations. Observation posts.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES—continued.

Place.	Description.	Defences.			Air Stations in Vicinity.
		Coast.	Anti-Aircraft.	Booms, etc.	
LIPSO	Small sheltered harbour; reported that stations are equipping it as a S/M base.	3 batteries.	1 machine gun battery.	Searchlight.	—
NISERO and adjacent small islands.	Fairly good anchorage off MANDRAKI; exposed anchorage in LIVADIA Bay (PISKOPi).	NISERO—no information. YALI—2 heavy guns. KANDELIUSA—searchlight.	YALI: 2 A.A. guns of ? calibre.	—	(a) Small seaplane base NISERO. (b) Aerodrome under construction on YALI.
PATMOS	Port GRIKO sheltered. Port SKALA unsheltered. Other small bays used by S/Ms.	9 batteries. At least 10 guns, probably 5-9-in.	6 batteries.	Defensively mined.	Anchorage for seaplanes.
RHODES	Three small harbours at RHODES Town, and a small harbour at LINDOS.	22 batteries. About 40 guns of unknown calibre probably 6 in. or more and about 30 guns known to be 6-in.	12 A.A. batteries probably about 4-3-in. guns per battery.	A/S boom. Defensively mined.	(a) 6 aerodromes.
SCARPANTO ..	PEGADIA Bay; sheltered from N.W. winds; unsheltered from N.E. and E. winds.	9 batteries: SCARPANTO. 4 batteries: KASO. 3 batteries: SARIA. Some 6-in. and 5-9-in. guns on the island. Searchlights.	12 A.A. batteries.	Boom. SCARPANTO to STAMPALIA mined.	(a) Seaplane station.

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BRIEF SUMMARY OF PORTS AND THEIR DEFENCES—continued.

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Description.	Defences.			Air Stations in Vicinity.	Possible Objectives and Targets.
	Coast.	Anti-Aircraft.	Booms, etc.		
...bour; reported that ...ping it as a S/M base.	3 batteries.	1 machine gun battery.	Searchlight.	—	—
...age off MANDRAKI; ...e in LIVADIA Bay	NISERO—no information. YALI—2 heavy guns. KANDELIUSA —searchlight.	YALI: 2 A.A. guns of ? calibre.	—	(a) Small seaplane base on NISERO. (b) Aerodrome under con- struction on YALI.	Barracks. Ammunition stores.
...tered. Port SKALA ...er small bays used by	9 batteries. At least 10 guns, probably 5-9-in.	6 batteries.	Defensively mined.	Anchorage for seaplanes.	W/T station. Barracks. Ammunition depot. Observation posts.
...s at RHODES Town, ...ur at LINDOS.	22 batteries. About 40 guns of unknown cali- bre probably 6 in. or more and about 30 guns known to be 6-in.	12 A.A. batter- ies probably about 4-3-in. guns per battery.	A/S boom. Defensively mined.	(a) 6 aerodromes.	Fuel depôts. Magazines. Barracks. Power station, W/T station. Observation posts.
...sheltered from N.W. ...ed from N.E. and E.	9 batteries : SCARPANTO. 4 batteries : KASO. 3 batteries : SARIA. Some 6-in. and 5-9-in. guns on the island. Searchlights.	12 A.A. batteries.	Boom. SCARPANTO to STAMPALIA mined.	(a) Seaplane station.	Barracks. Ammunition, bomb and petrol stores.

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STAMPALIA	Defended naval base; MALTEZANA Harbour, $1\frac{1}{2}$ miles long by $\frac{1}{2}$ mile wide; used as a base for S/Ms.	29 batteries. 20 or more 6 in. 23 or more 3-9 in.	10 A.A. batteries probably 3-in. guns.	Booms. Defensively mined.	(a) Seaplane station. (b) Airport.
SYMI	PETHI Harbour; small but good holding ground, sheltered except from N.E. PANIERO Harbour sheltered from all winds, suitable for small vessels; holding ground not good.	7 batteries.	4 batteries— No. of guns unknown.	Defensively mined.	—
ALBANIA DURAZZO	A port of strategic interest, as a point of disembarkation of troops and war material, and as the centre of export of Albania's trade: new harbour.	4 batteries, mostly 3-in. guns, 2 batteries 9 to 11-in. guns proposed.	7 batteries. Mostly 3-in. guns.	Boom. Defensively mined.	—
PORTO EDDA	Harbour nearly $1\frac{1}{2}$ miles wide, receding $\frac{1}{2}$ mile, sheltered from all but westerly winds: used by Italian Navy.	3 batteries.	2 batteries.	Defensively mined.	—
VALONA and SASENO ISLAND.	The port of the oilfields, and for disembarkation of troops and war material: the port of VALONA is at SKALA, 1 mile S. of VALONA. SASENO ISLAND: Used by the Italians as an advanced naval base for S/Ms and destroyers. The harbour of S. NICOLO is an excellent one with safe accommodation in all weathers.	14 batteries. 8—12-in. 8—6-in. probably more.	8 batteries, probably 3-in. guns. Also A.A. machine guns.	Booms. Defensively mined.	(a) ADRIA AERO Lloyd Aerodrome, S. SKALA, near PELASGIA. (b) Seaplane base at anchorage at ARTI and SAMANA Pt. (c) Landing ground, SASENO Island.

Declassified E.O. 12356 Section 3.3/NND No. 785015

Maltezana long by 1/4 mile wide; is.	29 batteries. 20 or more 6 in. 23 or more 3-9 in.	10 A.A batteries probably 3-in. guns.	Booms. Defensively mined.	(a) Seaplane station. (b) Airport.	Barracks. Oil tanks. Naval base. W/T stations. Observation posts.
all but good holding apt from N.E. sheltered from all small vessels; holding	7 batteries.	4 batteries— No. of guns unknown.	Defensively mined.	—	Military camps. W/T station Small benzine store. Ammunition stores. Power station.
interest, as a point of troops and war centre of export of new harbour.	4 batteries, mostly 3-in. guns, 2 batter- ies 9 to 11-in. guns proposed.	7 batteries. Mostly 3-in. guns.	Boom. Defensively mined.	—	Oil storage tanks. Defence batteries. Road bridges. Power station. W/T station. Factories.
iles wide, receding from all but westerly than Navy.	3 batteries.	2 batteries.	Defensively mined.	—	Barracks. W/T stations.
ads, and for disem- v and war material : ONA is at SKALA, A. Used by the Italians al base for S/M.s and rbour of S. NICOLO with safe accommoda-	14 batteries. 8—12-in. 8—6-in. probably more.	8 batteries. probably 3-in. guns. Also A.A. machine guns.	Booms. Defensively mined.	(a) ADRIA AERO Lloyd Aerodrome, S. of SKALA, near PELASGIA. (b) Seaplane base and anchorage at ARTA and SAMANA Pt. (c) Landing grounds, SASENO Island.	KUSBABA petrol store. The SKALA. Gun battery positions. SASENO : Port St. NICOLO. Barracks area.

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(6) Air Force

(i) The Italian Air Force is constituted, as follows:—

(a) Air Force in Metropolitan Italy.

(b) Overseas Commands.

(ii) The Metropolitan Air Force is divided, as follows:—

No. 1 Squadra Aerea	..	H.Q., Milan.
No. 2 Squadra Aerea	..	H.Q., Padua.
No. 3 Squadra Aerea	..	H.Q., Rome.
No. 4 Squadra Aerea	..	H.Q., Bari.
Naval Air Commands:—		
Higher Adriatic Command	..	H.Q., Venice.
Lower Adriatic Command	..	H.Q., Taranto.
Higher Tyrrhenian Command	..	H.Q., Spezia.
Lower Tyrrhenian Command	..	H.Q., Naples.
Fleet Air Arm	..	Shipborne.

(iii) Overseas Commands are as follows:—

No. 5 Squadra Aerea, North Africa	H.Q., Derna.
Colonial and Saharan Air Forces,	
North Africa	H.Q., Mellaha and Hon.
Sicilian Air Force	H.Q., Palermo.
Sardinian Air Force	H.Q., Cagliari.
Albanian Air Force	H.Q., Tirana.
Aegean Air Force	H.Q., Rhodes.

A Squadra Aerea, or Air Corps, is composed of a varying number of bomber and fighter Stormo, or Regiments. A Stormo comprises two Gruppi, or Wings. In a Bomber Stormo, each Gruppo consists of two Squadriglie, or Squadrons, of nine aircraft each (I.E.). In a Fighter Stormo, each Gruppo consists of three Squadriglie of 12 aircraft each (I.E.).

ITALIAN AIR FORCE—1st OCTOBER, 1942

The estimated operational first-line strength of the Italian Air Force on the 1st October, 1942, was as follows:—

Long-range Bombers	..	385
Dive Bombers	..	15
S.E. Fighters	..	815
Army Co-op and Recco.	..	170
Coastal	..	215
Total	..	1,600

AIRCRAFT PERFORMANCES—SERVICE TYPES

For Aircraft Performances—Service Types—see C.B. 4016A.

For Aerodromes in Sardinia, Sicily and Pantelleria see C.B. 4057D, Naval Air Pilot Mediterranean Section I.

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SECTION VI

PORTS, ANCHORAGES AND THEIR DEFENCES

ALBANIA

BOJANA RIVER

(Lat. 41° 52' N., Long. 19° 23' E.)

(1) General Remarks

The BOJANA River has its source at SCUTARI, Lat. 42° 03' N., Long. 19° 31' E., on Lake SCUTARI and flows for 24 miles to the Sea at PULAJ. Lat. 41° 52' N., Long. 19° 24' E., about 10 miles West-North-Westward of SAN GIOVANNI DI MEDUA. The left bank of the river is in ALBANIA and the right bank in YUGO-SLAVIA for the lower half of its course. The upper half is in ALBANIA.

The width of the river varies between 100 to 150 yards; the depth of the channel is 7 to 8 ft. in summer and 13 to 16 ft. in winter below OBOT, position Lat. 41° 59' N., Long. 19° 26' E., and vessels not exceeding 50 tons, except the "Yolanda" which is 88 tons and maintains a service between SCUTARI and SAN GIOVANNI DI MEDUA, and drawing 5 ft. or less can complete the journey beyond OBOT to SCUTARI. The current is very rapid—up to 7 knots—in winter, but is normally about 3 knots in summer. The river banks are about 9 ft. high; the country is flat on either side and thickly populated.

The depth on the bar is about 4½ ft. and there is 5 fathoms of water half a cable on the seaward side.

Italian ships anchor 300 yards off the mouth of the BOJANA River, discharge troops and material into barges which are then towed up to SCUTARI. There is, as a rule, a considerable concentration of these barges at OBOT, about half-way to SCUTARI. The journey from PULAJ to SCUTARI takes about 5 hours.

(2) Port Facilities

A wooden jetty is in process of construction at PULAJ.

(3) The Town

PULAJ is a village consisting of about a dozen white houses with red roofs. SCUTARI stands on the banks of SCUTARI Lake at the source of the BOJANA River. It has a population of about 24,000. OBOT Village consists of a few stone houses, a Barracks and some thatched cottages.

The Italians hope to make SCUTARI a centre for provisioning the army: much material is now concentrated here.

(4) Government Establishments

In SCUTARI there are Barracks.

Lake SCUTARI and flows for 24 miles to the sea at PULAJ. Lat. 41° 32' N., Long. 19° 24' E., about 10 miles West-North-Westward of SAN GIOVANNI DI MEDUA. The left bank of the river is in ALBANIA and the right bank in YUGO-SLAVIA for the lower half of its course. The upper half is in ALBANIA.

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(4) Government Establishments

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(10) Transport Facilities

Roads

There is a road, recently repaired, from PULAJ to BERDIDI.

There is a motor road 15 miles long between PULAJ and SCUTARI: the greater part of this road passes through swampy ground and traffic is hampered in winter by floods. Some effort, however, is being made to improve it.

(12) Defences

Anti-Aircraft Defences

A.A. Batteries are sited as follows:—

- No. 1. SCUTARI. In old Fort on East side of BOJANA River.
- No. 2. Port of SCUTARI.
- No. 3. Mt. TARABOS.

80 DURAZZO

DURAZZO

(Lat. 41° 18' N., Long. 19° 27' E.)

(See Admiralty Chart 1590 and Plan 85)

(1) General Remarks

Over half of ALBANIA's imports and exports for the last four years have passed through the Port of DURAZZO. It is also estimated that 80 per cent. of the traffic between ITALY and ALBANIA is handled at DURAZZO. The Italians have an important strategic interest in this Port primarily as a point of disembarkation of troops, munitions and stores for their garrisons in ALBANIA, for possible operations against YUGOSLAVIA and GREECE, and as a Naval Base. The exploitation of ALBANIAN minerals will increase the trade of the Port. In November, 1940, it was reported that convoys arrive at DURAZZO every 10-15 days at irregular intervals, usually escorted by two destroyers.

(2) Port Facilities

The Eastern Mole is 1,350 yards long and carries two pipelines: large tankers berth on the inner side: in fair weather ships can berth on the outer side. The Western Mole is 1,100 yards long. It has a narrow-gauge railway line. Two ships 500 ft. long, two of 230 ft. and two of 400 ft. have been seen alongside this mole. On the same occasion there was a tanker alongside the Eastern Mole and about eight other cargo ships and two destroyers were in the harbour, and there were other ships lying outside near the entrance.

Six ships of up to 10,000 tons each can berth and discharge simultaneously.

The Port has now an area of 8,720,000 sq. ft. with a depth of water of 24 ft. The total quayage is about 5,248 ft., and the available area on the quays and piers is about 98,000 sq. ft.

Further construction work is in progress, including a further quay, 1,300 ft. long and some more warehouses, stores, etc., will be erected.

The area of the harbour is enclosed by two main breakwaters.

Lifting Appliances

There is a 40-ton Floating Crane and three small Floating Cranes. New equipment is being installed for handling shipments of iron ore to ITALY.

Harbour Craft

There are one Steam Tug, eleven large Lighters and thirteen Caiques.

(3) The Town

There are about 10,000 inhabitants, mostly Moslem. The so-called Industrial Area is to the North-East along the TIRANA Road. There is no Hospital, but there is both a Civil Hospital and a Military one at TIRANA, both good.

There are four fountains which are just capable of supplying drinking water for the population. Abundant wells of hard water exist. Recent information suggests that the local water has become undrinkable, owing to malaria, and that the main supply is brought from ITALY. The Post and Telegraphic Offices are in the Prefecture, situated near the main square on the TIRANA Road.

(4) Government Establishments

The Admiralty building is on the East side of the town facing the Harbour. To the North of this building is the army headquarters; the Port Office is on the MOLO DI PONENTE, and to the South of it, on the MOLO are warehouses.

The Naval Barracks are in use and about 200 men are accommodated there.

The Gendarmerie School is also in full use and accommodates approximately 200.

The Motor Transport Depot, situated on the right of the DURAZZO-TIRANA Road, consists of a corrugated iron shed, about 180 ft. by 90 ft. It has a military guard and is

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The Gendarmerie School is also in full use and accommodates approximately 200.

The Motor Transport Depot, situated on the right of the DURAZZO-TIRANA Road, consists of a corrugated iron shed, about 180 ft. by 90 ft. It has a military guard and is believed to contain armoured cars of old Italian pattern and military transport not at present in use.

(5) Commercial Establishments

Fuel Storage

(i) There is an A.G.I.P. depot sited at the Northern end of the MOLO DI LEVANTE. It consists of one Diesel oil and two petrol tanks, each of 800 tons capacity. There is a pipeline from the depot to the oiling jetty.

(ii) There is a large underground petrol depot in a wood near the village of ARAPAJ, 3 miles East of DURAZZO.

(iii) There is a dump of petrol and oil, amounting to about 2,000 tons, stowed in drums, which is sited near SIJAK on the right-hand side of the road which runs East-North-East from DURAZZO to TIRANA via SIJAK; tanks are above ground and camouflaged with reeds or heather thatch. On the opposite side of the road is a large dump of empty drums. These are out in the open.

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Factories

There are two flour mills, which are conspicuous from seaward, and a cigarette factory.

(7) Air Facilities

Military Aerodrome

DURAZZO Aerodrome is being built 1½ miles from the Village of SIJAK on the DURAZZO-SIJAK Road—East-North-East of DURAZZO.

Civil Aerodrome

At the beginning of 1939, work was started on the construction of a Civil Aerodrome by Ala Littoria, being part of the large scheme which this company is carrying out for the improvement of air facilities in ALBANIA. (See Section IV (3).) The Aerodrome is situated about a mile to the North of the centre of the Town on the right-hand side of the Road to PORTA ROMANA.

Seaplane Anchorage

There is a Seaplane Anchorage on the South-Eastern part of the Harbour between the old wooden pier and South-Eastern Breakwater. Fuel is obtained from A.G.I.P. fuel pump. There is one mooring buoy. It is not at present in use.

(8) War Material Factories

Nil

(9) Power Plants

There is an efficient Power Station at DURAZZO containing—

One 255 h.p. Campbell engine.

Two 95 h.p. Czechoslovak engines (old, but in very good order).

It is situated on the road to TIRANA.

(10) Transport Facilities

Rail

Work on the railway projected from DURAZZO to TIRANA, which was abandoned owing to lack of funds, is now believed to have recommenced.

A Railway is also under construction from DURAZZO to ELBASAN and LABINOT (8 miles North-East of ELBASAN): 5,000 men are employed and the work is being pushed on as fast as possible.

Roads

SCUTARI-PUKA Road

The Road has been completed from SCUTARI to KORTHUPULA on the Western edge of the GEMSICE Valley. The Valley is about 500 ft. deep and necessitates the use of "serpentines" for the Road. The distance down one side and up the other is about 3 miles. The plan for the Bridge over the GEMSICE River calls for two large and two subsidiary spans of concrete. The bridge will be about 300 ft. in length and about 100 ft. high.

From the Eastern edge of the Valley, the road bed has been completed to PUKA, a distance of about 7 miles. This section requires only surfacing and a certain amount of repair. The specification for the road calls for an effective width of 19½ ft., 65½ ft. minimum radius on curves, 6 per cent. maximum gradient and 39 ft. radius on serpentine. The serpentine gradients are compensated.

The construction is good and shows every sign of careful and lasting workmanship. The work is being carried out by forced labour under government engineers, no contractors being employed.

SCUTARI-TIRANA Road

This Road is in a good condition: repairs have been carried out by the Italians on a

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The construction is good and shows every sign of careful and lasting workmanship. The work is being carried out by forced labour under government engineers, no contractors being employed.

SCUTARI-TIRANA Road

This Road is in a good condition: repairs have been carried out by the Italians on a large section. Vulnerable points are: (1) Bridge, near foreshore, 700 yards East of MOLO DI LEVANTE; (2) Bridge 2½ miles South-East from MOLO DI LEVANTE.

DURAZZO-TIRANA Road

This Road is in good order, but has a very loose surface: it is called VIA LITTORIA.

The new road from KRUIJA to MURA has been opened, but the surface is very rough.

DURAZZO-ZOG'S PALACE Hill

A new straight road has been built leading to the Palace Hill where Defences are in course of construction.

Air

A very efficient Italian Air Service connects TIRANA with SCUTARI, KORCA, ELBASAN, and VALONA, and there is a service connecting TIRANA with ROME three times a week each way by the Adria Aero Lloyd.

There is a service linking up BRINDISI, DURAZZO and TRIESTE.

A TIRANA-SCUTARI-BUKAREST service via SKOPLJE and BELGRADE is in operation.

(C46758)

H

S2 DURAZZO

(11) Signal Communications

There is a W/T Station on RASTBUL Hill and a small W/T set at the Naval Barracks, the position of which is not known. It is probably only used to communicate with the Fleet.

Reception is reported to be good in DURAZZO.

There is a semaphore on RASTBUL Hill.

Telegraph and Telephone communications exist between DURAZZO and TIRANA.

(12) Defences

(i) Sea Front Defences

Coast Defence Batteries

The Batteries are camouflaged with trees.

Battery No. 1.—This Battery—position approximately Lat. $41^{\circ} 19' N.$, Long. $19^{\circ} 25' E.$ —is reported to consist of four guns of 3-in. calibre.

Approximate arcs of fire are as follows:—

No. 1 Gun	..	..	..	..	..	260°-360°
No. 2 Gun	..	..	..	..	..	200°-360°
No. 3 Gun	..	..	..	..	..	180°-300°
No. 4 Gun	..	..	..	..	..	150°-280°

Battery No. 2.—This Battery which is situated on the low cliffs West of the Palace Gardens consists of 4 guns of 4.7-in. calibre with an arc of fire of approximately 180° - 335° . The Control Tower which is situated at the highest point contains a 9 ft. Rangefinder.

Battery No. 3.—This Battery, which bears about 120° from Battery No. 2 and is about 600 yards from it, consists of three low angle guns of about 3-in. calibre. It is actually situated at the North-Western end of the OLD VENETIAN WALL. This wall terminates in a martello-like Tower, the top of which is flush with the wall. One gun is on the Tower and the other two are a few yards from it and to the North-West. Except for the small arc denied to these two guns by the tower itself, the arc of fire of the Battery is approximately 120° - 300° .

Battery No. 4.—Sited 1 mile South-East from the Oil Tanks, four guns of 3-in. or 4.7-in. calibre.

An Observation Tower situated behind Battery No. 2 is large enough to accommodate the guns crews. No R.F. was observed. A concrete Observation Post with a small window looking North is situated 300 yards North of the Battery. It appears to be connected by telephone with No. 2 Battery.

It is planned to erect a Battery of two guns of 9.5-in. or 11-in. calibre on KING ZOG'S PALACE Hill.

(e) Local Defences

Wire Entanglements.

Vast quantities of poles for Barbed Wire Entanglements are being landed. It is not known where these are to be erected.

(g) Magazines

There are Munition Depôts in KADAR village and wood on the TIRANA-DURAZZO Road, near TIRANA.

Approximate arcs of fire are as follows:—

No. 1 Gun	..	..	..	..	260°-360°
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(g) Magazines

There are Munition Depôts in KADAR village and wood on the TIRANA-DURAZZO Road, near TIRANA.

(iv) Local Seaward Defences

Minefields

Reported mined: vessels bound for DURAZZO are instructed to steer a course parallel to the shore and to be either 1 or 12 miles out.

Boom

Boom Defence is in position; it consists of 3 lines of nets.

(v) Local Air Defences

A.A. Batteries

A.A. Battery No. 1.—Sited North-West of the Town probably on Hill 242. (?) five A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 2.—Sited on KING ZOG'S PALACE Hill. (?) four A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 3.—Sited on the more Westerly of two Venetian Towers. One or more A.A. guns of (?) 3-in. calibre.

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A.A. Battery No. 4.—Sited at the South end of DURAZZO. (?) four guns of (?) 3-in. calibre.

A.A. Battery No. 5.—Six A.A. guns of (?) 3-in. calibre were installed in DURAZZO in May, 1940: the position of this A.A. Battery is not known.

A.A. Battery No. 6.—Sited on RASTBUL Hill. (?) Four A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 7.—Sited at the Rock of KAVAJA, about 6 miles to the South-Eastward of DURAZZO. (?) Four A.A. guns of (?) 3-in. calibre.

(13) Reconnaissance

The beach to the North of DURAZZO is narrow, with steep cliffs, and marshy land extends beyond it for some three to four Statute miles. The sand is firm and hard. The water is shallow and in places there is less than 5 ft. for a distance of 80 yards from the beach.

To the South-East of DURAZZO, the ground between the beach and the DURAZZO-TIRANA Road is flat and low lying with some cultivation.

EDDA, PORTO (SANTA QUARANTA)

(Lat. 39° 50' N., Long. 20° 01' E.)

(See Admiralty Chart 206.)

(1) General Remarks

PORTO EDDA, which lies 4 miles North-Eastward of the entrance to CORFU north channel is nearly $1\frac{1}{2}$ miles wide and recedes $\frac{1}{2}$ mile. It is sheltered from all but Westerly winds. There is 30 fathoms of water $\frac{1}{2}$ mile from the coast.

The harbour is used by the Italian Navy: two cruisers and three transports have been seen in harbour together.

(2) Port Facilities

Anchorage

Large vessels anchor near the middle of the bay in depths of 15 to 17 fathoms—mud and sand; small craft shelter in the Northern part, not far from the Customs House.

Piers

There is a stone pier, with deep water alongside, and there are five wooden piers along the shore of the bay. In the Northern corner of the bay there are a further two stone piers, about 40 ft. long, with a depth of 5 ft. alongside. There are no wharves for ocean-going vessels and no warehouses. Cased petrol is landed at a small jetty in LIMION Bay, West Port. Port improvements are in hand, but no details are available.

Lifting Appliances

There is none.

(3) The Town

PORTO EDDA is, at present, not much more than a large village, but it has grown considerably during the last few years, and may continue to do so.

(4) Government Establishments

New Barracks have been built.

(5) Transport Facilities

Roads

EDDA, PORTO (SANTA QUARANTA)

(Lat. 39° 50' N., Long. 20° 01' E.)

(See Admiralty Chart 206.)

(1) General Remarks

PORTO EDDA, which lies 4 miles North-Eastward of the entrance to CORFU north channel is nearly 1½ miles wide and recedes ¼ mile. It is sheltered from all but Westerly winds. There is 30 fathoms of water ½ mile from the coast.

The harbour is used by the Italian Navy: two cruisers and three transports have been seen in harbour together.

(2) Port Facilities

Anchorage

Large vessels anchor near the middle of the bay in depths of 15 to 17 fathoms—mud and sand; small craft shelter in the Northern part, not far from the Customs House.

Piers

There is a stone pier, with deep water alongside, and there are five wooden piers along the shore of the bay. In the Northern corner of the bay there are a further two stone piers, about 40 ft. long, with a depth of 5 ft. alongside. There are no wharves for ocean-going vessels and no warehouses. Cased petrol is landed at a small jetty in LIMON Bay, West Port.

Port improvements are in hand, but no details are available.

Lifting Appliances

There is none.

(3) The Town

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(4) Government Establishments

New Barracks have been built.

(5) Transport Facilities

Roads

Roads run to SALONIKA and to YANNINA through DELVINO.

There is a branch road from a point between DELVINO and PORTO EDDA Southward to KONISPOLI, and another road Southward from PORTO EDDA to BUTRANTO.

To the North a road runs to VALONA via BORSH with a branch to VANISHTI.

(11) Signal Communications

Telegraph and Telephone

There is telegraphic and telephonic communication with CORFU, ARGYROCASTRO and YANNINA; the cable from CORFU is landed in the North-Eastern corner of the bay.

W/T

There is a W/T station on the GULF OF BUTRINTO (opposite CORFU) and south of PORTO EDDA.

There is another W/T station in the ruined "Church of the 40 Saints" in PORTO EDDA: it stands on the hill above the town.

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**EDDA, PORTO
PALERMO, PORTO**

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

No. 1 Battery. MONASTERY : on the mountain overlooking the bay. Eight guns of (?) calibre.

No. 2 Battery. PORTO EDDA : mounted in concrete emplacements and sited on the seashore, in the curve of the bay immediately North of the houses of the town. Three guns of (?) calibre.

No. 3 Battery. GULF OF BUTRINTO. (?) guns of (?) calibre (heavy).

(iv) Minefield

PORTO EDDA is defensively mined.

(v) Local Air Defences

Anti-Aircraft Batteries

A.A. Battery No. 1. MONASTERY : on the mountain overlooking the bay. (?) A.A. guns of (?) calibre.

A.A. Battery No. 2. OLD FORT. (?) A.A. guns of (?) 3-in. calibre.

Wire Entanglements and Trenches

The whole area between the foot of the mountain overlooking the bay and HALASMENOS MYLOS (Ruined Mill) has been surrounded by a triple row of barbed wire and is a prohibited area.

PALERMO PORTO AND SPILA BAY

Lat. 40° 03' N., Long. 19° 48' E. (P. PALERMO)

Lat. 40° 06' N., Long. 19° 45' E. (SPILA Bay)

(See Admiralty Chart No. 1589)

(1) General Remarks

(i) PORTO PALERMO

PORTO PALERMO is a bay on the western side of a high ridge of land, a tongue from which projects southwards three-quarters of a mile on its western side and slopes gradually towards KAVADONI Point, its extremity.

The harbour is secure in all weathers except south-westerly gales.

It is of little, if any, importance except as an anchorage.

(ii) SPILA BAY

SPILA Bay lies 3 miles to the north-westward of PORTO PALERMO : here munitions and troops could be landed. It is secure except when the Sirocco blows : it is then highly dangerous.

(2) Port Facilities

(i) PORTO PALERMO

(a) General.—The harbour of PORTO PALERMO is cut in two by a peninsula on which stands S. NICOLO Fort with a few houses to the east of it. This peninsula juts out into the middle of the bay.

In the northern part of the harbour, ARMARIDA Bay, there are depths of 15-35 fathoms and ships of up to 6,000 tons, including small cruisers and destroyers, can lie there.

The southern part of the harbour, PANORMA Bay, is not so deep.

(b) Quays and Jetties.—There are no quays but there is a wooden jetty in the northern part of the harbour : caiques moor stern to the beach : troops could be landed, possibly, by this means.

(c) Harbour Craft.—A small number of caiques and lighters are available.

guns of (?) calibre.

A.A. Battery No. 2. OLD FORT. (?) A.A. guns of (?) 3-in.) calibre.

Wire Entanglements and Trenches

The whole area between the foot of the mountain overlooking the bay and HALASMENOS MYLOS (Ruined Mill) has been surrounded by a triple row of barbed wire and is a prohibited area.

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(b) *Quays and Jetties*.—There are no quays but there is a wooden jetty in the northern part of the harbour: caiques moor stern to the beach: troops could be landed, possibly, by this means.

(c) *Harbour Craft*.—A small number of caiques and lighters are available.

(ii) SPILA Bay

(a) *General*.—At SPILA Bay, which is the business port for the district, there is a huge rock which serves as a quay to which vessels secure. Caiques are carried over the rocks by porters. Livestock, which constitute the main exports of the district, are driven over it and so on board.

A portable wooden jetty is available, but in view of the primitive, but apparently adequate, arrangement described above it is seldom used.

(3) The Town

There is no town: the Harbourmaster, Customs, Gendarmerie and Frontier Guards are all stationed at the Village of SPILA.

(10) Transport Facilities

Road

The road from S. QUARANTA to VALONA passes near to PORTO PALERMO and SPILA Bay.

The harbour at SPILA Bay is connected to the Villages of SPILA and HIMARA by road.

SAN GIOVANNI di MEDUA
VALONA

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SAN GIOVANNI di MEDUA (ALBANIA)

(Lat. 41° 48' 32" N., Long. 19° 35' 16" E.)

(See Admiralty Chart No. 1463)

(1) General Remarks

SAN GIOVANNI di MEDUA is situated nearly 4 miles Northward of the mouth of the DRIN. San GIOVANNI Point is a rocky coast about a mile long and its Eastern extremity forms the Western side of the harbour.

(2) Port Facilities

There is anchorage in SAN GIOVANNI di MEDUA Road in 11 or 12 fathoms sand and mud. There are depths of 16½ ft. in the entrance channel and of 20 to 23 ft. inside. Ships anchor and secure their sterns to one or other of two mooring buoys; they cannot get alongside. There are no warehouses.

Piers and Quays

There are three piers, the longest of which is 70 yards. A new quay for ocean-going ships is projected but it is not known if work has been begun.

Harbour Craft

There are a few caiques and lighters and a water boat with a capacity of 5 tons.

Lifting Appliances

There are no cranes.

(3) The Town

SAN GIOVANNI di MEDUA consists of a few houses on the Northern side of the bay; it is unhealthy in summer.

(4) Government Establishments

Barracks

On the hill close to and above SAN GIOVANNI Point: a large yellow barracks. Very conspicuous from seaward.

The Harbour Office and Customs House are in a small house close to the landing pier.

(12) Defences

Coast Defence Batteries

None reported.

A.A. Batteries

(Mobile) mounted on trucks about 200 yards above the town, eight A.A. guns of (?) 3-in. calibre.

VALONA (ALBANIA) AND SASENO ISLAND

Lat. 40° 30' N., Long. 19° 30' E.

(See Plan 63)

(1) General Remarks

VALONA Bay, which is entered between C. LINGUETTA and C. TREPOTI, about 6 miles to the North Eastward is about 5 miles wide at the entrance, with depths of 10 to 20 fathoms. It shoals towards C. TREPOTI.

The bay is well sheltered except from the North Westward.

There are three piers, the longest of which is 70 yards. A new quay for ocean-going ships is projected but it is not known if work has been begun.

Harbour Craft

There are a few caiques and lighters and a water boat with a capacity of 5 tons.

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(12) Defences

Coast Defence Batteries

None reported.

A.A. Batteries

(Mobile) mounted on trucks about 200 yards above the town, eight A.A. guns of (?) 3-in. calibre.

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(See Plan 63)

(1) General Remarks

VALONA Bay, which is entered between C. LINGUETTA and C. TREPOTI, about 6 miles to the North Eastward is about 5 miles wide at the entrance, with depths of 10 to 20 fathoms. It shoals towards C. TREPOTI.

The bay is well sheltered except from the North Westward.

VALONA

VALONA is the Port of the Oil Fields, with which it is connected by pipeline, and for disembarkation of troops and war material from BARI and there are signs of its development as a NAVAL BASE. Anchorage is in the Bay.

SASENO Island

SASENO Island is situated at the entrance to VALONA Bay (ALBANIA). It extends in a North and South direction for 2½ miles and is 1½ miles wide.

There are two principal peaks, 1,087 and 1,015 ft. high. On the North-East side is a bay named S. NICOLO, which has a shingle beach.

The Island was ceded to ITALY under the terms of the TREATY of TIRANA and is used by the Italians as an advanced naval base particularly by submarines and destroyers. The coast defences are in the main arranged so as to command the OTRANTO Channel.

The harbour of S. NICOLO is an excellent one with safe and ample accommodation in all weathers for six submarines and two destroyers. It is formed between a breakwater on the Northern side of S. NICOLO and a small mole.

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H 3

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(2) Port Facilities VALONA

The Port of VALONA is at the SKALA and is one mile to the South of VALONA. There are two Piers built of concrete and wood.

Piers

The Northern Pier is 250 yards long, 13 ft. wide and has a depth of water of about 20 ft. at the end.

The Southern Pier is 150 yards long, 20 ft. wide and has a depth of water of about 14 ft. at the end.

Small ships can berth both sides of the piers but vessels over 1,000 tons anchor in the bay and discharge into lighters.

There are a number of improvised wooden wharves along the shore.

Anchorage is between the piers and PELASGIA Point Light.

As many as 22 ships, 13 of which were between 5,000 and 15,000 tons, have been seen in the harbour simultaneously.

Harbour Craft

Harbour Craft consist of one small Tug, one Motor Boat, a number of Rowing and Sailing Boats and about 20 Lighters.

Lifting Appliances

10-ton hand travelling crane on rails.

3-ton hand travelling crane on rails.

Warehouses

There are a number of warehouses and sheds and large warehouses are under construction on the road between SKALA and VALONA.

KRIONERO

Transports discharge three miles South of VALONA, at KRIONERO, where they can moor in 5 fathoms. Several jetties have been built here for discharging troops from boats.

SASENO Island

S. NICOLO Harbour.—This Harbour, which is the only one, is situated on the Eastern side of the Island.

It is well protected by two Breakwaters, which are from 15-18 ft. high.

A stone Quay runs the length of the Western side of the Harbour.

There appears to be deep water in the middle of the Harbour and a good six fathoms alongside the Quays.

Lifting Appliances.—One Sheerlegs with a lifting capacity of about 10 tons.

One Crane, power-driven, capacity about 15 tons.

Docks.—There are no Floating or Dry Docks.

(3) The Town

VALONA

The Port at SKALA consists of a few buildings and Warehouses, which belong chiefly to the Petroleum Companies. A few have recently been taken over by Italian Naval Authorities.

The Italian Oil Company is producing about 100,000 tons of crude oil a year.

The chief export is asphalt blocks.

Attempts have been made to re-construct parts of the Town of VALONA, and modern

in the harbour simultaneously.

Harbour Craft

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The Italian Oil Company is producing about 100,000 tons of crude oil a year.

The chief export is asphalt blocks.

Attempts have been made to re-construct parts of the Town of VALONA, and modern buildings such as the Banca d'Italie, the Italian Consulate and one or two Hotels have been erected.

VALONA has a population of about 8,000, two-thirds of whom are Moslem.

The Town is lighted by electricity.

There is a waterworks, but most of the small houses draw their water from wells.

There is one Municipal Hospital with 50 beds and an Operating Theatre.

There is a Post and Telegraph Office situated in the middle of the Town.

SASENO Island

There is no Town in the accepted sense of the word but only certain military establishments.

No fresh water is available on the Island and supplies are brought from the mouth of the VOJUCA River on the mainland (Lat. 40° 39' N., Long. 19° 20' E.) every two days.

KRIONERO

There is an abundance of water at KRIONERO.

(4) Government Establishments

VALONA

The PREFECTURE, the MAIRIE and some small huts housing the GENDARMERIE HEADQUARTERS are the only Government Establishments in the Town. These are all in a very ramshackle and dilapidated condition. There are Military Establishments on both sides of the road between VALONA and SKALA.

Fuel Storage

There are two, possibly three, Underground Oil Tanks, covered with 6 ft. of earth, situated at KRIONERO. Oil is piped down from wells at KUCOVA to these Tanks (see KRIONERO-KUCOVA Pipeline), thence by hose connection to a buoy 220 yards from the end of a small Jetty.

KRIONERO-KUCOVA Pipeline

This pipeline runs from the KUCOVA Oilfield in a Westerly direction, crossing a river and a main North to South road, and follows the general line of the road to FIERI. From there it turns to South-South-West and crosses the river VOYUSA by a road bridge, at a point 15 miles North of KRIONERO. The destruction of this Bridge would cut the Oil supply.

After crossing the VOYUSA the pipeline follows the road to VALONA, which it skirts to the Eastward and continues South to KRIONERO in the Bay of VALONA. Here it is floated in the bay.

Oil from the KUKOVA Oilfield passes through this pipeline and is shipped to Italy for refining.

Coal

Very little coal is available.

There is a Petrol Dump situated near the shore at SKALA.

Between ARTA on VALONA Lake and SAMANA Point, 20 miles to the Northward, along the Coast there are stores of Benzine, Mazout and Oil: these are in dumps and sheds. Further North, as far as SHKUMBI there are further stores of Fuel Oil similarly disposed. There is an important Store of Petrol, said to contain 4 million litres, which is sited in an olive grove on the South side of hill KUSBABA near the road VALONA-KANINA.

Oil Pumping Stations

Oil Pumping Stations are situated at:—

- (a) MIFOL, on the main road to DURAZZO, East of Lake Valona, between PANAJA and FERAS.
- (b) FIER, about 13 miles North of SKALA, along the main road to DURAZZO.
- (c) ROSKOVECI, about 7 miles due East of FIER, along the road, thence to the KUCOVA Oilfield.

SASENO Island

These are confined, so far as is known, to the Military Barracks. Barracks also exist immediately to the East of the O.P. and R.F. Station adjoining No. 2 Battery. All Barracks are substantially built, and consist of stone. In addition each gun Battery has its crew's living quarters situated nearby.

It is presumed that the naval ratings living on the Island are accommodated in one of the Military Barracks. There are three administration buildings and a Fuel Tank.

(5) Commercial Establishments

There are important salt-drying pans 1½ miles North of the Port. VALONA supplies salt for use throughout ALBANIA. The industry is a Government monopoly. Anglo Persian Oil Company have ceased to operate in the area, and all material has been taken over by the Government. They have, however, been offered special terms to renew their concession and

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There is a Bitumen Mill, worked by an Italian Company, situated near the Town Pier. The wells are 15 miles North of VALONA and are connected by a Light Railway with the mill.

(7) Air Facilities

(i) Aerodrome

There is an Aerodrome immediately West of VALONA in position Lat. 40° 26' 45" N., Long. 19° 29' 00" E. Its dimensions are N/S 1,000 yards, E/W 860 yards, and as many as 46 aircraft have been seen dispersed around the landing area.

There is one large hangar in the South-East corner. In the North-West corner there is an Ammunition Depot and several small workshops and other buildings.

The runway, 860 yards long, is on the Western boundary of the landing area and is connected by a tarmac to the hangar in the South-East corner.

Five large buildings, of which two are probably hangars, are under construction along the Eastern side of the aerodrome.

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(ii) Landing Ground

There is a landing ground on the shore three miles South of VALONA in position Lat. 40° 25' 00" N., Long. 19° 30' 00" E. Its dimensions are N/S 620 yards, E/W 150 yards. There are no hangars or workshops.

(iii) VALONA Seaplane Station

This is situated immediately South of the landing ground. There is a large building on the shore which could be used as a hangar.

(iv) ARTA Seaplane Station

Sited at the South end of VALONA Lake: there are five hangars.

(v) SASENO Island

There are two landing grounds on the island: each has one hangar and a workshop.

(vi) There is a Seaplane Station in a small bay just North-East of SAMANA Point which is about 20 miles Northward along the coast from VALONA.

(8) War Material Factories. None.

(9) Power Plants

VALONA

The Electric Power Station is situated about $\frac{1}{2}$ mile East of the Landing Pier, and is operated by the S.E.S.A. Company of Italy.

It consists of:—

One Franco Tosi 5-cylinder Heavy Oil Engine, 150 kw., driving an Alternator.

Two smaller Oil Engines, 75 kw.

SASENO Island

It is believed that an electric cable runs on heavy iron frames from the Harbour to a concrete Reservoir situated about $\frac{1}{2}$ mile to the Southward of the Harbour in a well sheltered hollow. This probably indicates that some sort of Power Station exists for lighting and possibly for other purposes.

(10) Transport Facilities

VALONA

Railways.

There are no Railways.

Tramways

A metre gauge horse tramway runs to both piers and connects them with VALONA.

Roads

The roads are only good where they have been reconstructed by Italian enterprise and German labour. The Road between the Port and the Town is fair. All other roads are exceptionally bad. Motor cars and buses are fairly numerous. There is direct road communication to DURAZZO and thence to SCUTARI, and also to ARGYROCASTRO and thence to the Greek Frontier.

Steamship

There is, in normal times, a daily Coastal Service (Soc. San Marco, Italy). The Yugoslavian Company, Jadranska Plovidba, runs North on Sundays and South on Fridays. A Weekly Mail Service runs from BRINDISI. In November, 1940, it has been reported that there is a regular service between VALONA and BARI and/or BRINDISI, three days per week by S.S. "FILIPPO," "GRIMANI," "BRIONI" and "BARLETTA," which make the passage by night.

Air

The Italian Air Line, Ala Littoria, operates a service to TIRANA, three times weekly

(9) Power Plants

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Air

The Italian Air Line, Ala Littoria, operates a service to TIRANA, three times weekly and a weekly round trip TIRANA-KORITZA-VALONA-TIRANA.

SASENO Island

Roads.—An excellent Motor Road has been constructed connecting all important points, with branches leading to the Battery positions, Wireless and Signal Stations.

Railways.—There is an Aerial Railway connecting the Harbour with the Main Barracks. An Underground Railway for transporting supplies and ammunition connects the Batteries and other positions.

(11) Signal Communications

VALONA

W/T.—There is a W/T Station at the Oil Depot, a quarter of a mile North of the Landing Pier. It has a low power H/F transmitter.

Cables.—There is no cable connection with SASENO Island, but the one between VALONA, OTRANTO and BRINDISI passes between SASENO and Cape LINGUETTA.

The cable runs into the sea at a point $1\frac{1}{2}$ miles North-West of the Port where there is a Cable House.

SASENO Island

Telephone.—The general defensive organisation of the Island appears to be connected up by Telephone.

V/S Stations.—There is a Visual Station situated on the summit of Mount SASENO, well camouflaged and of the most modern type.

W/T Stations.—There is a large W/T Station situated between the ridges in the centre of the Island, well camouflaged and of the most modern type, while another exists in the Harbour in SAN NICOLO Bay. The latter is reported to transmit weather bulletins and navigational warnings.

There is also a small W/T Station situated in the vicinity of No. 3 Battery.

(12) Defences

General Remarks

Since the absorption of ALBANIA by ITALY, the Italians have erected considerable Fortifications on the high ground above and around the Town of VALONA, and on the Peninsula which covers VALONA Bay. Full details of these Defences are not yet available. It can, however, be accepted that they include a number of guns of 11-in. and 6-in. calibre, about 20 A.A. guns, a number of machine-guns and eight searchlights. Two heavy guns have been located at KANINA, 2½ miles South-South-East from VALONA.

There is a Magazine which is sited a mile to the North-West of the Town. To the South there are several bomb-proof shelters with concrete facings, which are tunnelled in the cliffs. These latter were constructed during the War 1914-18.

(i) Sea Front Defences

(a) Coast Defence Batteries. (See inset, Plan 63.)

It is accepted that the Coast Defence batteries on SASENO Island are intended, in combination with a number of 12-in. guns mounted to the Southward of BRINDISI, to control the entrance into the ADRIATIC. (Note.—Batteries Nos. 1-9 are all on SASENO Island.)

No. 1 Battery.—Six guns of 4-7-in. calibre mounted on the Northernmost Point of the Island.

No. 2 Battery.—(?) Four guns of (?) 6-in. calibre mounted on the high ground to the Southward of No. 1 Battery.

No. 3 Battery.—(?) Four guns of (?) 4-in. calibre mounted, facing West, to the South-Westward of No. 2 Battery.

No. 3A Battery.—Two guns of 12-in. calibre mounted to the Northward of the Lighthouse.

No. 4 Battery.—(?) guns of (?) calibre mounted near the Signal Station.

No. 4A Battery.—One gun of 12-in. calibre mounted on the Western slopes of Hill 1087.

No. 5 Battery.—(?) guns of (?) calibre mounted on the Eastern slope of the ground to the South-Eastward of the Harbour.

No. 6 Battery.—(?) guns of (?) calibre mounted on the Eastern slope of the ground to the Eastward of Telemeter.

No. 6A Battery.—Two guns of 12-in. calibre mounted to the West of Telemeter near the summit of the hill.

No. 7 Battery.—Three guns of 12-in. calibre mounted on the high ground overlooking the bay, facing West, at the South end of the Island.

No. 8 Battery.—Four guns of 6-in. calibre situated on the Southernmost high ground of the Island, facing West; they are mounted in shields in a concrete emplacement; there is a concrete Blockhouse or Fort immediately above them.

Three of the guns have an arc of fire of approximately 150° to 320°, and the other one 70° to 150° and 30° to 320°. The fire control O.P. and four rangefinders are

Fortifications on the high ground above and around the Town of VALONA, and on the Peninsula which covers VALONA Bay. Full details of these Defences are not yet available. It can, however, be accepted that they include a number of guns of 11-in. and 6-in. calibre, about 20 A.A. guns, a number of machine-guns and eight searchlights. Two heavy guns have been located at KANINA, 2½ miles South-South-East from VALONA.

There is a Magazine which is sited a mile to the North-West of the Town. To the South there are several bomb-proof shelters with concrete facings, which are tunnelled in the cliffs. These latter were constructed during the War 1914-18.

(i) *Sea Front Defences*

(a) *Coast Defence Batteries.* (See inset, Plan 63.)

It is accepted that the Coast Defence batteries on SASENO Island are intended, in combination with a number of 12-in. guns mounted to the Southward of BRINDISI, to control the entrance into the ADRIATIC. (Note.—Batteries Nos. 1-9 are all on SASENO Island.)

No. 1 Battery.—Six guns of 4.7-in. calibre mounted on the Northernmost Point of the Island.

No. 2 Battery.—(?) Four guns of (?) 6-in. calibre mounted on the high ground to the Southward of No. 1 Battery.

No. 3 Battery.—(?) Four guns of (?) 4-in. calibre mounted, facing West, to the South-Westward of No. 2 Battery.

No. 3A Battery.—Two guns of 12-in. calibre mounted to the Northward of the Lighthouse.

No. 4 Battery.—(?) guns of (?) calibre mounted near the Signal Station.

No. 4A Battery.—One gun of 12-in. calibre mounted on the Western slopes of Hill 1087.

No. 5 Battery.—(?) guns of (?) calibre mounted on the Eastern slope of the ground to the South-Eastward of the Harbour.

No. 6 Battery.—(?) guns of (?) calibre mounted on the Eastern slope of the ground to the Eastward of Telemeter.

No. 6A Battery.—Two guns of 12-in. calibre mounted to the West of Telemeter near the summit of the hill.

No. 7 Battery.—Three guns of 12-in. calibre mounted on the high ground overlooking the bay, facing West, at the South end of the Island.

No. 8 Battery.—Four guns of 6-in. calibre situated on the Southernmost high ground of the Island, facing West; they are mounted in shields in a concrete emplacement; there is a concrete Blockhouse or Fort immediately above them.

Three of the guns have an arc of fire of approximately 150° to 320°, and the other one 70° to 150° and 200° to 320°. The fire control O.P. and four rangefinders are above the Blockhouse. The guns and Blockhouse are heavily wired in and there are M/G Posts to defend the position.

No. 9 Battery.—Four guns of 6-in. calibre mounted in shields in steps down the ridge and facing South; arc of fire 110° through South to 320°.

A fire control position appears to be situated in the centre of the battery, and there are rangefinders in concrete shelters below each battery.

No wire defences are visible, but several M/G posts exist.

No. 10 Battery.—M. ACROCERAUNI above C. LINGUETTA: Four guns of 4.7-in. calibre.

No. 10A Battery.—C. LINGUETTA: visible from the sea, (?) guns of (?) calibre.

No. 10B Battery.—KARABOURNU PENINSULA: distributed along the high ground—eight guns of (?) calibre (heavy). These guns are mounted in turrets.

No. 11 Battery.—TREPOTI: Six guns, three of which are of 4.7-in. calibre.

No. 12 Battery.—PANAJA: (?) guns of (?) calibre.

(g) Magazines

Shell and bomb-proof accommodation of ferro-concrete construction is provided for troops whilst ammunition is stored in Underground Magazines.

There are Ammunition Dumps on M. ACROCERAUNI above C. LINGUETTA, at PANAJA, 1½ miles North of VALONA, and at NISVORO, 9 miles South of VALONA.

*(ii) Movable Armament**VALONA*

Eight Field guns have been reported near the Aerodrome and a number of others have been landed.

(iii) Searchlights

Searchlights are mounted on the Island.

Rangefinders

A telemeter is situated 350 yards East of SASENO Lighthouse and another on the summit of Hill 1015 (the more southerly of the two main peaks). An instrument, which is possibly a rangefinder, was seen in 1928 to the North of the small barracks East-North-East of SASENO Lighthouse.

On the southern peak there are four rangefinders, two with very long base and two shorter. To the South of Battery No. 8 there is another rangefinder.

*(iv) Local Seaward Defences**Minefields*

The entrances to VALONA Bay, both North and South of SASENO Island, have been mined, as well as the Western coast of the Island.

Torpedo Batteries

There is a battery of three double torpedo tubes facing West.

Booms and A/S Nets

The harbours of both VALONA and SASENO Islands are defended by booms. An unconfirmed report states that there is a boom in position between SASENO Island and Cape LINGUETTA.

*(v) Local Air Defences**Anti-Aircraft Batteries*

A.A. Battery No. 1.—SASENO Island: Eight A.A. guns of (?) 3-in. calibre mounted in pairs.

A.A. Battery No. 2.—C. LINGUETTA: Four A.A. guns of 3-in. calibre.

A.A. Battery No. 3.—NISVORO: At a bridge over the river, two A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 4.—KRIONERO: (?) four A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 5.—VALONA: (?) twelve A.A. guns, of (?) 3-in. calibre.

A.A. Battery No. 6.—TOFHANA: four A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 7.—PANAJA: two A.A. guns, of (?) 3-in. calibre.

A.A. Battery No. 8.—TREPOTI: four A.A. guns of (?) 3-in. calibre.

Anti-Aircraft Close Defence

ACROCERAUNI Eight A.A. Machine Guns of 0.8-in. calibre.

Range finders

A telemeter is situated 350 yards East of SASENO Lighthouse and another on the summit of Hill 1015 (the more southerly of the two main peaks). An instrument, which is possibly a range finder, was seen in 1928 to the North of the small barracks East-North-East of SASENO Lighthouse.

On the southern peak there are four range finders, two with very long base and two shorter. To the South of Battery No. 8 there is another range finder.

(iv) Local Seaward Defences

Minefields

The entrances to VALONA Bay, both North and South of SASENO Island, have been mined, as well as the Western coast of the Island.

Torpedo Batteries

There is a battery of three double torpedo tubes facing West.

Booms and A/S Nets

The harbours of both VALONA and SASENO Islands are defended by booms. An unconfirmed report states that there is a boom in position between SASENO Island and Cape LINGUETTA.

(v) Local Air Defences

Anti-Aircraft Batteries

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A.A. Battery No. 2.—C. LINGUETTA: Four A.A. guns of 3-in. calibre.

A.A. Battery No. 3.—NISVORO: At a bridge over the river, two A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 4.—KRIONERO: (?) four A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 5.—VALONA: (?) twelve A.A. guns, of (?) 3-in. calibre.

A.A. Battery No. 6.—TOFHANA: four A.A. guns of (?) 3-in. calibre.

A.A. Battery No. 7.—PANAJA: two A.A. guns, of (?) 3-in. calibre.

A.A. Battery No. 8.—TREPORTI: four A.A. guns of (?) 3-in. calibre.

Anti-Aircraft Close Defence

ACROCERAUNI Eight A.A. Machine Guns of 0.8-in. calibre.

TREPORTI Three A.A. Machine Guns of 0.8-in. calibre.

NISVORO Two A.A. Machine Guns of 0.8-in. calibre.

A further thirty A.A. Machine Guns of 0.8-in. calibre are distributed as follows:—

NISVORO, KRIONERO, VALONA, TOPANA, PANAGIA, KUSBABA and ARTA
Seaplane Station.

Mobile Anti-Aircraft Defences

There is a mobile group of twelve A.A. guns of (?) 3-in. calibre, for positioning as required.

(viii) Garrison

SASENO Island.—The Naval and Military personnel were last reported as estimated at about 1,400. The addition of the 12-in. guns, torpedo tubes, searchlights, and other equipment will, no doubt, have made considerable increases necessary.

VALONA 91

(13) Reconnaissance. (See Admiralty Chart No. 1589.)

VALONA

(a) *Suitability for Landing Troops.*—Landing is possible in the vicinity of the Skala from Cape TREPOTI to PELASGIA Point. The beach is sandy, and rise and fall of tide small. South of PELASGIA Point the coast is broken up into small rocky bays.

(b) *Forming up Places.*—Adequate space North-West of the Skala, but becomes limited in depth to the South-East owing to the rising ground.

(c) *Exposure of Beach to Hostile Fire.*—The whole beach is exposed to hostile fire from the hills, which run parallel to the shore, and guns of 11-in. or 9.5-in. calibre have been mounted on KARABOURNU Peninsula along the coast and at C. LINGUETTA.

(d) *Dead Ground.*—There is little or no dead ground.

(e) *Enemy Defensive Positions.*—Defensive positions on the hills mentioned in sub-para. (3) would most likely be occupied.

(f) *Inter-communication.*—North-West of the SKALA there is no road, and in wet weather the ground would be heavy, making inter-communication difficult. To the South-East of the Skala a road runs along the beach and inter-communication would be excellent.

(g) *Exits.*—Exits exist throughout the whole length of the area.
Cape TREPOTI-PELASGIA Point. Few exits exist immediately South of PELASGIA Point.

(h) *Covering Positions.*—Covering positions would have to be established on the hills already mentioned.

(i) *Camp Sites.*—These exist throughout the whole length of the area.

(j) *Fuel and Water.*—Timber is available and water is obtained from wells.

There is a spring called "Good Water" near PELASGIA Point. Water is brought from there in 200-gallon tanks on a horse-drawn truck on the light railway.

(k) *Emergency Landing Grounds.*—An Emergency Landing Ground could be established to the West of the SKALA-VALONA Road.

(l) *Objectives.*—The high ground about Hill 1245, which is easily distinguished by the Ruined Fort on the skyline at the summit, would make a suitable first objective for a force intending eventually to occupy the KANINA Ridge as a covering position for a subsequent landing at Port SKALA. There are two approaches from a direction West by South by two well-defined valleys. The "going" is rough in places, but there is plenty of cover—the Southernmost valley is probably the easier. Extensive but fairly open olive groves at the Western extremities of both valleys would assist the advance in the early stages, and also be of use for forming up small units under cover. The Coast Road and the Aerodrome might well become available for this purpose with larger units at a later stage. Apart from the existence of the derelict fort, the presence of obsolete and rusty barbed wire in considerable quantities and in likely places makes it probable that the vulnerability of the KANINA ridge to attack from this direction has already been appreciated. The conformation of the ground is such that the progress of the assaulting infantry could be observed and covered by ships' guns and by machine guns.

(e) *Enemy Defensive Positions.*—Defensive positions on the hills mentioned in sub-para. (3) would most likely be occupied.

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There is a spring called "Good Water" near PELASGIA Point. Water is brought from there in 200-gallon tanks on a horse-drawn truck on the light railway.

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These might be minimised by picketing the high ground in the immediate neighbourhood of the forming-up places, prior to the main advance. Against snipers in this type of country, neither guns nor machine-guns would be of much avail.

SASENO Island

The coast line on the North, West and South is rocky. On the Eastern side of the Island a small stretch of sand runs between the water's edge and the land.

Landing Places.—There is a small landing place on the West side of SASENO Island. Troops (one boat at a time) could be landed here in calm weather.

THE DODECANESE ISLANDS—GENERAL

(See Plan S1)

(1) General Remarks

The topography of the principal Islands is given in Section IV.

RHODES, LERO and STAMPALIA are the most important Islands of the DODECANESE and they are heavily defended. All the Islands in the Group are described individually in the following pages.

Population.	Greeks.	Turks.	Jews.	Italians.	Total Population
RHODES (including town)	40,000	2,200	1,800	12,000	56,000
RHODES (town)	21,000	2,000	1,800	10,000	35,000
KOS	8,000	500	500	1,000	10,000
SYMI	3,500	Nil	Nil	Nil	3,500
KHALKIA	500	Nil	Nil	Nil	500
TILO	1,500	Nil	Nil	Nil	1,500
KASTELORIZO	700	Nil	Nil	Nil	700
STAMPALIA	2,000	Nil	Nil	Nil	2,000
SCARPANTO	8,000	Nil	Nil	Nil	8,000
KASO	2,500	Nil	Nil	Nil	2,500
KALIMNO	8,000	Nil	Nil	Nil	8,000
PATMOS	2,000	Nil	Nil	Nil	2,000
NISERO	2,500	Nil	Nil	Nil	2,500
LEROS	3,000	Nil	Nil	1,000	4,000
OTHER ISLANDS	500	Nil	Nil	Nil	500

It is probable that the emigration which has taken place during the past 10 years has reduced the population of all creeds by 30 to 40 thousand.

Provisions

Provisions are sent monthly from RHODES for the civilian population of other islands. The "FIUME," 250-300 tons, makes a weekly voyage carrying mails between RHODES, PISCOPI, NISERO, LERO, KALIMNO, KOS and PATMOS.

(4) Government Establishments

The Governor of the DODECANESE resides in RHODES.

(12) Defences

(ii) Mobile Artillery

Population	Greeks	Turks	Jews	Italians	Total Population
RHODES (including town)	40,000	2,200	1,800	12,000	56,000
RHODES (town)	21,000	2,000	1,800	10,000	35,000
KOS	8,000	500	500	1,000	10,000
SYMI	3,500	Nil	Nil	Nil	3,500
KHALKIA	500	Nil	Nil	Nil	500
TILO	1,500	Nil	Nil	Nil	1,500
KASTELORIZO	700	Nil	Nil	Nil	700
STAMPALIA	2,000	Nil	Nil	Nil	2,000
SCARPANTO	8,000	Nil	Nil	Nil	8,000
KASO	2,500	Nil	Nil	Nil	2,500
KALIMNO	8,000	Nil	Nil	Nil	8,000
PATMOS	2,000	Nil	Nil	Nil	2,000
NISERO	2,500	Nil	Nil	Nil	2,500
LEROS	3,000	Nil	Nil	1,000	4,000
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It is probable that the emigration which has taken place during the past 10 years has reduced the population of all creeds by 30 to 40 thousand.

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(4) Government Establishments

The Governor of the DODECANESE resides in RHODES.

(12) Defences

(ii) Mobile Artillery

The only artillery known to be mobile in the DODECANESE are the nine 12-gun batteries of the artillery of 50th Division. Except one battery on KOS, all of these are believed to be on RHODES, but the identifications are very old.

A further 35 batteries have been identified in the Group. These should have 12 guns each, but those with heavier guns may have only eight. How many are employed in a mobile role, or with static coast defence guns, or how they are distributed among the islands, is not known.

(viii) Garrison

On 1st September, 1942, the total number of troops stationed in the DODECANESE Islands was estimated to be between 44,000 and 45,000, including Marines manning the Coast Defences and Black Shirt Militia, but excluding Air Force personnel. In the absence of up-to-date information on all the Islands, this estimate should be accepted with reserve.

DODECANESE ISLANDS 93

The following figures of Garrisons on the individual Islands indicate their relative importance:—

<i>Estimated Garrison Strength in the DODECANESE Islands</i>			
			Reported evacuated
ARCHI ..	..	..	..
GAIDARO ..	..	..	..
KALIMNO ..	..	..	4
KASTELORIZO ..	..	..	..
KHALKIA (including ALIMNIA and small adjacent Islands) ..	..	..	..
KOS ..	..	..	250
LERO ..	..	..	150
LIPSO ..	..	..	4,000
NISERO (including YALI, KANDELIUSA and small adjacent Island) ..	..	..	6,000
PATMOS ..	..	..	50
PISCOPI ..	..	..	100
RHODES ..	..	..	300
SCARPANTO (including SARIA and KASO) ..	..	..	150
SIMI ..	..	..	27,000
STAMPALIA ..	..	..	3,500
			1,000
			1,000
TOTAL (say) ..			44,500

ARCHI

(Lat. 37° 23' N., Long. 26° 44' E.)

(See Plan 97.)

Reports marked * are of doubtful reliability.

(1) General Remarks

ARCHI is situated North of LIPSO. It is a small Island, 3 miles in length and about 1½ miles wide, with minor defences only. A mountain ridge runs North to South through half of the Island.

The inhabitants have been evacuated.

(3) The Town

The village S. NICOLA lies on a North-West spur of GUARDIA, with landing place in Porto AUGUSTA to South-West, and an open cove to North-East.

(4) Government Establishments

Barracks

Two Barracks are under construction : one of them is at CAMPO.

Lighthouse

*There is a lighthouse in the vicinity of ARCHI.

(11) Signal Communications

W/T Station

A W/T Station has been established, about 1½ miles to the south of the northern shore. It is probable that this is for intercommunication with the neighbouring Islands.

Cables and Telephone

ARCHI is connected with LERO by cable and with PATMOS by cable and telephone.

(12) Defences

(i) Sea Front Defences

(a) *Coast Defence Batteries*.—Batteries have been established on the Island, and they are camouflaged : their position and the calibre of the guns are not known.

(e) *Local Defences*.—Wire entanglements. *No details of the wiring of the beaches of the Island are known, but this is reported to have been done.

(g) *Magazines*.—There is an ammunition store which is situated near the Barracks at CAMPO.

Observation Posts.—There are Observation Posts at the north-west end of the mountain in the northern half of the Island and on C. ALMIRIDA.

(iii) Searchlight

There is a searchlight on the extreme northern point of the Island, at C. KOMORO.

(v) Local Air Defences

There is an Aircraft Listening Post with W/T on the Island, position not known.

(viii) Garrison

Reported evacuated.

(13) Reconnaissance

(4) Government Establishments

Barracks

Two Barracks are under construction : one of them is at CAMPO.

Lighthouse

*There is a lighthouse in the vicinity of ARCHI.

(11) Signal Communications

W/T Station

A W/T Station has been established, about 14 miles to the south of the northern shore. It is probable that this is for intercommunication with the neighbouring Islands.

Cables and Telephone

ARCHI is connected with LERO by cable and with PATMOS by cable and telephone.

(12) Defences

(i) *Sea Front Defences*

(a) *Coast Defence Batteries*.—Batteries have been established on the Island, and they are camouflaged : their position and the calibre of the guns are not known.

(e) *Local Defences*.—Wire entanglements. *No details of the wiring of the beaches of the Island are known, but this is reported to have been done.

(g) *Magazines*.—There is an ammunition store which is situated near the Barracks at CAMPO.

Observation Posts.—There are Observation Posts at the north-west end of the mountain in the northern half of the Island and on C. ALMIRIDA.

(iii) *Searchlight*

There is a searchlight on the extreme northern point of the Island, at C. KOMORO.

(v) *Local Air Defences*

There is an Aircraft Listening Post with W/T on the Island, position not known.

(viii) *Garrison*

Reported evacuated.

(13) Reconnaissance

ARCHI Island consists of :—

(1) An irregular ridge running from M. TESTA-BIANCA, 340 ft., at the north-west end, to M. GUARDIA in the south-east, of which a spur forms C. LERO, 340 ft. The highest point is M. CALATO, 350 ft., which forms the precipitous Cape CALARACI on the west coast, with coves SICIA to the north-west and CALAMICI to the south-east, which give shelter from north and east winds. SICIA has access inland.

(2) Broken and half-submerged hill country to the south-west of the main ridge, dissected by three deep inlets, P. AUGUSTA, P. STRETTO, GLIPAPA Cove and prolonged seaward into many islets to south-west and south-east. Of these the largest, GRILUSSA, and MARATI, are inhabited, and GRILUSSA has a deep inlet facing north-west.

Between GLIPAPA and BAMBIGA Bays there is low cultivable land, with a beach 200 yards long to south-east. The rest of the island is pasture, divided by dry stone walls into grazing grounds with sheep folds.

CASTELROSSO (KASTELORIZO) 95

CASTELROSSO (KASTELORIZO)

(Lat. 36° 08' N., Long. 29° 38' E.)

Reports marked * are of doubtful reliability.

(1) General Remarks

CASTELROSSO Island, situated about 70 miles East by South from the Northern point of RHODES, and 1½ miles from the coast of TURKEY, was occupied by the French in the war of 1914-1918, and handed over to the Italians by the TREATY OF SEVRES in 1921. It is 3½ miles long by 1½ miles wide, and consists of a rugged limestone tableland, which has an irregular surface and a general altitude of about 350 feet. Much of it rises above this, and the highest point is 889 feet. The population, which is Greek, numbers about 700.

(2) Port Facilities

(a) CASTELROSSO Harbour: On the North-Eastern side of the Island, situated at the head of a bight extending nearly a mile South-Westward. It has a width of about 1 cable, with depths of from 4 to 7 fathoms. Small vessels entering the harbour anchor near the entrance and secure stern-to buoys.

Quay: A quay to which boats and lighters may secure runs along the Southern and Eastern shores of the Harbour: Depth alongside, 3 to 9 feet.

(b) MANDRACCHIO Harbour: Situated close Eastward of CASTELROSSO Harbour. The water around the shore is very shallow, but the small islands off the entrance form a well-sheltered roadstead where large vessels can anchor close to the town in 6 to 10 fathoms, sand and mud.

Harbour Craft

One tug.
Several lighters.

Buoys

Buoys are moored along the Eastern shore of CASTELROSSO Harbour.

Submarines

An important base for Submarines has for some time been reported under construction by the Quay in CASTELROSSO Harbour, but no information of its completion and use has been received.

(3) The Town

CASTELROSSO Town is built around the Southern and Eastern sides of the Harbour.

(a) Supplies.

Provisions are imported from the Mainland.

(b) Water.

There are no springs on the Island, and water for aircraft and ships is therefore difficult to obtain.

Rain is stored in Reservoirs in the following places:—

- * (a) M. PIZZICA.
- * (b) M. MUNDA, in the crater at the top of the hill.
- * (c) S. TRINITA, in cylindrical tanks in a row at the foot of the mill.
- * (d) S. ELIA: near the Monastery.

(4) Government Establishments

Barracks

These are in red buildings on both sides of the entrance to CASTELROSSO Harbour.

entrance and secure stern-to buoys.

Quay: A quay to which boats and lighters may secure runs along the Southern and Eastern shores of the Harbour: Depth alongside, 3 to 9 feet.

(b) MANDRACCHIO Harbour: Situated close Eastward of CASTELROSSO Harbour. The water around the shore is very shallow, but the small islands off the entrance form a well-sheltered roadstead where large vessels can anchor close to the town in 6 to 10 fathoms, sand and mud.

Harbour Craft

One tug.
Several lighters.

Buoys

Buoys are moored along the Eastern shore of CASTELROSSO Harbour.

Submarines

An important base for Submarines has for some time been reported under construction by the Quay in CASTELROSSO Harbour, but no information of its completion and use has been received.

(3) **The Town**

CASTELROSSO Town is built around the Southern and Eastern sides of the Harbour.

(a) *Supplies.*

Provisions are imported from the Mainland.

(b) *Water.*

There are no springs on the Island, and water for aircraft and ships is therefore difficult to obtain.

Rain is stored in Reservoirs in the following places:—

- * (a) M. PIZICA.
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- * (c) S. TRINITA, in cylindrical tanks in a row at the foot of the hill.
- * (d) S. ELIA: near the Monastery.

(4) **Government Establishments**

Barracks

These are in red buildings on both sides of the entrance to CASTELROSSO Harbour.

Fuel

Petrol is stored:—

- (a) in the Southern part of Cape S. STEFAN, probably near the stone quarries, underground.
- (b) On the shore of MANDRACCHIO Harbour; a small store, probably in barrels or tins, for the Seaplane Base.

(7) **Air Facilities**

Seaplane Base.

(a) The Main Seaplane Base is established at the head of the bight in CASTELROSSO Harbour, where there are Hangars and Workshops. Fuel and oil are available.

(b) There is a secondary Seaplane Base in MANDRACCHIO Harbour. *A tunnel at NIFTI Point is accessible only from the sea and is used as a Hangar.

Prior to the present War, CASTELROSSO was used as a stopping place for Air FRANCE Flying Boats on the FRANCE-INDO-CHINA route.

96 CASTELROSSO (KASTELORIZO)

(10) Transport Facilities

Sea

There is regular steamer communication with RHODES.

Rail

A light railway runs from CASTELROSSO to Cape S. STEFANO.

Roads

There is a carriage road through CASTELROSSO Town, linking NIFTI Point with Cape S. STEFANO on the North-East of the Island. Another road leads from the Town to PALEOCASTRO in the West.

(11) Signal Communications

W/T Stations

- (a) Main Station : on the Northern point of CASTELROSSO Harbour.
- (b) Military Station : in the crater on the top of M. PITZICA.
- (c) M. KATOPHLI : Southern part of the Island.
- (d) Reserve Set : S. ELIA Monastery.

V/S Stations

Cape S. STEFANO : on the Northern and Southern points.

Telegraph

The Island is linked by cable to the Mainland.

Telephone

The telephone is installed in the town.

(12) Defences

Most of the Defences of CASTELROSSO are placed on the North-East side, presumably as a protection against attack from the Mainland.

(i) *Sea Front Defences*

(a) *Coast Defence Batteries*

- Battery No. 1 : CAPE S. STEFANO, Northern Point—? guns of 3.9-in. calibre. E.D.B.2.1941.
- Battery No. 2 : CAPE S. STEFANO, Southern Point—(?) guns of 3.9-in. calibre. E.D.B.2.1941.
- Battery No. 3 : PSORADIA Island—(?) guns of (?) calibre. E.D.B.2.1941.
- Battery No. 4 : Old Fortress, CASTELROSSO—(?) guns of (?) calibre. E.D.B.2.1941.
- Battery No. 5 : S. GIORGIO Island—1 gun of 11-in. calibre. E.D.B.2.1941.
- Battery No. 6 : NIFTI Point—(?) guns of (?) 6-in. calibre. E.D.B.2.1941.
- Battery No. 7 : M. VICLA—(?) guns of (?) 6-in. calibre. E.D.B.2.1941.
- Battery No. 8 : M. PALEOCASTRO—(?) guns of 6-in. calibre. E.D.B.2.1941.

In view of the small garrison stated to be on this Island it is considered that many of the guns mentioned in this report have either been abandoned or removed.

(c) *Local Defences*

Observation Posts

There is an Observation Post on M. VICLA.

Magazines

(a) Main Station: on the Northern point of CASTELROSSO near M.

(b) Military Station: in the crater on the top of M. PITZICA.

(c) M. KATOPHLI: Southern part of the Island.

(d) Reserve Set: S. ELIA Monastery.

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In view of the small garrison stated to be on this Island it is considered that many of the guns mentioned in this report have either been abandoned or removed.

(c) Local Defences

Observation Posts

There is an Observation Post on M. VICLA.

Magazines

There is a Munitions Depot in a small Monastery near M. PALEOCASTRO Fort.

(iii) Searchlights

There are Searchlights on the walls of the Old Fortress of CASTELROSSO.

(v) Local Air Defences

Large calibre A.A. guns were unloaded in November, 1939, and the following are mounted:—

(a) A.A. Batteries

*Battery No. 1: Old Fortress, CASTELROSSO Town—(?) guns of (?) calibre. E.D.P. D.C.3: 1941.

*Battery No. 2: M. VICLA—(?) guns of (?) calibre. E.D.: P.D.: C.3: 1941.

(viii) Garrison

*This consists of about 250 men.

CASTELROSSO (KASTELORIZO)

GAIDARO

97

(13) Reconnaissance

The Island of CASTELROSSO is dissected by

- (a) A valley running north-east into the CASTELROSSO Harbour.
- (b) A short, narrow and deep valley running to NAVACLA COVE on the south-east coast.
- (c) A small valley running south-west to the coast near Cape PONENTE in the south-west of the island.

NIFTI Point. This is a good landing place unless a strong east wind is blowing.

South of NIFTI Point there is a small rocky Bay, 230° NIFTI Point 0.8', but landing would be difficult, and there is only a single file zigzag path over the high ridge of hill.

West coast: There is a small bay at the end of the valley west of the town, where the beach consists of rocks and boulders, which would make landing difficult in the dark, and it might be dangerous in a strong west wind.

GAIDARO

(Lat. 37° N., Long. 26° 58' E.)

(See Plan 97.)

Reports marked * are of doubtful reliability.

(1) General Remarks

GAIDARO Island, which is claimed by the Italians, lies South of SAMIOS and N.E. of ARCHI, and is approximately equidistant (10 miles) from them both. The Island is 4 miles long; it is indented with bays and inlets, and is divided by a ridge of hills which reaches only 720 ft. at the highest point.

* The inhabitants have been evacuated.

(2) Port Facilities

The Bays which occur on the coast line are suitable only for small vessels in their inner corners, and with suitable winds. Account must be taken of the dangers of rocks and reefs between GAIDARO and the nearby islets of CLARO, NERO and STRONGILO.

(3) The Town

The village of CORIO is on the ridge between M. CASTELLO and M. GUARDIA, overlooking Porto S. GIORGIO. There are a few houses also ½ mile further West, on a similar ridge North of M. VEDETTA.

Water Supply

Water and supplies are brought from LERO.

(11) Signal Communications

W/T

There is a W/T Station in the centre of the Island, at CORIO.

(12) Defences

(i) *Sea Front Defences*

(a) *Coast Defence Batteries*

E.D. P.D. No. 1 Battery. S.W. of Island, pointing towards ARCHI. Three or four guns of (?) calibre.

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The Bays which occur on the coast line are suitable only for small vessels in their inner corners, and with suitable winds. Account must be taken of the dangers of rocks and reefs between GAIDARO and the nearby islets of CLARO, NERO and STRONGILO.

(3) The Town

The village of CORIO is on the ridge between M. CASTELLO and M. GUARDIA, overlooking Porto S. GIORGIO. There are a few houses also $\frac{1}{2}$ mile further West, on a similar ridge North of M. VEDETTA.

Water Supply

Water and supplies are brought from LERO.

(11) Signal Communications

W/T

There is a W/T Station in the centre of the Island, at CORIO.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

E.D. P.D. No. 1 Battery. S.W. of Island, pointing towards ARCHI. Three or four guns of (?) calibre.

E.D. P.D. No. 2 Battery. S.E. of Island, pointing towards the ASIATIC Coast. Three or four guns of (?) calibre.

(g) *Magazines*.—Ammunition is kept in a Church at PANAGIA. *Fifteen other buildings are said to have been evacuated for storage of war material.

Observation Posts.—There are two Observation Posts on the Island.

(iii) Searchlights

There is a searchlight on the point of the tongue of land which extends Westward from the reef joining the Island with NERO.

(iv) Local Seaward Defences

Minefields.—Mines have been laid between GAIDARO and PATMOS.

(viii) Garrison

The Island garrison is reported to be 4 Carabinieri.

(C46735)

GAIDARO
98 KALIMNO

(13) Reconnaissance

GAIDARO is a low, irregular mass of hard limestones and schists, with a main watershed from East to West, rising to 620 ft. near the West coast, and sinking into long spurs and islets to North-East; and a detached hill, M. ACERBO, to South-West.

The North coast is steep at the West end, but less abrupt round Porto MAESTRO and Porto CATTOLICO to North-East, where there are anchorages and landing places among the rocks. The west coast is more indented, but all rocky and steep-to. On the South coast three deep valleys converge on a deep bay, with landing places. The deep inlet PORO further East is rocky and without access to the interior.

The population, which is Greek, came from PATMOS in recent times. The whole island is covered with evergreen scrub, and is pasture. There is some export of sheep, goats and cheese, in exchange for other foodstuffs. The small islands to the North, PLATTA and STRONGILO, and to the South, CONIGH, are grazed in summer.

KALIMNO

(Lat. 36° 57' N., Long. 27° 01' E.)
(See Plans 90 and 91.)

(1) General Remarks

The Island is mountainous with a central ridge with two peaks. Mount PARASIVA is 2,250 ft. and there is another peak a quarter of a mile south-eastward, 2,000 ft. high, from which a peninsular ridge extends about 6½ miles north-westward. The coast is rugged with various inlets and bays.

The Island is not fertile, but it produces figs, wine, barley, oil and honey.

The population is 8,000.

(2) Port Facilities

Port KALIMNO, situated at the head of a bight at the south-east end of the Island, is a semi-circular bay about 4 cables wide, shallow, protected on the south side by a small mole, inside which small vessels may find shelter. There are 15 small vessels, owned by the inhabitants, of capacity 50-140 tons each. These are two-masted sailing craft; some of them have auxiliary motors.

The Naval Harbour is situated in the bight of POTHIA, which is a suburb of Port KALIMNO, about ½ mile to the eastward.

Submarines also use the anchorages in ARGANO Bay and Port VATI.

There is a small dock at POTHIA, located immediately in front of the Customs House.

(3) The Town

The principal town in the Island is Port KALIMNO where the majority of the inhabitants live. They are reputed to hate the Italians and would welcome deliverance.

(4) Government Establishments

The Governor's House is in front of the cathedral. In it are the court room and the offices of the Governor, police and civil authorities. In the same building, at the eastern end, are the post and telegraph offices.

Military headquarters are at POTHIA, on the upper floor of Sevasto and Economos's building.

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The Naval Harbour is situated in the bight of POTHIA, which is a suburb of Port KALIMNO, about ¼ mile to the eastward.

Submarines also use the anchorages in ARGANO Bay and Port VATI.

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Military headquarters are at POTHIA, on the upper floor of Sevasto and Economos's building.

Barracks

Barracks exist as follows:—

- (a) In the Customs House, below the Church of St. Nicholas near the roof of the breakwater: here there is a small garrison.
- (b) On the CORDONI Jetty: barracks housing military and gendarmerie.
- (c) VOUVALI Nautical School, facing the eastern end of Government House.
- (d) By the VOUVALI Hospital: barracks.
- (e) At the point "CHRISTOS IERUSALEM," beyond the two cemeteries: artillery headquarters.
- (f) On the road between the Pharmacy Square and the centre of the town, 50 yards from the Square: the central gendarmerie barracks and telephone exchange.
- (g) About 50 yards towards the Port from the Church of St. John Theologos: a second gendarmerie barracks.
- (h) About ¾ mile up the branch road from the VOUVALI Hospital, HORA main road: the HORA police station.

KALIMNO 99

- (i) In a building on the coastal road south of the Customs House : an officers' quarters, with an army provision store below.
- (j) Port VATI : a warehouse on the shore is used as a barracks.
- (k) POTHIA : wooden barracks sited on the south-west of the inlet near the water front : accommodation for 150 men : private houses have also been requisitioned.
- (l) Port KALIMNO : at the western end of the town there is a hospital now used as barracks for 200-300 men.
- (m) CORIO : in a pass between two hills near the village of CORIA : for artillery personnel.
- (n) ARGHINONDA : private houses requisitioned as barracks : about 100 men.
- (o) SCALIA : private houses requisitioned as barracks : about 100 men.
- (p) BORIO : private houses requisitioned as barracks : about 100 men.
- (q) DASSO : barracks in the centre of the valley.
- (r) MIRTIES : on the west coast : barracks.
- (s) Point CAZZUNI : summer camps around the bay.
- (t) Artillery shell store, 20 yards : artillery encampment below the artillery headquarters.

Victualling Stores

These are kept in the VOUVALI Nautical School, which is opposite the post office in Port KALIMNO.

"Xeropighado," immediately after the big bridge, a newly constructed army fodder storehouse.

Hospital

The VOUVALI Hospital is on the ANASTASSI HORA road which leads from the right of the Pharmacy square.

Fuel Storage

The first building on the starboard bank when entering the harbour of Port KALIMNO, is a benzine depot. There is a fuel depot near VOUVALI Monastery. The oil depots of the municipality are on the south side of the harbour. In Port VATI there is an oil fuel depot, where oil is stored in drums.

(7) Air Facilities

An aerodrome is under construction. This is variously reported as—

- (a) Facing TELENDO Channel.
 - (b) North-north-west of Mount PROFETA ELIA.
 - (c) South-south-west of Mount PROFETA ELIA and south-south-east of CORIO.
- (c) is the most probable site : it is connected by good roads to Port KALIMNO and POTHIA.

(9) Power Plants

There is a small power plant situated about 220 yards north of the two main buildings in POTHIA.

(10) Transport Facilities

Road

There is a good motor road connecting Port KALIMNO with LINARIA and MIRTIES.

(5) Point CAZZUNI : summer camps around the bay.

(4) Artillery shell store, 20 yards : artillery encampment below the artillery headquarters.

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(9) Power Plants

There is a small power plant situated about 220 yards north of the two main buildings in POTHIA.

(10) Transport Facilities

Road

There is a good motor road connecting Port KALIMNO with LINARIA and MIRTIES. Another good road leads from Port VATI to DASSO.

Sea

See RHODES and LERO.

(11) Signal Communications

W/T

There is reason to believe that there is inter-communication between all fortified islands by W/T.

Telephone

There is a telephone from the O.P. on Mount PROFETA ELIA to LERO.

Telegraph

There is a telegraphic communication with LERO, KOS and LEMNOS Islands.

(C46758)

KALIMNO 101*(g) Magazines and Munitions Stores*

- (1) Near VOUVALI barracks, south and east of 3 windmills below the barracks. This is the central ammunition store with over 100 tons of ammunition; it is 6,500 square ft. in area and is protected on the south, east and west by a triple row of barbed wire entanglements.
- (2) EPTA PARTHENES, in an old quarry just outside the town of Port KALIMNO; ammunition.
- (3) Under the house of Dr. Calvares, opposite a petrol store; hand grenades.
- (4) Port KALIMNO; torpedoes.
- (5) Downhill from the artillery headquarters, in a bungalow; artillery shells.
- (6) VOUVALI Nautical School, in the extreme north-east end; military stores.
- (7) Under the ROMA Cinema, on the CHRISTOS Road, 500 yards from the VOUVALI Nautical School; military stores.
- (8) Opposite barracks at POTHIA in a large house without a roof there is 1 room which is an ammunition store.
- (9) On Mount PROFETA ELIA; an ammunition depot.
- (10) CORIO, near the barracks; a small ammunition depot.
- (11) DASSO, probably near the barracks; an ammunition depot.
- (12) PEZONDA, in the O.P.; ammunition stores.
- (13) Monastery or church of ANASTASI; ammunition stores.
- (14) MOURALIA, on the south side of VATI Bay; ammunition stores.
- (15) CAZZUNI, in a small storehouse; ammunition stores.
- (16) SISTERNI, near the O.P., in a tunnel; ammunition dump.
- (17) AGHIOS PETROS, in a church on a hill, south of Port KALIMNO; ammunition stores.
- (18) Port KALIMNO slaughterhouse, below the road; an ammunition store.
- (19) KARAVIA, near AGHIOS GIORGIOS, near a machine gun post in a store hut; ammunition store.
- (20) TRACHILES, in the O.P. in a small house; ammunition stores.

Observation Posts

- (1) At the summit of Mount PROFETA ELIA; defended.
- (2) M. CHIRASSILI, about 1 mile due north of VATI; defended with 1 machine gun.
- (3) ROMNIS, north-west of and near VATI; defended with 1 machine gun.
- (4) MOURALIA, on the south shore of VATI Bay; defended with 1 machine gun.
- (5) CAZZUNI, south of VATI, in a small stone house; defended with 1 machine gun and 1 mortar.
- (6) SISTERNI, north-east of and near POTHIA; defended.
- (7) THERMO, south of POTHIA; defended with 1 machine gun.
- (8) PEZOULES, adjoining C. AGHIOS GIORGIOS; defended.
- (9) ARGOS, south-east of LINARIA; defended.
- (10) TRACHILES, on the high ground immediately east of the Cape in a small house; defended with 1 machine gun.
- (11) EMPORIO; defended with 1 machine gun.
- (12) PEZONDA; south of ATSIPA Bay; defended.

- (9) On Mount PROFETA ELIA: an ammunition depot.
- (10) CORIO, near the barracks: a small ammunition depot.
- (11) DASSO, probably near the barracks: an ammunition depot.
- (12) PEZONDA, in the O.P.: ammunition stores.
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- (11) EMPORIO: defended with 1 machine gun.
- (12) PEZONDA: south of ATSIPIA Bay: defended.
- (13) PANAGHIA of KASTELI, in the Church or Monastery of PANAGHIA.

(ii) Movable Armament

See DODECANESE—GENERAL.

(iii) Searchlights

Searchlights are mounted on the Island: location not known.

(iv) Local Seaward Defences

Minefields

Mines have been laid as follows:—

- (a) Between C. TELOS, KALIMNO and C. STAVROS, PATMOS.
- (b) Between SKIROMETO POINT, KALIMNO, and KUM POINT, KOS.
- (c) Between C. AGHIOS GIORGIOS, KALIMNO, and C. CEPHALOS, KOS.

100 KALIMNO

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

1940. P.D. No. 1 Battery. VLICADIA: sited on the high ground at the northern end of VLICADIA Bay: ? guns of ? calibre.
1940. P.D. No. 2 Battery. MOLIAS OF LINARIA in the BRUSTA area (over-looking LINARIA Bay): 8 guns of ? calibre.
1940. P.D. No. 3 Battery. TELENDO Island (1): sited in a tunnel dug out of a cliff: ? guns of ? (3.5-in. or 4-in.) calibre.
1940. { P.D. } No. 4 Battery. TELENDO Island (2): sited in a tunnel dug out of a cliff: ? guns of ? (3.5-in. or 4-in.) calibre.
1940. { E.D. }
- No. 5 Battery. CAPE TELOS: in the extreme north of the Island, commanding the Straits of LERO: ? guns of 7-in. calibre.
1940. P.D. No. 6 Battery. PORT VATI: ? guns of ? calibre.
- No. 6A Battery. CATZOUNI: 1 gun of ? calibre.
1940. No. 7 Battery. PORT KALIMNO: sited just north of Port KALIMNO, near a church: 2 guns of 2.5-in. calibre.
1940. No. 8 Battery. LA FLASCA: sited in the valley: 2 guns of 2.5-in. calibre.

(e) Local Defences

There are barbed wire entanglements—

- (i) round the harbour of Port KALIMNO;
- (ii) round the central ammunition store;
- (iii) round the observation post at Mount PROFETA ELIA;
- (iv) round LAPASSI Bay, east of POTHIA;
- (v) VATHI, at the head of the bay on the south shore.

Guard Houses with machine gun posts exist as follows:—

- (1) AGHIA VARVARA, on the summit of the hill: 2 machine guns.
- (2) EMBORIO, at the point HOHLAKARIKA, 50 yards from the sea, defending the KALIMNO-LEMNOS cable: 3 machine guns.
- (3) MONTE PROFETA ELIA, in the observation tower: 3 to 4 machine guns.
- (4) LAFASSI, on a precipice opposite the shipbuilding yard: 2 machine guns.
- (5) South side of Port KALIMNO harbour, defending the oil tanks: 3 machine guns.
- (6) St. NICOLAS, above the last houses, south of the harbour: 3 machine guns.
- (7) From Cape PRIONAS to Cape CALI, at intervals with Q.F. guns (possibly A.A.) and machine guns.
- (8) SIKATI, at the head of the Bay: 4 machine guns, crews in tents.
- (9) Church or Monastery of ANASTASI, north of VATI: 1 machine gun.
- (10) S. IRENE Bay, 1 machine gun in the MENDARENE warehouse and another further down the bay towards the sea and another west of the warehouse near the Church of ANASTASI. To the north, 30 yards from the sea, another machine gun. The men are housed in the church and in a stone built room.
- (11) KREMASTOS, on the south side of Port VATI: 1 machine gun.
- (12) LAFASSI near POTHIA: a guard house.
- (13) HAKIDOU'S House, near shore, east of POTHIA: guard house.

1940. P.D. No. 6 Battery. PORT VATI : ? guns of ? calibre.
 No. 6a Battery CATZOUNI : 1 gun of ? calibre.
 1940. No. 7 Battery. PORT KALIMNO : sited just north of Port KALIMNO,
 near a church : 2 guns of 2.5-in. calibre.
 1940. No. 8 Battery. LA FLASCA : sited in the valley : 2 guns of 2.5-in.
 calibre.

(e) Local Defences

There are barbed wire entanglements—

- (i) round the harbour of Port KALIMNO ;
- (ii) round the central ammunition store ;
- (iii) round the observation post at Mount PROFETA ELIA ;
- (iv) round LAPASSI Bay, east of POTHIA ;
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- (10) S. IRENE Bay, 1 machine gun in the MENDARENE warehouse and another further down the bay towards the sea and another west of the warehouse near the Church of ANASTASI. To the north, 30 yards from the sea, another machine gun. The men are housed in the church and in a stone built room.
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- (12) LAFASSI near POTHIA : a guard house.
- (13) HAKIDOU'S House, near shore, east of POTHIA : guard house.
- (14) SPANDO'S House, west of and near HAKIDOU'S House.
- (15) YAVASSI'S House, west of and near SPANDO'S House : 1 machine gun ; the crew are billeted in a cave.
- (16) Port KALIMNO slaughterhouse near southern extremity of the town : 3 machine guns, 15 yards apart.
- (17) KARAVIA, near AGHIOS GIORGIOS, near a hill with a church on it : 1 machine gun and 1 mortar.
- (18) LINARIA Bay, on the beach at the head of the bay : a guard house. On a suspicious rock on the shore : a machine gun post.
- (19) RAFES, sited above a well : 2 machine guns.
- (20) KOKINA FRIDIA, near and south of RAFES : 1 machine gun.
- (21) MIRTIES, in a house on the beach : 1 machine gun and 1 mortar.
- (22) ARGANO Bay, at the head of the bay : 3 machine guns.
- (25) SCALIA, near A.A. BATTERY No. 6A : 1 machine gun.

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(c) *Magazines and Munitions Stores*

- (1) Near VOUVALI barracks, south and east of 3 windmills below the barracks. This is the central ammunition store with over 100 tons of ammunition; it is 6,500 square ft. in area and is protected on the south, east and west by a triple row of barbed wire entanglements.
- (2) EPTA PARTHENES, in an old quarry just outside the town of Port KALIMNO: ammunition.
- (3) Under the house of Dr. Calvares, opposite a petrol store: hand grenades.
- (4) Port KALIMNO: torpedoes.
- (5) Downhill from the artillery headquarters, in a bungalow: artillery shells.
- (6) VOUVALI Nautical School, in the extreme north-east end: military stores.
- (7) Under the ROMA Cinema, on the CHRISTOS Road, 500 yards from the VOUVALI Nautical School: military stores.
- (8) Opposite barracks at POTHIA in a large house without a roof there is 1 room which is an ammunition store.
- (9) On Mount PROFETA ELIA: an ammunition depot.
- (10) CORIO, near the barracks: a small ammunition depot.
- (11) DASSO, probably near the barracks: an ammunition depot.
- (12) PEZONDA, in the O.P.: ammunition stores.
- (13) Monastery or church of ANASTASI: ammunition stores.
- (14) MOURALIA, on the south side of VATI Bay: ammunition stores.
- (15) CAZZUNI, in a small storehouse: ammunition stores.
- (16) SISTERNI, near the O.P., in a tunnel: ammunition dump.
- (17) AGHIOS PETROS, in a church on a hill, south of Port KALIMNO: ammunition stores.
- (18) Port KALIMNO slaughterhouse, below the road: an ammunition store.
- (19) KARAVIA, near AGHIOS GIORGIOS, near a machine gun post in a store hut: ammunition store.
- (20) TRACHILES, in the O.P. in a small house: ammunition stores.

Observation Posts

- (1) At the summit of Mount PROFETA ELIA: defended.
- (2) M. CHIRASSILI, about 1 mile due north of VATI: defended with 1 machine gun.
- (3) ROMNIS, north-west of and near VATI: defended with 1 machine gun.
- (4) MOURALIA, on the south shore of VATI Bay: defended with 1 machine gun.
- (5) CAZZUNI, south of VATI, in a small stone house: defended with 1 machine gun and 1 mortar.
- (6) SISTERNI, north-east of and near POTHIA: defended.
- (7) THERMO, south of POTHIA: defended with 1 machine gun.
- (8) PEZOULES, adjoining C. AGHIOS GIORGIOS: defended.
- (9) ARGOS, south-east of LINARIA: defended.
- (10) TRACHILES, on the high ground immediately east of the Cape in a small house: defended with 1 machine gun.
- (11) EMPORIO: defended with 1 machine gun.
- (12) PEZONDA: south of ATSIPIA Bay: defended.
- (13) PANAGHIA of KASTELI, in the Church or Monastery of PANAGHIA.

- (9) On Mount PROFETA ELIA : an ammunition depôt.
- (10) CORIO, near the barracks : a small ammunition depôt.
- (11) DASSO, probably near the barracks : an ammunition depôt.
- (12) PEZONDA, in the O.P. : ammunition stores.
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- (5) CAZZUNI, south of VATI, in a small stone house : defended with 1 machine gun and 1 mortar.
- (6) SISTERNI, north-east of and near POTHIA : defended.
- (7) THERMO, south of POTHIA : defended with 1 machine gun.
- (8) PEZOULES, adjoining C. AGHIOS GIORGIOS : defended.
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- (10) TRACHILES, on the high ground immediately east of the Cape in a small house : defended with 1 machine gun.
- (11) EMPORIO : defended with 1 machine gun.
- (12) PEZONDA : south of ATSIPA Bay : defended.
- (13) PANAGHIA of KASTELI, in the Church or Monastery of PANAGHIA.

(ii) Movable Armament

See DODECANESE—GENERAL.

(iii) Searchlights

Searchlights are mounted on the Island : location not known.

(iv) Local Seaward Defences

Minefields

Mines have been laid as follows :—

- (a) Between C. TELOS, KALIMNO and C. STAVROS, PATMOS.
- (b) Between SKIOMETO POINT, KALIMNO, and KUM POINT, KOS.
- (c) Between C. AGHIOS GIORGIOS, KALIMNO, and C. CEPHALOS, KOS.

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(v) Local Air Defences

(a) Anti-Aircraft Batteries:—

1940. P.D. No. 1 A.A. Battery. Mount SAN PIETRO, to the south of Port KALIMNO: 3 A.A. guns of 3-in. calibre.
1940. P.D. No. 2 A.A. Battery. VLICADIA, sited on high ground at the northern end of the harbour: 2 A.A. guns of 3-in. calibre.
1941. No. 2A A.A. Battery. TRACHILO: 1 A.A. gun of 3-in. calibre.
1941. No. 2B A.A. Battery. KOKINA PRIDIA: 1 A.A. gun of 3-in. calibre.
1941. No. 2C A.A. Battery. RATES: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 3 A.A. Battery. MIRTIES, sited on the beach: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 4 A.A. Battery. Monte PATELLA: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 5 A.A. Battery. Monte PROFETA ELIA (1), mounted on the north-western side of the mountain: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 6 A.A. Battery. Monte PROFETA ELIA (2), mounted on the south-eastern side of the mountain: 2 A.A. guns of 3-in. calibre.
1941. No. 6A A.A. Battery. SCALIA, 1 A.A. gun of 3-in. calibre.
1941. No. 6B A.A. Battery. BORIO: 1 A.A. gun of 3-in. calibre.
1940. P.D. No. 8 A.A. Battery. Monte CHIRASSILI, about 1 mile due north of VATHI: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 9 A.A. Battery. VATHI, sited near the harbour: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 10 A.A. Battery. POTHIA (2) at the eastern extremity: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 11 A.A. Battery. POTHIA (1), at the western extremity: 2 A.A. guns of 3-in. calibre.
1940. P.D. No. 12 A.A. Battery. LAFAZI, to the north-east of Port KALIMNO: 2 A.A. guns of 3-in. calibre.

(b) A.A. Close Defence:—

There are two A.A. machine guns on the roof of the Customs House and on the VOUVALI Nautical School.

(viii) Garrison

In all the garrison numbers about 1,000 men.

(13) Reconnaissance

The Island consists of rocky hills and escarpments and its coastline is mostly composed of steep cliffs and mountain slopes.

Beaches and Possible Landing Places

PALAIQ Bay: a beach at the head of the bay about 50 yards long, shingle with a low slope behind. This only leads to SICATI.

ATSIPA Point: a short possible landing beach.

VATHI: a beach round the head of the bay.

CHALI: shelving limestone, wave-worn, descends to deep water. Landing from boats would be possible, but the whole promontory is commanded by high ground west of the narrow neck about a mile from the point.

1940. P.D. No. 8 A.A. Battery. Monte PROTEA (2), mounted on the southern eastern side of the mountain: ? A.A. guns of ? 3-in. calibre.

- 1941. No. 6A A.A. Battery. SCALIA, 1 A.A. gun of ? 3-in. calibre.
- 1941. No. 6B A.A. Battery. BORIO: 1 A.A. gun of ? 3-in. calibre.
- 1940. P.D. No. 8 A.A. Battery. Monte CHIRASSILI, about 1 mile due north of VATHI: ? A.A. guns of ? 3-in. calibre.
- 1940. P.D. No. 9 A.A. Battery. VATHI, sited near the harbour: ? A.A. guns of ? 3-in. calibre.
- 1940. P.D. No. 10 A.A. Battery. POTHIA (2) at the eastern extremity: ? A.A. guns of ? 3-in. calibre.
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CHALI: shelving limestone, wave-worn, descends to deep water. Landing from boats would be possible, but the whole promontory is commanded by high ground west of the narrow neck about a mile from the point.

The small cove on the north side, SCHIETRI, is sheltered except in east wind. There are other coves on either side of the isthmus, but all have rocky slopes.

VLICHADIA Bay: has fairly steep rocky sides but has 100-150 yards of shingle at the head of the bay and gentle slopes behind it. There is a track to VOTHINOUS at the east end of the shingle, commanded by spurs of the CABBIA Hill behind C. S. GEORGIO.

TOLMI Head: at the head of the bay to the east of this promontory the coast shelves and there is some shelter from the south-west for small craft.

Opposite the small island of AGHIOS ANDREAS there is a steep slope which is not precipitous with a track to AGHIOS CATARINA about a mile inland. AGHIOS ANDREAS Church could command the cove.

PITARI Bay: south-west of C. TRACHILA, a steep open slope to the shore obstructed by rocks in the water which have fallen from above. There is no access to interior except up a very narrow gorge between M. CASSALA and M. MERAVIGLI leading to ARGOS inland plain.

KALIMNO
KHALKIA AND ALIMNIA 103

LINARIA Bay: there is a beach north of the road leading inland as far as a little bluff with houses, 60-70 ft., but behind it are houses and plantations with rubble walls over the whole floor of the LIROSTA Valley. All is commanded by high ground on both sides of the road to CORIO.

MIRTIES: beach; inland are walled plantations.

ARGANO Bay: here there is a beach at the head of the bay; it is obstructed by plantations.

EMPORIO Bay: here there are a few yards of single beach and, slightly eastwards in MIRTIES Cove, there is a further small beach or very low terrace with access to mule tracks in both directions.

SIKATI Bay: at the head of the bay there are a few yards of beach.

KALIMNO Island: about $4\frac{1}{2}$ miles north-east of ATSIPIA Point there is a landing cove at the steep south side of the lighthouse.

The defence of the Island is not difficult if proper use is made of its natural defences.

KHALKIA (INCLUDING ALIMNIA AND SMALL ADJACENT ISLANDS)

(Lat. $36^{\circ} 14' N.$, Long. $27^{\circ} 42' E.$ (KHALKIA); Lat. $36^{\circ} 13' N.$, Long. $27^{\circ} 35' E.$ (ALIMNIA).)

(See Plans 97 and 104.)

Reports marked * are of doubtful reliability.

(1) General Remarks

This small group of Islands, which are high, rugged and barren in character, lies to the north of Cape MONOLITHOS (RHODES), at a distance of about 5 miles. Of the group, KHALKIA and ALIMNIA only are of any size or importance; the former is about 5 miles long with an average width of 2 miles, the latter 2 miles by $1\frac{1}{4}$ miles. The inhabitants of KHALKIA number about 500 and are mostly sponge divers.

(2) Port Facilities

KHALKIA

There is a small harbour in EMPORIO Bay sheltered by an islet situated at the south-east end of the island.

ALIMNIA

There is a small sheltered harbour situated at the south-west end of the island.

Small to medium vessels only can use these harbours.

The following have been observed at one time in ALIMNIA Harbour:—

Three destroyers of about 600-700 tons.

One cargo steamer of about 4,000 tons.

Three M.A.S. used for patrolling the vicinity.

Two submarines.

There is however no evidence that these ships are permanently based there.

The anchorage for destroyers is off the entrance to the small bight east of the southern point of ALIMNIA Harbour. There is also a naval anchorage off EMPORIO Bay on the east side of the Island.

Submarines

The harbours of both KHALKIA and ALIMNIA make some provision for submarines. Several have been seen in the harbour and in the naval anchorage off EMPORIO Bay on ALIMNIA.

(Lat. 36° 14' N., Long. 27° 42' E. (KHALKIA); Lat. 36° 13' N., Long. 27° 35' E. (ALIMNIA).)

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(3) The Town

KHALKIA Village is modern with houses behind the beach, and cultivated land westward round the head of another Port PONTAMO, opening south, and traversed by the track to the old village CORIO. There is a modern road across the neck, 80 ft., between the two Ports.

The population is Greek; most of the men are sponge-fishers, frequenting Cyrenaic and Egyptian sponge-grounds. Barley, wheat, olives, and almonds are grown, but most of the island is pasture for sheep and goats.

ALIMNIA Village

This is only a small village with gardens and plantations.

(4) Government Establishments

Barracks

*On the eastern corner of the bay, north of ALIMNIA Village, there is a large house surrounded by a square-shaped garden known locally as Dr. Zervos villa, which is used as a barracks for the small garrison.

(C46758)

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Fuel

Work on underground storage tanks is being speeded up but their position is not located. *They are to take some of the stocks at present stored in forests on RHODES which are liable to be fired by bombing.

*Petrol from LERO and RHODES is transferred at night to ALIMNIA by small tankers.

(7) Air Facilities

On ALIMNIA there are an aerodrome and a seaplane station: the latter is in EMPORIO Bay (Lat. 36° 15' N., Long. 27° 40' E.), where floating aircraft have been seen.

(10) Transport Facilities

Steamers from RHODES call occasionally at KHALKIA.

(11) Signal Communications

W/T Stations

On KHALKIA

(a) above EMPORIO Bay, a small station, probably for inter-island communication.

*(b) At MYLOI.

On ALIMNIA

*In Dr. Zervo's house, used as a barracks.

V/S Station

There is a small station on ALIMNIA.

(12) Defences

(i) Seafront Defences

(a) Coast Defence Batteries

No. 1 Battery. MYRTOS Point (KHALKIA 1): one gun of (?) 3-in. calibre.

No. 2 Battery. TRAKHIA Point (KHALKIA 2): one gun of (?) 3-in. calibre.

No. 3 Battery. EMPORIO Bay on the high ground to the south: one gun of (?) 3-in. calibre.

No. 4 Battery. AGIOS THEODOROS Island: two guns of (?) 3-in. calibre.

No. 5 Battery. MERMIGAS Pt. (west point of harbour entrance) two guns of 4-in. calibre.

No. 6 Battery. Southern point of the harbour entrance: two guns of 4.7-in. calibre.

No. 7 Battery. On the central hill, south-east of the harbour entrance (?) four guns of (?) 6-in. calibre.

(b) Magazines

There are stores of war material on KHALKIA and ALIMNIA: the former are underground.

(c) Observation Post

There is an observation post on TRAKHIA Point, on KHALKIA.

(iv) Local Seaward Defences

Minefields

Mines are laid between ALIMNIA and GLIPHANI, on RHODES.

(v) Local Air Defences

Anti-Aircraft Guns

On KHALKIA, four A.A. guns of unknown calibre.

On KHALKIA

(a) above EMPORIO Bay, a small station, probably for inter-island communication.

*(b) At MYLOI.

On ALIMNIA

*In Dr. Zervu's house, used as a barracks.

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There are stores of war material on KHALKIA and ALIMNIA: the former are underground.

(c) *Observation Post*

There is an observation post on TRAKHIA Point, on KHALKIA.

(iv) *Local Seaward Defences*

Minefields

Mines are laid between ALIMNIA and GLIPHANI, on RHODES.

(v) *Local Air Defences*

Anti-Aircraft Guns

On KHALKIA, four A.A. guns of unknown calibre.

*On ALIMNIA, the troops garrisoned north of the village are equipped with A.A. light guns and pom-poms.

(viii) *Garrison*

There are about 150 men on KHALKIA and ALIMNIA.

(13) Reconnaissance

KHALKIA

KHALKIA Island is about 7 miles from east to west and 3 miles from north to south; and in area some 20 square miles.

The island is a rectangular, hilly, barren prolongation of the chain of islands which run west from C. MINAS on the west coast of RHODES. It consists of hard limestone overlaid with softer marls and shales, with some rough building stone. There are no perennial streams and only three wells; rain water is collected in cisterns.

KHALKIA AND ALIMNIA**KOS 105**

The watershed ridge runs obliquely from C. MIRTO in the south-west to C. LIMANARI in the north-east, rising to M. ELIA, 1,880 ft., in the centre, and M. MIROIGLI (MERAVIGLI), 1,950 ft., further east. The south coast is very steep, except a low peninsula ending in C. ICALOS, and connected by a low isthmus, 25 ft., with short beaches but difficult access to the mediaeval fortress and village on the ridge, 900 ft. The north coast also is steep, but more indented, with several coves opening north. The west coast is more open, with small coves, but no inhabitants. The east end of the island lies lower and is prolonged seaward in NISSO Island and two islets, which screen the port of KHALKIA (also called NIMBORGIO or SCALA) in a bay opening south-east.

ALIMNIA

ALIMNIA Island is 2½ miles from North to South, and 2 miles from East to West. It lies off the West coast of RHODES, with two islets, MAKRI and STRONGILI, midway in the strait. It is a half-submerged prolongation of the ATAIRO-ACROMYM range in RHODES, and consists of hard limestones and schists. The island consists of two parts:—

(1) To the North-West a continuous ridge runs from C. CAZZUNI to East-North-East to C. MERMICA to West-South-West. This range rises to M. VOUNI in the centre and VOUNARAGI, 700 ft. It is precipitous to the South-East, and slopes steeply into deep water to the North-West, with rocky shore and one small open cove. This part of the island is uncultivated. The mediaeval castle on the East slope of M. VOUNI is ruinous and uninhabited.

(2) To the South-East and South a lower ridge with hummocks not exceeding 300 ft. and rocky shores is nearly divided near its Southern end by deep coves and a narrow isthmus of a few yards. On a wider neck rising to 100 ft. between EMPORIO Cove, with a short beach opening East, and ALIMNIA Bay opening South-West is ALIMNIA village sited on the hillside facing East with a longer beach, 400 yards, behind which are gardens and plantations. There is anchorage and landing for boats at EMPORIO as well as in ALIMNIA Bay.

Between these two parts of the island is ALIMNIA Bay, 1½ miles from North-East to South-West, opening South-West with a channel about 500 yards wide: the South-East point and the inner spur with S. MINAS' chapel are foul.

KOS

(Lat. 36° 53' N., Long. 27° 20' E. (KOS TOWN).)

(See Plan 98.)

Reports marked * are of doubtful reliability.

(1) General Remarks

There is no permanent Naval Base at KOS: from time to time a destroyer visits KOS Road.

The island of KOS lies from North-East to South-West opposite the Guli of KOS, with its east end 10 miles due North of Cape KRIO and its Northern promontory, KUM Point ("Sandy Point"), 2½ miles South of the HUSSEIN Point. The island is 28 miles long from East to West, and 6 miles wide between ANDEMAKI Point and MASTIKARI Point: its area is about 109 square miles.

An abrupt ridge of hard limestone extends from the East and above Cape PHUKA ("Seal Point") nearly to ANDEMAKI town. The highest points of this ridge are: DIKEO (2,870 ft.), ELIAS (2,760 ft.) in the centre; PIPERIA (1,530 ft.) and ERIMITTI (1,400 ft.), near the East end; and the peak above PYLIE village (1,300 ft.). The ridge is very steep and rugged on its Southern face, excepting the deep sheltered valleys behind the landing place of CARDAMINA near the Custom House. On the North side the steep limestone crest

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West of ANDEMAKI town the limestone ridge disappears and the soft marls form rolling upland, continuous from coast to coast, with steeper slopes Southward and with gentle slopes Northward intersected by torrent beds. Much of this district is cornland and vineyard. There is a small cove West of these lowlands on the South coast under Cape TIGANI.

Beyond an isthmus one mile wide is the rugged headland of KEPHALO which consists of a North-South ridge of various hard rocks, rising to 1,300 ft. towards the Southern promontory of KRIKELO. Its steeper Eastern face shelters KAMARA Bay, where there is water and a small settlement. KEPHALO is mostly rough pasture, with a few sheltered patches of vineyard and olive and a few country houses.

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The chief products are grain, wine, olive oil, tobacco, fresh fruit and vegetables. The population is 10,000.

Anchorage

KOS Road is the only anchorage; it is open to the North-North-East and therefore unsuitable in the North and Easterly winds. Large vessels anchor North-North-Eastward of the old Castle in any convenient depth, mud and weed.

(2) Port Facilities

MANDRACHIO Harbour

Entrance to MANDRACHIO Harbour is through a narrow sinuous channel, 53 yards long with a depth of water of 14 ft.; the maximum depth of the basin itself is 13 ft. and is used by fishing boats.

The Southern shore has been arranged to form a quay where strong bollards have been placed at suitable intervals.

Piers and Jetties

KOS Road

There is one small pier which projects from the coast about 100 yards South-East of the Castle; it is 246 by 16 ft., with a depth of water of 18 ft. at its end; this depth gradually decreases towards the shore.

PSALIDA

Here there is a small pier.

Harbour Craft

There are 10 small two-masted sailing craft of from 50 to 60 tons each, some of which have auxiliary motors; they are owned by the inhabitants.

(3) The Town

KOS Town, the Capital, is of no military or strategic value: all kinds of supplies can, however, be obtained.

It is situated on the North-Eastern coast in an open bay with good anchorage, between LURO Point and KUM Point. The small land-locked port (MANDRAKI) opens Northward and is screened seaward by a low bluff of soft rock, on the Northern end of which is a medieval castle. South of the deep moat of the castle is the square, with the Government offices and the principal Mosque; thence there is a short descent Southward to the modern stone jetty and promenade (foro Italico), 200 yards behind which are the barracks. Much of the area within the medieval walls has been excavated to a depth of about 10 ft. The modern market place and business quarters lie inland, South-East of the port and the old walls. On the sand spit North of the port is a settlement of Cretan Moslems, and beyond this a row of windmills.

Water Supply

The medieval aqueduct runs straight from the VORINA spring, about two miles away, high up on the mountain side, and enters the town from the South. Water is laid on to the pier in KOS Road; there is a tap at the inner end.

(4) Government Establishments

(i) *Headquarters*

Military H.Q. are established in the Museum which is sited in a building between the FASCIO H.Q., the Turkish Mosque and the Cathedral of AGHIA PARASKEVI.

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(ii) Barracks and Encampments

(a) KOS Town: to the South-Eastward—large Barracks for 4,000 men.

(b) KOS Town: about $\frac{3}{4}$ mile to the South-Westward, on the main road—Barracks.

(c) KOS Town: about 1 mile to the South-Westward, further along the main road at a point where the main North and South road crosses it—Barracks.

* (d) KOS Town: one building painted white and one painted grey—two large Barracks; also 10 small wooden sheds used as Barracks.

(e) GHERME: $1\frac{1}{2}$ miles South-West of KOS in Barracks and Houses—accommodation for 1,000 men.

(f) S. MARIA AUSILIATRICE (PANAGHIA SINTRIANI): to the south of KOS Town, on the stream PLATI POTAMOS, about 1,800 yards from the beach—an encampment for about 500 men in tents.

* (g) ANDEMAKI: in the centre of the Island—1,500 troops stationed.

* (h) KEPHALO: in the Western part of the Island—accommodation in Barracks for 150 men, and $4\frac{1}{2}$ miles North of KRIKELO Point—an Infantry Regiment encampment.

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* (i) Monte DIKEO: on the Southern coast of the Island, sited on the Southern slopes of the mountain 240°—Town of KOS, six miles—an Infantry Regiment encampment.

(j) LINOPOTI (ANGUILARA): in the Italian Colonists' Village North-East of PYLI, in Houses—accommodation for 600 men.

(k) CARDAMENA: on the South coast—accommodation in Houses for 250 men.

(iii) Fuel Storage

* (a) Near Barracks marked "c" under "Barracks and Encampments" in an underground grotto or in galleries, in the hill near the cross-roads mentioned—a Petrol (or Munitions) Depot. The entrance is on the South side of the hill on the Northern slopes of which there are seven sheds the function of which is not known.

(b) At PANAGIA. TSOUKALARIO, sited 140°. Town of KOS, 2 miles—three Petrol Tanks.

(c) KOS Barracks: in the grounds of one of the Barracks mentioned at "(d)" under "Barracks and Encampments"—large underground Oil Tanks (probably for Petrol).

(d) ANDEMAKI Aerodrome: in the North side—Benzine is stored in Tanks, Barrels or Tins.

(e) ZIBARI: about 250 tons of Benzine in barrels, in 12 Houses easily visible from both sides of the road.

* (f) Near C. KUM BURNU, about 2,200 yards North of the entrance to KOS Harbour, in the last building to be met with when going from the town to KUM BURNU—a Benzine Reservoir.

* (g) In the locality known as ABRABI, about 150 yards South-West of the town's aqueduct, in a reinforced concrete building—a Petrol Store.

* (h) Sited 200 yards West of the aqueduct, on the edge of a pathway leading from ABRABI to GHERME—5 Petrol Reservoirs each holding 5 tons.

Note.—* It was reported in March, 1940, that 1,500 tons of Petrol had arrived in KOS.

Aviation Fuel Storage

KETENGOLU: in new buildings near 5,000 drums, each of 4 cwt. of Aviation Benzine.

(iv) Provision Stores

The following buildings in KOS Town are used as Provision Stores:—

(a) In the Jewish Quarter (North-West sector).

(b) At the Customs House (West sector).

(c) In the basement of the Club (South-West sector).

(d) In the Mosque, near a big plane tree (South sector).

(e) In the wheat store (South-East sector) on the seashore.

(f) In building near the Slaughter House.

(g) On the seafont of KOS Harbour to the West of the Town in buildings.

Further Provision Stores have been located in other parts of the Island as follows:—

(a) ANGULARIA: an Italian village of 35 families which is sited South of the Salt Lake near the North coast.

(b) PYLIE: sited between PYLIE and the Salt Lake.

(7) Air Facilities

Barracks and Encampments—large underground tanks, probably
(d) ANDEMAKI Aerodrome: in the North side—Benzine is stored in Tanks, Barrels or Tins.

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(g) On the seafloor of KOS Harbour to the West of the Town in buildings.

Further Provision Stores have been located in other parts of the Island as follows:—

(a) ANGULARIA: an Italian village of 35 families which is sited South of the Salt Lake near the North coast.

(b) PYLLE: sited between PYLLE and the Salt Lake.

(7) Air Facilities

Aerodromes

(a) ANDEMAKI: sited about 1½ miles South-East of ANDEMAKI in Lat. 36° 48' N., Long. 27° 11' E. (approx.); in shape it is triangular with sides 1,100, 770 and 660 yards. It has no hangars or workshops.

*(b) KEPHALOS: about half a mile West of the village—probably an Emergency Landing Ground.

(c) LAMBI: near Punta della SABBIA.

*(d) LAMBI: a landing ground is under construction.

(9) Power Plant

(a) There is a Power Station in the centre of the Town of KOS.

*(b) A building sited on the starboard hand entering the port is a Power Station.

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(10) Transport Facilities

Roads

From KOS Town a modern military road skirts the foothills, about a mile from the North coast; it passes North of the detached hill FLIA (680 ft.) and then rises toward the watershed on which ANDEMAKI town lies. There are steep by-roads to the hillside villages of ASPENDIO (1½ miles) and PYLLE (2 miles). From ANDEMAKI the main road follows the watershed to CEPHALO; a side track descends to CARDAMENA.

Another good road leads from KOS to TEMPIO di ESCULAPIO, about 2 miles to the South-West through GHERME.

Mule tracks connect small villages.

Sea

See RHODES.

(11) Signal Communications

V/S Station

There are V/S Stations (a) at KEPHALA which can communicate with KANDELIUSA Island; (b) above C. PHOCAS—Heliograph and Lamp Station; (c) On VUNO Hill—on the road leading from MASTICARI to ANTIMACHIA—Heliograph and Lamp Station.

W/T Stations

- (a) To the South of KOS Town: position uncertain.
- (b) Near the coast to the West of KOS Town: two buildings and a mast.
- (c) Half a mile South of Punta LICORIZA, on the North-Western coast.

Telephone

There is telephonic communication between all important villages in the Island.

Cables

There is cable communication with NISERO—the cable landing is at CARDAMENA on the South coast; and with KALIMNO Island—the cable landing is near MASTICARI on the North coast.

The cable landings are both marked by small stone huts close to the shore.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

Date of Report.

- 1940. No. 1 Battery: C. PHUKA, the most Eastern point on the Island. (?) guns of (?) calibre.
- 1940. No. 2 Battery: Monte PIPERIA. Emplacements only.
- 1940. No. 3 Battery: PROFITAS ELIAS. One gun of 8.6-in. calibre.
- 1940. No. 4 Battery: ST GIORGIO (VALAREE), on the South-East coast. Emplacements only.
- 1940. No. 5 Battery: ANDEMAKI Point. Twelve guns of ? calibre, mounted near a windmill. The existence and position doubtful: it is possible that these guns are A.A. guns mounted at or near ANDEMAKI Aerodrome, some 3 miles to the Northward.
- 1940. No. 6 Battery: CHRISTOS. Four guns of 8.6-in. calibre.

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- 1940. No. 6 Battery: CHRISTOS. Four guns of (?) calibre.
- 1940. No. 7 Battery: KEPHALO, mounted near some mills. Six guns of 4.7-in. calibre.
- 1940. No. 8 Battery: MASTIKARI Point, on the North-West coast. (?) guns of (?) calibre.
- 1940. No. 9 Battery: TINGACHE, position doubtful, but battery is mounted to control the KAPPARI Channel. One gun of 8.6-in. calibre.
- 1940. No. 10 Battery: KUM Point, to control the KOS Channel when completed. Emplacements only.
- 1940. No. 11 Battery: GHERME, mounted on the Northern slopes of the hill, guarding the KOS Channel. Six guns of 4.7-in. calibre.
- 1940. *No. 12 Battery: KOS Town, position and existence doubtful. (?) guns of (?) calibre.
- 1940. *In store (and may now be mounted). 12 guns of 5.5-in. calibre and 21 guns of 8.3-in. calibre.

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(b) Observation Posts

- (i) AGHIOS PHOKAS: heliograph and lamp signals; telephone to KOS Town; movements of all vessels in Port of BUDRUM are visible through a telescope.
- (ii) 322°, KRIKELO Point, 2.5': two huts and a mast: may be a War Signal Station.
- (iii) MASTIKARI Point.
- (iv) KEPHALO.
- (v) On the road between MASTIKARI Point and ANDEMAKI: with heliograph and lamp and telephone to KOS Town.
- (vi) AGHIOS JOANNIS, on the top of a hill.

(c) Wire Entanglements, etc.

All beaches must, in the absence of definite information, be considered as defended. The beach defences consist of a double line of barbed wire on wood and iron posts which are erected at the water's edge: behind this wire trenches have been dug and machine-gun posts constructed.

Such defences have been located as follows:—

- KRIKELO Point: all round the point.
- C. PHUKA: all round the point, where two machine guns have been sighted.
- KUM Point to TINGACHE.

KUM Point to LURO Point, all round KOS Road: machine guns round KOS Road are concealed behind shrubs: one has also been located on the bathing beach below the old Fort, one near the jetty, and two others at MOLINA LAPA: four or five machine guns are also sited amongst the mills at KUM Point.

(d) Magazines, etc.

- (i) PANAGIA TSOUKALARIO. Sited 140°, Town of KOS, about 2 miles, opposite a small white church, in galleries covered with plane trees. Four Ammunition Stores and three Stores containing A.A. material, searchlights, etc.
- (ii) CHRISTOS. Sited at 295°. ANDEMAKI Point, 3½ miles, at the edge of an olive grove. Underground Ammunition Stores.
- (iii) STAVROS. In the School. Depot for ammunition and hand grenades.
- *(iv) KEPHALO. Munition Depot.
- *(v) ST. ASKENDIO. Munition Depot.
- *(vi) C. PHUKA. Munition Depot.
- (vii) KOS Town Gymnasium. Ammunition Stores.
- (viii) KOS Town Museum. Ammunition Store.
- (ix) KOS Town, on the road, 200 yards above the town reservoir, built of concrete. An Ammunition Store.
- (x) 150 yards south of (ix). Five wooden huts, camouflaged green, in a dip. Ammunition Store.

(ii) Movable Armament

See DODECANESE—GENERAL.

(iii) Searchlights

- (a) On the high ground North of KEPHALA Head.
- (b) PANAGIA TSOUKALARIO, South of the Town of KOS.
- (c) C. CRICHELO, on high ground on the Western point of the cape.

(iv) Local Seaward Defences

Such defences have been located as follows:—

- KRIKELO Point: all round the point.
- C. PHUKA: all round the point, where two machine guns have been sighted.
- KUM Point to TINGACHE.
- KUM Point to LURO Point, all round KOS Road: machine guns round KOS Road are concealed behind shrubs: one has also been located on the bathing beach below the old Fort, one near the jetty, and two others at MOLINA LAPA: four or five machine guns are also sited amongst the mills at KUM Point.

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- * (vi) C. PHUKA. Munition Depot.
- (vii) KOS Town Gymnasium. Ammunition Stores.
- (viii) KOS Town Museum. Ammunition Store.
- (ix) KOS Town, on the road, 200 yards above the town reservoir, built of concrete. An Ammunition Store.
- (x) 150 yards south of (ix). Five wooden huts, camouflaged green, in a dip. Ammunition Store.

(ii) *Movable Armament*

See DODECANESE—GENERAL.

(iii) *Searchlights*

- (a) On the high ground North of KEPHALA Head.
- (b) PANAGIA TSOUKALARIO, South of the Town of KOS.
- (c) C. CRICHELO, on high ground on the Western point of the cape.

(iv) *Local Seaward Defences*

(a) *Minefields*

Mines have been laid:—

- (i) From C. KEPHALA, passing close to C. DAPHNI, to C. AGHIOS GEORGIOS on KALIMNO.
- (ii) From KROKELO Point to C. TELOS on KALIMNO.
- (iii) From KUM Point, passing near South coast of KAPPARI, to SKIOMETU Point on KALIMNO.
- (iv) From TINGACHI to C. RUSSA on KAPPARI Island.
- (v) From KUM Point to LURO Point, enclosing KOS Road.

Note.—Caiques entering KOS Road pass within 100 yards of KUM or LURO Points.

(b) *Booms and Nets*

These may exist: none have been reported.

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(v) Local Air Defences

(a) A.A. Batteries

Date of Report.

1940. No. 1 A.A. Battery: AGHIOS PHOKAS. Two A.A. guns of (?) 3-in. calibre.
1940. No. 2 A.A. Battery: PROFITAS ELIAS. Two A.A. guns of (?) 3-in. calibre.
1941. No. 3 A.A. Battery: ANDEMAKI Point. Sited between ANDEMAKI Point and CARDAMENA on the South-East coast.
1941. *No. 4 A.A. Battery: ANDEMAKI Aerodrome. Sited round the Aerodrome. (?) A.A. guns of 3-in. calibre.
1941. *No. 5 A.A. Battery: ANDEMAKI. Sited near some mills. Three A.A. guns of 3-in. calibre.
1941. *No. 6 A.A. Battery: ANDEMAKI (on the Road to KOS). Three A.A. guns of 3-in. calibre.
1941. *No. 7 A.A. Battery: CHRISTOS. Three A.A. guns of 3-in. calibre. One of these is mounted 500 yards upstream from CHRISTOS Church.
1940. No. 8 A.A. Battery: KEPHALO. Two A.A. guns of (?) 3-in. calibre.
1940. No. 9 A.A. Battery: MASTIKARI. Two A.A. guns of (?) 3-in. calibre.
1940. *No. 10 A.A. Battery: ASPENDIO. Sited 1 mile North-North-West of Mount DIKEO. Two A.A. guns of (?) 3-in. calibre.
1941. *No. 11 A.A. Battery: GHERME (1 mile South-West of KOS Town). Three A.A. guns of 3-in. calibre.
1941. *No. 12 A.A. Battery: KUM Point. One A.A. gun of (?) 3-in. calibre.
1941. No. 13 A.A. Battery: KOS Town. Sited 150 yards South of a concrete Ammunition Store which is 200 yards above the town reservoir. One A.A. gun of (?) 3-in. calibre.

One Mobile A.A. Battery was last reported in the vicinity of the Aerodrome, between ANDEMAKI and CARDAMENA.

(viii) Garrison

There are about 4,000 troops in all on the Island and a "considerable increase" is reported.

(13) Reconnaissance

A range of hills running from East to West divides the island into two parts. This range, being in closer proximity to the Southern coast, its ridges abut precipitously on the shore and form a coast line of steep cliffs and narrow valleys. In view of the above, with the exception of a flat strip of coastline, 820 yards long and 1,630 yards in depth, East of the village of CARDAMENA, no other part of the Southern shore is suitable for a landing. This range of hills, rising to a height of 1,475 ft. at the Eastern extremity, gradually loses altitude as it continues Westward. On the other hand, from a point at the Northern end of the island, in the vicinity of the Town of KOS, a strip of territory, 124 miles in length, stretches South-Westward $\frac{1}{2}$ to 14 miles in depth. This area consists of cultivated land and olive groves. South of this region small hills are encountered which increase in height as they stretch towards the South.

Right on the Eastern end of the island there is a flat promontory extending out to sea, which, however, is unsuitable for a landing as it is a roadless and broken region, and too small for the purpose.

Although light forces could be landed on the North-Western region of the island, where paths and mule tracks exist, an advance North or South would be difficult.

The strip of territory 124 miles long, referred to above, should be divided into two sectors.

1941. *No. 7 A.A. Battery : CHKISTOS. Three A.A. guns of 3-in. calibre. One of these is mounted 500 yards upstream from CHRISTOS Church.

1940. No. 8 A.A. Battery : KEPHALO. Two A.A. guns of (?) 3-in. calibre.

1940. No. 9 A.A. Battery : MASTIKARI. Two A.A. guns of (?) 3-in. calibre.

1940. *No. 10 A.A. Battery : ASPENDIO. Sited 1 mile North-North-West of Mount DIKEO. Two A.A. guns of (?) 3-in. calibre.

1941. *No. 11 A.A. Battery : GHERME (1 mile South-West of KOS Town). Three A.A. guns of 3-in. calibre.

1941. *No. 12 A.A. Battery : KUM Point. One A.A. gun of (?) 3-in. calibre.

1941. No. 13 A.A. Battery : KOS Town. Sited 150 yards South of a concrete Ammunition Store which is 200 yards above the town reservoir. One A.A. gun of (?) 3-in. calibre.

One Mobile A.A. Battery was last reported in the vicinity of the Aerodrome, between ANDEMAKI and CARDAMENA.

(viii) Garrison

There are about 4,000 troops in all on the Island and a "considerable increase" is reported.

(13) Reconnaissance

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Right on the Eastern end of the island there is a flat promontory extending out to sea, which, however, is unsuitable for a landing as it is a roadless and broken region, and too small for the purpose.

Although light forces could be landed on the North-Western region of the island, where paths and mule tracks exist, an advance North or South would be difficult.

The strip of territory 12½ miles long, referred to above, should be divided into two sectors, one extending for a length of 6 miles from the Northern end of the Town of KOS to TINGACHI, and the other, of equal length, stretching to the shore at MASTIKARI.

The 1st sector :—

(a) Is suitable for a landing.

(b) In spite of the fact that there is no suitable area for establishing an important bridge-head, good use can be made of the olive groves and small hills in the neighbourhood.

(c) From this point the occupation of the Town of KOS, with the consequent moral effect, might be quickly carried out. In advancing Southwards, however, obstacles might be encountered in the form of a strongly fortified line constructed on the hills which would be difficult to storm and capture outright, if well defended. Furthermore, a landing on the Southern shore of the island, designed to support the above main operation and take the defences in the rear, would be difficult for the reasons already mentioned.

KOS
LERO 111

The 2nd sector :—

- (a) This area of the coast is suitable for a landing and although in the immediate neighbourhood of the shore, the ground is unsuitable for establishing a bridge-head, an advance of 1½ miles would bring a force to an area suitable for this purpose.
- (b) The lie of the land is such that an advance towards the East could be made without much difficulty and could be combined with that of the landing effected in the first sector.

A force disembarked on the flat strip of territory on the Southern coast near CARDAMENA could support and facilitate the advance of the troops landed in the second sector by attacking the enemy defences in the rear. The hills, being of greater altitude in the Eastern region, dominate the surrounding country more fully and render an advance more difficult.

In effecting a landing on this island, a force disembarked in the second sector—the most important—could be supported by a flank attack to be made by a force landed in the first sector on the main enemy defences which face the disembarkation point of the force in the second sector.

If a contingent of mountain troops could be landed on the Southern coast, the attack could then develop from three points, and render the occupation of the island much less difficult. As most of the Ammunition Depôts and Stores are in the neighbourhood of the Town, this is yet another reason for a landing to be effected in the first sector.

The strip of territory 12½ miles long in the Northern part of the island is exposed to the North wind, but in spring and summer this wind is slight and would not prevent the landing of an important force.

There is suitable anchorage available and lighters and small craft could approach the shore without any difficulty or danger.

Villages in this area are scarce and there are a few farms scattered here and there.

The water supply is not plentiful except in the Town.

LERO ISLAND

(Lat. 37° 10' N., Long. 26° 51' E.)

(See Plans Nos. 56, 56A, 56B, and 68.)

Reports marked * are of doubtful reliability

(1) General Remarks

LERO Island is a defended naval base of considerable importance in connection with the strategy of the Aegean and of the eastern basin of the Mediterranean.

The area of the island is about 24 square miles; it has a population of about 4,500.

The following warships are normally based at LERO: two destroyers, four torpedo-boats, fifteen submarines, and approximately fifty M.A.S. These units constitute the entire normal naval forces in the DODECANESE. Frequent visits are paid to the other islands.

The main strategic uses to which this base could be put are:—

- (i) As a convenient "jumping-off" point for operations against the Turks in ANATOLIA. The Italians are known to have made considerable efforts to induce the Turks to afford them facilities for colonisation in ANATOLIA, with no doubt the ultimate

sector on the main enemy defences which face the disembarkation point of the force in the second sector.

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(i) As a convenient "jumping-off" point for operations against the Turks in ANATOLIA.

The Italians are known to have made considerable efforts to induce the Turks to afford them facilities for colonisation in ANATOLIA, with no doubt the ultimate object of effecting economic penetration, as being part of the insistent Italian policy for territorial expansion.

These Italian aspirations have always been viewed with suspicion by the Turks and have met with little sympathy.

(ii) As a base from which to strike against hostile sea communications in the eastern basin of the Mediterranean and in the Aegean.

(2) Port Facilities

Port LAKI

PORT LAKI, which is the most important of the harbours, contains the naval base.

It is classified as a "C" anchorage and could easily be defended since the harbour, on both the northern and southern shores, is flanked by high ground which commands both the approaches to and the whole of the inner harbour. The anchorage, which is well sheltered, is visible from seaward. The harbour, which is 16 cables long by 5 cables wide, with an entrance 24 cables wide, is suitable for a cruiser squadron and two capital ships with careful berthing.

112 **LERO***Quays, Piers and Breakwaters*

There are various piers, and these, for the convenience of easy reference have been lettered P.1 to P.14 on Plan 56. Piers 5, 6 and 8 do not appear in aerial photographs, and it may therefore be assumed that they do not exist. The pier at MERICA (P.1) is used for discharging war material and ammunition required for the area west of MERICA and for the dump at MERICA, and for embarking and disembarking men. Pier 2 is used for coaling. A pier just west of S. GIORGIO is T-shaped. It is used for the landing and embarkation of ships' crews, labourers who come and go from the northern shore and for loading and discharging cargoes from ships by means of the floating crane or lighters.

A breakwater is under construction at BRACHOS Point.

A quay at CROTIRACCIO enables vessels to get alongside for water.

In front of the naval headquarters at GONIA Cove there is an artificial port for M.A.S. Submarines anchor off the southern shore of Port LAKI Bay.

Floating Dock

A floating dock, lift 2,300 tons, and large enough to take a destroyer, is moored off S. GIORGIO in Port LAKI. This dock was reported as having been destroyed in an air raid. The presence of another floating dock, capable of docking two submarines, was reported in 1939, but has not been confirmed.

Lifting Appliances

A 25-30 ton crane exists on the pier (P.10) situated near MALISSA Point, just west of LEPETHA seaplane station.

There is a 50-70 ton crane on the end of the pier (P.1) situated on the northern shore in the vicinity of the underground magazines. There is also a floating crane (No. G.A. 219).

One floating crane, stationed at S. GIORGIO. This is used for loading and unloading engines at the factory.

One sheer lighter to lift 10-15 tons. It is being used for breakwater building.

Two small sheer lighters to lift 2-3 tons with no power.

Harbour Craft

The following harbour craft are believed to exist:—

Five tugs of about 50-60 tons.

Two M.Ls.

About twenty armed trawlers and tugs, and twenty-five lighters.

One small minesweeper.

Two or three fast motor boats, armed with machine-guns, for communication between the seaplane base and naval headquarters.

Two or three old steamboats and motor launches, including a boat with diving gear.

One water-tank vessel.

A number of pontoons capable of carrying troops.

About fifty caiques have been requisitioned.

S. GIORGIO:—Here is an important small base for the repair of ships; there are a number of workshops on shore. About 20 lighters are usually moored between the shore at S. GIORGIO and the Dock.

ALINDA BAY

Is situated north-west of PANALE Bay. It affords anchorage in depths of 10 to 18 fathoms but is exposed to easterly winds. The shores of the bay are skirted by rocks in places.

The port of AGIA MARINA lies on the southern shore of the bay. This port serves the town of LERO; guns and military stores are also off-loaded here.

There is a short mole about 100 ft. long extending north-west to the 3-fathom line from the north of the town, and a jetty about 150 ft. long extending into deeper water about 300 yards farther north.

PARTHANI Bay, situated at the north-west end of LERO, extends three-quarters of a mile south-east and has anchoring depths throughout.

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PARTHANI Bay, situated at the north-west end of LERO, extends three-quarters of a mile south-east and has anchoring depths throughout.

It becomes narrow at its head and terminates in a basin called AGIA MATRONA with a depth of 3 fathoms in it.

It is used as an anchorage for M.A.S.

General Lay-out

There are no floating docks, slipways or hangars in PORTO di RINA, PARTHANI Bay. The roadstead south-west of PORTO di RINA has been filled in with earth and a jetty has been built.

The jetty is used for the discharge of all material arriving for the requirements of the area and, for landing and embarking men, wooden jetties have been constructed.

PANALE Bay is situated on the southern side of the promontory on which the towns of LERO and AGIA MARINA stand.

It affords shelter to small vessels from northerly winds.

THREMONA Bay is situated in the middle of the western side of LERO and extends more than half-way into the island. The foreshore is generally precipitous and fronted with rocks, but there is a beach at the head of the bay.

LERO 113

(3) The Town

The Italian Government has taken over most of the houses and buildings at LAKI and also in the various villages where there is plenty of billeting accommodation for general military purposes. The population, which consists of Greeks, has been removed from certain of the important defensive areas. Increased taxes have also been imposed and restrictions placed upon the population in the interests of secrecy.

The water supply, which comes from S. THEOLOGOS, is said to be good; in addition most houses have their own well. It would, however, be necessary to purify all water required for drinking purposes. There is believed to be a reservoir in the vicinity of S. MARINA with a pipe line to the seaplane station. Water also has to be imported by steamer from KOS and KALIMNO. This may be necessary on account of imported labour. There are, in normal times, three water carriers engaged on this work.

Some recent improvement to the water supply includes a pipe line system which has been completed from SYKIA (SYCAMNIA). Water is pumped from SYKIA to the water tank at S. THEOLOGOS by this means.

It is not known whether this has entirely done away with the necessity of importing water.

There is a post office at LAKI, and telephone communication exists between all the important naval establishments.

Some sheds and tents in the lower part of the town, which were originally used as barracks, have now been removed—a fact which suggests that ample barrack accommodation is now completed.

(4) Government Establishments*Camouflage*

Use is made of camouflage on all Government buildings and establishments.

The Italians try to imitate the natural characteristics of the surrounding country. For example, they build houses, etc., of stones taken from rocks found in the area, and colour them according to the shade of earth found there. They also plant carob beans and other trees which grow in the area, as well as certain bushes which are known on the island as "Sparto." These bushes are used to camouflage stores and batteries.

Naval Headquarters

The naval headquarters are at GONIA Cove; most of the military and naval forces on the island are quartered in this area.

*GONIA Cove**General Lay-out.*

The general lay-out around the naval headquarters is as follows:—

To the west of the headquarters there is a large long-shaped store which contains reserve guns and stores of ammunition for various types of arms. To the west again, and near the shore is a large building, which is the naval officers' quarters, and behind this is a car park and garage for fifty motor cars. The most easily recognizable of the buildings face the sea opposite the main pier and have the appearance, from the air, of two inverted L's.

Behind the headquarters is an open square—used for public ceremonies, a club and messes for N.C.Os. Behind that again are a cinema, officers' mess and club, and further inland another building used by naval officers. Officers' villas are sited on a hill overlooking the establishments.

Inshore and to the east of the headquarters there are barracks and messes for naval ratings.

Barracks

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Inshore and to the east of the headquarters there are barracks and messes for naval ratings.

Barracks

Barracks, hutments and camps for troops have been located as follows:—

*LERO Town Near the Greek Orthodox Church: Barracks for 2,000 men.
M. MERA VIGLIA A number of huts in the valley to the west; also an encampment.

GURNA	In THREMONA Bay: West coast.
BLEFUTI	In BLEFUTI Bay: North coast.
PANDELI	North-west point in PANDELI Bay.
VROMOLITHOS	A small place on the shore south of PANDELI.
DRIMONA	Bay of GURNA.
S. QUIROCO	Near ALINDA Bay—also stabling and forage stores for 1,000 mules.
S. MARINA	ALINDA Bay.
S. QUARANTA	ALINDA Bay.
AGHIA SARANDA	ALINDA Bay.

(C46758)

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M. CONDRIDA	..	Air Force barracks : ? position.
M. CLIDI	..	In valley at foot of CRIFO Hill.
S. GIORGIO	..	Near and behind a factory : consists of two buildings in which are housed engineers from the factory and crews of submarines. Both buildings are surrounded with barbed wire.
CEFALU	..	West of M. SAN PIETRO : for marines.
M. CAZZUNI	..	450 yards north-east from the O.P. on M. CAZZUNI.
S. THEOLOGOS	..	Near the W/T station.
LEPETHA COVE	..	Three buildings for Air Force personnel attached to the sea-plane base.
PARTHANI	..	200 yards south of the mine stores.
GONIA COVE (i)	..	Naval barracks.
GONIA COVE (ii)	..	Sited about 300 yards north-north-west of the naval barracks and south of the road leading to M. Della PALMA : large military barracks.
*MERICCI	..	Between ZEPHYROS Point and S. SPIRITO : Barracks.
M. SAN PIETRO	..	At the foot of the hill housing two battalions, subterranean galleries link up with Port LAKI and the foothills of M. RACHI.

The total barracks accommodation is reputed to be capable of housing 40,000 men.

Food Stores

- (i) Near the little church of S. LIBERIO, which stands about half-way along the road from ALINDA to PARTHANI and exactly at the beginning of the small plain, there are five warehouses ; floor space 1,600 square feet. These stores contain wheat, flour, macaroni, beans and tinned food. They are visible from the south-eastern extremity of the plain.
- (ii) At GONIA, behind the first building of the naval base, there is a large food store.
- (iii) At the CASTI flour mill, which stands off the shore near CASTEL di BRONZI, there are stores of wheat and flour.

Hospitals

Hospitals have been located as follows :—

S. MARINA	..	ALINDA Bay, on the quay near the Custom House, naval hospital.
M. CONTRIDA	..	A hospital with 120 beds : ? position.
PARTHANI	..	Military : 90 beds. The hospital is sited in a large garden.
S. GIORGIO	..	Near the barracks.
LEPETHA	..	Near the sea shore, west of the seaplane base, Air Force hospital.
GONIA COVE	..	To the north-west of the Naval Headquarters.

Police

There are reported to be about eighty police and customs officials in the area of LAKI harbour.

Fuel : Fuel Storage

(a) Oil and petrol.

Provision has been made for the storage of considerable stocks of oil and petrol :—

(a) S. GIORGIO	..	..	Three partially underground tanks in the hills to the west of S. GIORGIO, about 1,000 yards east of ANGISTRO Point, for petrol and oil ; above these tanks there is a hedge forming the letters R.V.
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(b) CASTEL di BRONZI	..	Petrol tanks.
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(c) MERICCI	..	Petrol tanks.
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CASTEL di BRONZI	..	Petrol tanks.
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(b) CASTEL di BRONZI ..	..	Petrol tanks.
(c) MERICCI ..	..	Petrol tanks.
(d) GONIA Cove ..	..	Petrol tanks.
(e) LEPETHA Cove ..	..	Petrol tanks for fuelling seaplanes sited behind the seaplane hangars, in an excavation above these tanks there is a hedge forming the letter F. There is another dump 200 yards to the westward.
(f) PARTHANI ..	..	Petrol tanks for fuelling seaplanes.
(g) M. CONTRIDA ..	..	Petrol stores: ? position.

(b) Coal.

KOULOULI.

GONIA ..

MERICCI ..

MALISSA Point ..

Near naval base.
Between MERICCI Pier and MERICCI, supplies for ships are taken from this dump.
To the south-west, at the eastern point of S. GIORGIO, a triangular clearing cut out of the hillside is said to be a coal dump.

LERO 115

(5) Commercial Establishments

There is a tobacco factory at TEMANIA Bay where cigarettes, which represent the only export of any value from the island, are made.

On the south shore of TEMANIA Bay there is a factory which produces aerated beverages.

On the promontory south of TEMANIA Bay there is a brewery and a cold storage establishment.

(6) Aircraft Factories

None.

(7) Air Facilities

Seaplane Stations

(a) *LEPETHA*.—The air forces of the island, the personnel of which is reported to consist of about 600 men, are at present mostly concentrated at *LEPETHA* (*LEPIDA*) seaplane station: Position: Lat. $37^{\circ} 06' 55''$ N., Long. $26^{\circ} 51' 50''$ E. This station, which includes accommodation for the air force personnel, has been completely enclosed by a 15-ft. wall. There are three hangars for seaplanes, one of which is built into the side of a hill, one is very large, able to take 40 aircraft in all. The centre hangar contains seaplane bombers. The dimensions of the smaller are 660 by 250 ft., these are situated at the shore end of the three slipways. Two of these are equipped with electric winches and there is a hand-worked capstan and two small buoys. Each hangar is fitted with a searchlight, the object of which is to assist seaplanes going out of and returning to their respective hangars. There is a powerful searchlight situated at the head of Port LAKI to illuminate the port for the landing of seaplanes at night. The workshops are capable of carrying out any kind of repair, including the production of all machine spare parts. Prevailing winds north-east in summer, south-west in winter. * Seaplanes are operated from S. MARINA and PARTHANI, where there are small stations.

LEPETHA Area: General Lay-out.—Immediately to the east of this seaplane base there is a public hall, used for ceremonies, etc., a restaurant and officers' quarters, a clump of trees comes next, and after that a gymnasium, near which is a building which houses the headquarters of seaplane units stationed on the island. West of this point there are two large barracks for Air Force personnel. The Air Commander's house is near these barracks in a garden and nearby is a football ground and munition store and power station.

In front of these barracks, close to the seashore, there is a big hospital and, to the west, some more barracks for N.C.O.s, belonging to seaplane units.

Between the barracks and the hospital there is the small chapel of S. GIORGIO. Behind the seaplane hangars there is an excavation which is used for storage of petrol for seaplanes. Petrol from this store is pumped underground to tanks from which seaplanes are fuelled.

(b) *PARTHANI Bay*.—A seaplane alighting area, which adjoins the landing ground of PARTHANI Bay Aerodrome: position, Lat. $37^{\circ} 11' 15''$ N., Long. $26^{\circ} 48' 15''$ E.

Aerodromes

PARTHANI Plain.

There is an aerodrome on the south shore of PARTHANI Bay, in position Lat. $37^{\circ} 10' 50''$ N., Long. $26^{\circ} 48' 15''$ E. Buildings have been erected on the north side of the landing grounds. The runway is 130 ft. wide and lies north/south. The landing ground is 750 by 200 yards.

† SEROCAMPO An aerodrome has been reported.

† LEPETHA Sited south-west of the seaplane station.

† The existence of these aerodromes is very doubtful and no reports on them being in use

of about 600 men, are at present mostly concentrated at LEPETHA (LEPIDAY) seaplane station: Position: Lat. 37° 06' 55" N., Long. 26° 51' 50" E. This station, which includes accommodation for the air force personnel, has been completely enclosed by a 15-ft. wall. There are three hangars for seaplanes, one of which is built into the side of a hill, one is very large, able to take 40 aircraft in all. The centre hangar contains seaplane bombers. The dimensions of the smaller are 660 by 250 ft., these are situated at the shore end of the three slipways. Two of these are equipped with electric winches and there is a hand-worked capstan and two small buoys. Each hangar is fitted with a searchlight, the object of which is to assist seaplanes going out of and returning to their respective hangars. There is a powerful searchlight situated at the head of Port LAKI to illuminate the port for the landing of seaplanes at night. The workshops are capable of carrying out any kind of repair, including the production of all machine spare parts. Prevailing winds north-east in summer, south-west in winter. * Seaplanes are operated from S. MARINA and PARTHANI, where there are small stations.

LEPETHA Area: General Lay-out.—Immediately to the east of this seaplane base there is a public hall, used for ceremonies, etc., a restaurant and officers' quarters, a clump of trees comes next, and after that a gymnasium, near which is a building which houses the headquarters of seaplane units stationed on the island. West of this point there are two large barracks for Air Force personnel. The Air Commander's house is near these barracks in a garden and nearby is a football ground and munition store and power station.

In front of these barracks, close to the seashore, there is a big hospital and, to the west, some more barracks for N.C.O.s, belonging to seaplane units.

Between the barracks and the hospital there is the small chapel of S. GIORGIO. Behind the seaplane hangars there is an excavation which is used for storage of petrol for seaplanes. Petrol from this store is pumped underground to tanks from which seaplanes are fuelled.

(b) **PARTHANI Bay.**—A seaplane alighting area, which adjoins the landing ground of PARTHANI Bay Aerodrome: position, Lat. 37° 11' 15" N., Long. 26° 48' 15" E.

Aerodromes

PARTHANI Plain.

There is an aerodrome on the south shore of PARTHANI Bay, in position Lat. 37° 10' 50" N., Long. 26° 48' 15" E. Buildings have been erected on the north side of the landing grounds. The runway is 130 ft. wide and lies north/south. The landing ground is 750 by 200 yards.

† SEROCAMPO An aerodrome has been reported.

† LEPETHA Sited south-west of the seaplane station.

† The existence of these aerodromes is very doubtful and no reports on them being in use are acceptable.

(8) War Material Factories

(a) Seaplane Assembly Factory

A large factory for the assembly of seaplanes and for the repair of their engines, and accessories for ships, stands close to the shore at S. GIORGIO.

To the east of the above there is a smaller similar factory which deals with the construction and repairs of spare parts. The factories are surrounded by barbed wire.

(b) Machine Shops for Submarines

There are also two machine shops serving the requirements of submarines.

(c) Mine-filling Factory

Situated near the roadstead south-west of PORTO di RINA there is a large factory for filling mines, a large number of empty mines lie about outside.

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(9) Power Plants

(i) MALISSA Point

Sited about 500 yards west-south-west of the seaplane hangars, on the coast. This is probably the main power station for the whole island; part or all of this may be underground.

(ii) * M. SCUMBARDO

Underground electrical plant is installed on M. SCUMBARDO.

(iii) GONIA Cove

(iv) * M. della PALMA

Sited south of a loop in the road from LAKI to the mountain. It is possible that this building is a W/T station.

(v) Water

There is a Water Works and Pumping Station east of the LEPEIRA Football ground.

(10) Transport Facilities

(a) Railways

There is a Decauville railway which passes through galleries from LAKI to CASTRO and M. SAN PIETRO: junction in THREMONA Bay. The total length of the railway is about 3 miles and is used for the transport of stores, etc.

(b) Roads

The roads on the island are known to be sufficient for the needs of defence and include:—

(i) PARTHANI-BUONAFONTE-S. QUIRICO-BLEFUTI village.

(ii) PARTHANI-M. MARCELLO-M. CALOGERO-M. RACHI.

(iii) PARTHANI-M. SAN GIOVANNI.

(iv) PARTHANI-south-east through the valley to M. KACHI-S. IRENE-PORTA VECCHIA to:—

(a) PORT LAKI.

(b) PANDELI-LERO Town-PATRIARCATO-S. MARINA.

(c) VIGLA ZIGADA PASCIA-SEROCAMPO-PT. DIAPORI-M. VIGLA-PORTA VECCHIA.

The above roads, which link up the main tactical points with headquarters, are shown on Plans No. 56 and 68.

Important roads are asphalted, minor roads are built of pebbles and filled in with tar or sand. All roads and bridges are strongly built and in good condition.

Sea

The motor caique "Kassos," manned by marines, carries food and munitions between LERO and KALIMNO.

(11) Signal Communications

Cables

To KALIMNO, KOS, RHODES and PATMOS. There is a cable hut on the north-east shore of SEROCAMPO. There is telegraphic communication between LERO Town and PORT LAKI.

W/T Stations

There are W/T stations at:—

(a) PORT LAKI: GONIA Cove.

(b) Near S. GIOVANNI.

(c) M. TORTORE.

(a) *Railways*

There is a Decauville railway which passes through galleries from LAKI to CASTRO and M. SAN PIETRO : junction in THREMONA Bay. The total length of the railway is about 3 miles and is used for the transport of stores, etc.

(b) *Roads*

The roads on the island are known to be sufficient for the needs of defence and include :—

- (i) PARTHANI-BUONAFONTE-S. QUIRICO-BLEFUTI village.
- (ii) PARTHANI-M. MARCELLO-M. CALOGERO-M. RACHI.
- (iii) PARTHANI-M. SAN GIOVANNI.
- (iv) PARTHANI-south-east through the valley to M. RACHI-S. IRENE-PORTA VECCHIA to :—

- (a) PORT LAKI.
- (b) PANDELI-LERO Town-PATRIARCATO-S. MARINA.
- (c) VIGLA ZIGADA PASCLA-SEROCAMPO-PT. DIAPORI-M. VIGLA-PORTA VECCHIA.

The above roads, which link up the main tactical points with headquarters, are shown on Plans No. 56 and 68.

Important roads are asphalted, minor roads are built of pebbles and filled in with tar or sand. All roads and bridges are strongly built and in good condition.

Sea

The motor caique "Kassos," manned by marines, carries food and munitions between LERO and KALIMNO.

(11) *Signal Communications*

Cables

To KALIMNO, KOS, RHODES and PATMOS. There is a cable hut on the north-east shore of SEROCAMPO. There is telegraphic communication between LERO Town and PORT LAKI.

W/T Stations

There are W/T stations at :—

- (a) PORT LAKI : GONIA Cove.
- (b) Near S. GIOVANNI.
- (c) M. TORTORE.
- (d) S. NICOLA.
- (e) PT. MARCELLO.
- (f) PT. BRACHOS, 2 kw. (spark). A medium power station, situated some 700 yards north of the Point. This station is manned by naval ratings. * The set is believed to work mainly with RHODES on 600 and 800 metres, also with CATANIA Air Station on 1,950 metres C.W. Also S/W working on 35 metres with RHODES, TARANTO and BENGHAZI. Call sign I.Q.Q.?
- (g) A small W/T set near the seaplane station.
- * (h) PT. CORA : Radio-telephone station.
- * (i) BLEFUTI Bay : Radio-telephone station.
- * (j) S. QUIRICO : Radio-telephone station.
- * (k) Della PALMA Bay : Radio-telephone station.
- * (l) ALINDA Bay on the north shore : Radio-telephone station.
- (m) M. TORTORE : Radio-telephone station.

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Telegraph

The telegraph lines are shown on Plan No. 68 (approximate only). Overhead telegraph cables run from AGHIA MARINA to SEROCAMPO, whence they join a submerged cable which continues as far as RHODES. Five overhead cables meet at a point 100 yards north of CAZZUNI Point.

V/S Station

(i) On the high ground west of PARTHANI Bay.

(ii) PT. MARCELLO.

* (iii) PT. CORA.

* (iv) BLEFUTI Bay.

* (v) Della PALMA Bay.

D/F Station

At LEPETHA seaplane station.

Telephones

It is believed that the main points of the island are linked up by telephone. The seaplane station is in communication by L/T with the main W/T station, naval headquarters, and most probably with other establishments, including the various armament control headquarters.

Such telephone systems as are known are shown on Plan No. 68.

(12) Defences*(i) Sea Front Defences**(a) Coast Defence Batteries***COAST DEFENCE BATTERIES**

No. of Battery.	Name or Position and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	M. PATELLA—Lat. 37° 07' 20" N., Long. 26° 49' 25" E. S.E. of the battery is an O.P. and C.P.	4—4.7-in.	A.3	B.3	1942
2	M. CAZZUNI—Lat. 37° 06' 50" N., Long. 26° 49' 18" E. Mounted in four open circular emplacements on the edge of the cliff: 20 ft. diam.; 200 ft. apart; one emplacement in advance of the others.	4—? 6-in.	A.2	A.5	1942
3	LAKI Head—Lat. 37° 06' 35" N., Long. 26° 49' 40" E. Mounted in four open circular emplacements: 20 ft. diam.; Nos. 1 and 2, and 3 and 4, are 100 ft. apart; Nos. 2 and 3 are 180 ft. apart with an O.P. between them.	4—6-in.	A.2	A.3	1942
4	CAZZUNI Point—Lat. 37° 06' 37" N., Long. 26° 49' 50" E. Mounted in three open emplacements: 15 ft. diam.; 100 ft. apart.	3—3-in.	A.2	A.3	1942
5	ANGISTRO Point—Lat. 37° 06' 25" E., Long. 26° 50' 10" E.	2—4.7-in., 3—3-in. or 4-in.	A.2 A.2	A.5 A.5	1942
6	M. SCUMBARDO (West)—Lat. 37° 05' 30" N., Long. 26° 50' 10" E.	2—8-in. or 8-in.	A.2	A.5	1942

station is in communication by L/T with the main W/T station, naval headquarters, and most probably with other establishments, including the various armament control headquarters.

Such telephone systems as are known are shown on Plan No. 68.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

COAST DEFENCE BATTERIES

No. of Battery.	Name or Position and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	M. PATELLA—Lat. 37° 07' 20" N., Long. 26° 49' 25" E. S.E. of the battery is an O.P. and C.P.	4—4.7-in.	A.3	B.3	1942
2	M. CAZZUNI—Lat. 37° 06' 50" N., Long. 26° 49' 18" E. Mounted in four open circular emplacements on the edge of the cliff 20 ft. diam.; 200 ft. apart; one emplacement in advance of the others.	4—? 6-in.	A.2	A.5	1942
3	LAKI Head—Lat. 37° 06' 35" N., Long. 26° 49' 40" E. Mounted in four open circular emplacements; 20 ft. diam.; Nos. 1 and 2 and 3 and 4, are 100 ft. apart; Nos. 2 and 3 are 180 ft. apart with an O.P. between them.	4—6-in.	A.2	A.3	1942
4	CAZZUNI Point—Lat. 37° 06' 37" N., Long. 26° 49' 50" E. Mounted in three open emplacements; 15 ft. diam.; 100 ft. apart.	3—3-in.	A.2	A.3	1942
5	ANGISTRO Point—Lat. 37° 06' 25" E., Long. 26° 50' 10" E.	2—4.7-in., 3—3-in. or 4-in.	A.2 A.2	A.5 A.5	1942
6	M. SCUMBARDO (West)—Lat. 37° 05' 50" N., Long. 26° 51' 25" E. Two guns mounted on the edge of a cliff, probably in turrets, 20 ft. in diam., on circular platforms 30 ft. in diam., 250 ft. apart. Other guns may be present.	2—8-in. or 8.6-in. and ? 3—? cal.	A.2 A.5	A.5 —	1942 1942
7	M. SCUMBARDO (East)—Lat. 37° 06' 00" N., Long. 26° 51' 45" E. Mounted in open emplacements, 20 ft. diam.	4—? cal. H.A./L.A.	A.2	—	1942
8	DIAPORI Point—Lat. 37° 05' 45" N., Long. 26° 53' 28" E.	6—4-in.	A.2	A.3	1942
9	520 yards North of DIAPORI Point—Lat. 37° 06' 00" N., Long. 26° 53' 25" E. Mounted in emplacements, 20 ft. diam., irregularly spaced; four on the top of the hills and two slightly lower down on the east side.	6—? 6-in. or 8-in.	A.2	A.5	1942
10	M. TORTORE	3—4.7-in.	B.1	B.3	1941

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No. of Battery	Name or Position and Description	Armament	Grading		Date of Latest Report
			Position and No. of Guns	Calibre	
11	M. VIGLA—Lat. 37° 07' 57" N., Long. 26° 52' 07" E. Mounted in emplacements in line 20 ft. diam., 80 ft. apart.	2—6-in. and 4—4-in.	A.2	A.5	1942
12	M. APPETICI—Lat. 37° 09' 03" N., Long. 26° 52' 30" E. Mounted in open circular emplacements; 25 ft. diam., 240 ft. apart; two on the top of the hill and two slightly lower down on the East side.	4—8.5-in.	A.2	A.5	1942
13	IL CASTELLO	4—6-in.	B.2	C.3	1941
14	CASTEL di BRONZI	2—4-in.	B.1	B.3	1941
15	S. QUIRICO	2—2 cal. (light)	B.1	B.3	1941
16	N. Shore of ALINDA BAY	6—7 cal. (light)	B.1	B.1	1940
17	M. CLIDI—Lat. 37° 10' 27" N., Long. 26° 50' 18" E. There is a road leading to the top of the hill. It is possible that reports of this battery may refer to A.A. Battery No. 18.	3—7 11-in.	C.3 E.D. E.D.	C.5	1942
18	Eastern entrance to BLEFUTI Bay—Lat. 37° 31' 25" N., Long. 26° 49' 50" E.	4—4-in.	B.1	B.3	1942
19	M. VIGLA	1—6-in. 4—4-in.	B.1	B.3	1941
20	S. CHIARA	8—4-in.	B.1	B.3	1942
21	SEGNAL—Lat. 37° 11' 35" N., Long. 26° 48' 20" E.	? No. and calibre (light). 5—7 cal. (light).	B.1	B.3	1942
22	P. CORA	4—4-in.	C.1	C.3	1940
23	ARKHANGELOS Island (North)	4—4-in.	B.1	E.3	1940
24	ARKHANGELOS Island: Rud di MULINO: Lat. 36° 12' 00" N., Long. 26° 46' 35" E. Mounted in open emplacements.	4—7 cal. (light)	A.2	A.3	1942
25	ARKHANGELOS Island (South)	4—4-in.	B.1	B.3	1941
26	South-West of C. TIMARI: Lat. 37° 11' 23" N., Long. 26° 47' 00" N.	4—4-in.	A.2	A.3	1942
27	North-West of M. S. GIOVANNI FACUDIA: Lat. 37° 11' 07" N., Long. 26° 46' 47" E.	? No. and Cal. (light)	A.3	A.3	1942
28	M. MARCELLO: Lat. 37° 10' 15" N., Long. 26° 46' 50" E. Mounted in open circular emplacements, 25 ft. diam., on the West side of the mountain top. No. 1 is 270 ft. from No. 2, Nos. 2, 3 and 4 are 180 ft. apart; No. 3 is 75 ft. in	4—12-in.	A.2	B.3	1942

14	CASTEL di BRONZI	2-4-in.	B.1	B.3	1941
15	S. QEURICO	2-? cal. (light).	B.1	B.3	1941
16	N. Shore of ALINDA BAY	6-? cal. (light).	B.1	B.1	1940
17	M. CLIDI—Lat. 37° 10' 27" N., Long. 26° 50' 18" E. There is a road leading to the top of the hill. It is possible that reports of this battery may refer to A.A. Battery No. 18.	3-? 11-in. (light).	C.3 F.D. P.D.	C.5	1942
18	Eastern entrance to BLEFUTI Bay— Lat. 37° 31' 25" N., Long. 26° 49' 50" E.	4-4-in.	B.1	B.3	1942
19	M. VIGLA	1-6-in. 4-4-in.	B.1	B.3	1941
20	S. CHIARA	8-4-in.	B.1	B.3	1942
21	SEGNALE—Lat. 37° 11' 35" N., Long. 26° 48' 20" E.	? No. and calibre (light).	B.1	B.3	1942
22	P. CORA	5-? cal. (light).	C.1	C.3	1940
23	ARKHANGELOS Island (North)	4-4-in.	B.1	B.3	1940
24	ARKHANGELOS Island: Rad. di MULINO: Lat. 36° 12' 00" N., Long. 26° 46' 35" E. Mounted in open em- placements.	4-? cal. (light)	A.2	A.3	1942
25	ARKHANGELOS Island (South)	4-4-in.	B.1	B.3	1941
26	South-West of C. TIMARI: Lat. 37° 11' 23" N., Long. 26° 47' 00" N.	4-4-in.	A.2	A.3	1942
27	North-West of M. S. GIOVANNI FACUDIA: Lat. 37° 11' 07" N., Long. 26° 46' 47" E.	? No. and Cal. (light)	A.3	A.3	1942
28	M. MARCELLO: Lat. 37° 10' 15" N., Long. 26° 46' 50" E. Mounted in open circular emplacements, 25 ft. diam.: on the West side of the mountain top. No. 1 is 270 ft. from No. 2. Nos. 2, 3 and 4 are 180 ft. apart; No. 3 is 75 ft. in advance of Nos. 2 and 4.	4-12-in.	A.2	B.3	1942
29	M. CALOGERO: Lat. 37° 09' 55" N., Long. 26° 47' 50" E. Mounted in open circular emplacements 20 ft. diam. Nos. 1 and 2 and Nos. 3 and 4 are 100 ft. apart, Nos. 2 and 3 are 185 ft. apart with an empty emplacement, possibly an O.P. between them. All are on the West of the ridge, No. 4 being slightly in advance of the other three.	4-? 6-in.	A.2	B.3	1942
30	M. S. PIETRO	4-6-in.	A.3	B.3	1942

There is no information available regarding the range of any of the guns.
It is reported that battery positions are protected by electrified wire.

(d) *Command Posts*.—Their central command post is reported to be in the near vicinity of S. Chiava (Bair di Blefuni), while local command posts exist in each of the main armament areas.

(e) *Local Defences*.—At all points on the island where the Italians consider landing is possible there are wire entanglements and machine-gun posts.

Most of the wire has been concealed from the sea by bushes. There are three lines of barbed wire in front of trenches.

These defences have been located as follows :—

Port LAKI : the whole of the foreshore.

PT. ANGISTRO : south-eastward for 500 yards.

PT. SCUMBARDI to PT. DIAPORI, including SEROCAMPO Bay.

PT. del TURCO to PANDELI.

M. APPETICI : all round the mountain.

ALINDA Bay.

BLEFUTI Bay.

THREMONA Bay from S. ISIDORO to S. GIORGIO.

PARTHANI Bay : at various points around the bay.

(g) *Magazines*.—Magazines, ammunition stores or dumps exist as follows :—

(i) MERICCI is the main supply centre for all armaments.

This consists of a large group of ammunition dumps situated immediately east of MERICCI on the northern shore of PORT LAKI.

These dumps are covered by iron beams on which are laid thick layers of concrete blocks, and on top of that a thick layer of earth ; only the entrances are visible from the sea shore. Ammunition, and especially shells, are stored in these dumps.

(ii) M. APPETICI.

(iii) M. PATELLA.

(iv) M. TORTORE (PANAGHIA KASTRON).

(v) S. IRENE (south-west of LERO).

(vi) M. MARCELLO.

(vii) M. SCUMBARDI.

(viii) S. GIORGIO. Here there is also a stock of torpedoes in two hangars.

(ix) PORT LAKI.

(x) PARTHANI Bay. Two buildings above ground ; mines and shells are fitted in them. Adjacent is another small explosive store.

(xi) STAVRI.

(xii) C. CONISMA. War material of all sorts.

(xiii) S. SPIRITO : six large buildings used as munition depôts.

(xiv) M. CONDRIDA. ? position.

(xv) M. CLIDI : on the left of the carriage road from PARTHENI to M. CLIDI, in the valley of DIENI in a gallery leading to the summit of M. CLIDI.

(xvi) TIMARI, on the plain behind the gulf a supply dump and a gas bomb depôt.

(xvii) S. MARINA : munitions depôt.

ALINDA Bay.

BLEFUTI Bay.

THREMONA Bay from S. ISIDORO to S. GIORGIO.

PARTHANI Bay: at various points around the bay.

(g) *Magazines*.—Magazines, ammunition stores or dumps exist as follows:—

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(ii) M. APPETICI.

(iii) M. PATELLA.

(iv) M. TORTORE (PANAGHIA KASTRON).

(v) S. IRENE (south-west of LERO).

(vi) M. MARCELLO.

(vii) M. SCUMBARDO.

(viii) S. GIORGIO. Here there is also a stock of torpedoes in two hangars.

(ix) PORT LAKI.

(x) PARTHANI Bay. Two buildings above ground; mines and shells are fitted in them. Adjacent is another small explosive store.

(xi) STAVRI.

(xii) C. CONISMA. War material of all sorts.

(xiii) S. SPIRITO: six large buildings used as munition depôts.

(xiv) M. CONDRIDA. ? position.

(xv) M. CLIDI: on the left of the carriage road from PARTHENI to M. CLIDI, in the valley of DIENI in a gallery leading to the summit of M. CLIDI.

(xvi) TIMARI, on the plain behind the gulf a supply dump and a gas bomb depôt.

(xvii) S. MARINA: munitions depôt.

(xviii) SEROCAMPO.

All of these are underground except when otherwise stated; at all gun positions shells and ammunition are stored underground.

Observation Posts.—Observation posts are situated as follows:—

(i) CASTEL di BRONZI, near Custom House in ALINDA BAY: a concrete tower 18 ft. high.

(ii) M. MARCELLO.

(iii) M. SCUMBARDO.

(iv) M. VIGLA (east of Port LAKI).

(v) M. CLIDI.

(vi) M. CAZZUNI.

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(ii) *Movable Armament.*—See Dodecanese—General.

(iii) *Searchlights.*—Searchlights have been reported at all fortified places; they have actually been located as follows:—

- (a) C. CORA.
- (b) I. di FARADO.
- (c) LAKI HEAD.
- (d) M. CASTELLO.
- (e) M. CLIDI.
- (f) M. MARCELLO.
- (g) M. MERAVIGLIA.
- (h) PROFETA ELIA.
- (i) M. VEDETTA.
- (j) M. ZUNCONA.
- (k) PT. AGISTRO.
- (l) M. PATELLA.
- (m) M. SCUMBARDO.
- (n) PT. DIAPORI.

(iv) *Local Seaward Defences.* : (a) *Minefields.*—Mines have been laid as follows:—

- (i) PORT LAKI : 300 yards outside the boom defence; the position of this minefield is indicated by buoys.
- (ii) PORT LAKI : inside the harbour to the east of the boom, between PT. ANGISTRO and the pier to the west of S. GIORGIO, on the south shore, and between P. CAZZUNI and GONIA Cove on the north shore.
- (iii) On the east coast : from the entrance to the port of AGHIA MARINA, southwards, to C. DIAPORI at a distance of 1 mile from the coast.
- (iv) On the east coast : from the entrance to the port of AGHIA MARINA, northwards, to the port of BLEFUTI.
- (v) Between the north-west side of LERO and ARCHANGELOS Island, closing both entrances to PARTHANI Bay.
- (vi) In the waters round the small islands situated between LERO and PATMOS.

(b) *Torpedo Batteries.*—Torpedo tubes exist at each side of the entrance to:—

- (a) Port LAKI.
- (b) GURNA Bay.
- (c) PARTHANI Bay.
- (d) ALINDA Bay.

Both 18-in. and 21-in. torpedoes have been sent from NAPLES for use with these batteries. Torpedo firing gear has been installed in the tunnel between CAZZUNI and MERICCI.

(c) *Booms and Nets.*—An A/S boom is placed in position from PT. CAZZUNI to PT. ANGISTRO (entrance to Port LAKI). There is a gate on the CAZZUNI side 40 ft. wide.

Booms exist in the PARTHANI Bay area as follows:—

- (g) M. ZUNCONA.
- (h) PT. AGISTRO.
- (i) M. PATELLA.
- (m) M. SCUMBARD.
- (n) PT. DIAPORI.

(iv) *Local Seaward Defences* : (a) *Minefields*.—Mines have been laid as follows :—

- (i) PORT LAKI : 300 yards outside the boom defence ; the position of this minefield is indicated by buoys.
- (ii) PORT LAKI : inside the harbour to the east of the boom, between PT. ANGISTRO and the pier to the west of S. GIORGIO, on the south shore, and between P. CAZZUNI and GONIA Cove on the north shore.
- (iii) On the east coast : from the entrance to the port of AGHIA MARINA, southwards, to C. DIAPORI at a distance of 1 mile from the coast.
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- (v) Between the north-west side of LERO and ARCHANGELOS Island, closing both entrances to PARTHANI Bay.
- (vi) In the waters round the small islands situated between LERO and PATMOS.

(b) *Torpedo Batteries*.—Torpedo tubes exist at each side of the entrance to :—

- (a) Port LAKI.
- (b) GURNA Bay.
- (c) PARTHANI Bay.
- (d) ALINDA Bay.

Both 18-in. and 21-in. torpedoes have been sent from NAPLES for use with these batteries. Torpedo firing gear has been installed in the tunnel between CAZZUNI and MERICCI.

(c) *Booms and Nets*.—An A/S boom is placed in position from PT. CAZZUNI to PT. ANGISTRO (entrance to Port LAKI). There is a gate on the CAZZUNI side 40 ft. wide.

Booms exist in the PARTHANI Bay area as follows :—

- (i) C. TIMARI to the nearest point on ARCHANGELOS Island.
- (ii) PT. CORA to the nearest point on ARCHANGELOS Island.

There is an A/S net 1,000 yards south-west of C. TIMARI boom.

Hydrophones.—The sound apparatus for locating submarines is at AYIOS NIKOLAS.

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(v) Local Air Defences: (a) A.A. Batteries.

Battery No.	Name or Location.	Armament.	Grading.	Date of Latest Report.
A.A.1	C. CONISMA (1)	? No. and calibre (light)	A.2	1942
A.A.2	C. CONISMA (2)	? No. and calibre	B.2	1941
A.A.3	M. CASTELLO	4-3-9-in.	B.2	1941
A.A.4	M. PATELLA	? No. and calibre	B.2	1941
A.A.5	CAZZUNI Point	? No. and calibre (heavy)	A.2	1941
A.A.6	MERICCIA (North of)	? No. and calibre	B.2	1941
A.A.7	BRACHOS Point	3 pom-poms	A.2	1941
A.A.8	TEMENIA (West of S. POLI-CARPO).	3-? calibre (light)	A.2	1942
A.A.9	LEPETHA COVE	? No. and calibre (light)	A.2	1941
A.A.10	MALISSA Point	? No. of pom-poms	A.2	1942
A.A.11	S. GIORGIO	? No. of pom-poms	A.2	1941
A.A.12	ANGISTRO Point	2-? calibre (heavy)	A.2	1941
A.A.13	CUCULO	? No. of pom-poms	A.2	1941
A.A.14	M. PLANA	? 8-3-9-in.	B.2	1941
A.A.15	M. SCUMBARDO	4-3-9-in.	B.2	1941
A.A.16	LA MADONNA	4-? calibre (light)	A.2	1942
A.A.17	DIAPORI Point	? No. and calibre	B.2	1941
A.A.18	800 yards N. by W. of DIA-PORI Point	4-? calibre	A.2	1942
A.A.19	M. TORTORE	2-3-9-in.	B.2	1941
A.A.20	M. ZUNCONA	4-? calibre (light)	A.2	1942
A.A.21	M. VIGLA	8-3-9-in.	B.2	1941
A.A.22	M. PROFETA ELIA	4-3-9-in.	B.2	1941
A.A.23	M. MERAVIGLIA	6-3-9-in.	A.2	1942
A.A.24	M. APPETICI	4-3-9-in.	B.2	1941
A.A.25	LERO Town	? No. and calibre	B.2	1941
A.A.26	IL CASTELLO	4-3-in.	C.3	1940
A.A.27	M. RACHI	4-3-9-in.	A.2	1942
A.A.28	S. QUIRICO	2-3-9-in.	B.2	1941
A.A.29	M. CLIDI	? No. and calibre	B.2	1941
A.A.30	M. VEDETTA, Hill 228	? No. and calibre	B.2	1941
A.A.31	M. VEDETTA, Hill 264, top	? No. and calibre	B.2	1941
A.A.32	M. VEDETTA, Hill 264, North lower slopes.	? No. and calibre	C.3	1940
A.A.33	M. VEDETTA, Hill 264, North-west lower slopes.	? No. and calibre	B.2	1941
A.A.34	della PALMA Bay	? No. and calibre	C.3	1940
A.A.35	M. VIGLA, Hill 208	10-? calibre	B.2	1941
A.A.36	BLEFUTI Bay	? No.-3-in.	C.3	1940
A.A.37	PORTO di RINA (South-south-east of).	? No. and calibre	C.3	1940
A.A.38	PORTO di RINA (South-east of)	4-? calibre	B.2	1941
A.A.39	PORTO di RINA (North-east of)	3-? calibre	B.2	1940
A.A.40	PORTO di RINA (North-west point)	? No. and calibre	B.2	1941
A.A.41	PORTO di RINA (South-west point)	? No. and calibre	B.2	1941
A.A.42	M.S. GIOVANNI FACUDA (North-west side)	6-? calibre (light)	A.2	1942
A.A.43	M. MARCELLO (North-west slopes of)	3-3-9-in.	A.2	1942
A.A.44	M. MARCELLO (Southern slopes of)	3-3-9-in.	B.2	1941
A.A.45	M. MARCELLO (Eastern slopes of)	2-? calibre	B.2	1941
A.A.46	M. CALOGERO, Hill 284, (Eastern slopes of)	? No. and calibre	B.2	1941
A.A.47	M. CONDRIDA (Western		B.2	

Note.—There is reason to believe that many of the above A. A. batteries are mobile.

(b) *A.A. Searchlights and Sound Locators*.—A considerable number of A.A. searchlights exist all over the island. Four have been located on the south shore of Porto di RINA; two of them are on the roof of an ammunition store, others are at C. CONISMA. Sound locators for aircraft have been installed at Port LAKI.

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(vii) *Chemical Warfare*.—Operations, including the use of smoke screens, have been practised. On such occasions Port LAKI harbour has been completely enveloped in smoke.

(viii) *Garrison*.—A total of about 6,000 troops in all.

The normal air force stationed at LERO is No. 92 Wing, consisting of:—

No. 161 Squadron (sea fighter).

No. 185 Squadron (sea reconnaissance).

No. 200 Squadron (sea bomber).

No. 201 (sea bomber).

(13) Reconnaissance

All beaches must be considered as defended even where there is no definite information of defences.

Most of the beaches are under range of coast defence batteries and are protected by wire and machine-gun nests.

Strategical

An examination of the position of this island, surrounded as it is with a mass of other islands, and in view of the narrowness of the approaches to which an invading force would be confined from all directions, discloses the fact that there would be little chance of effecting strategical surprise.

Tactical

On the other hand, notwithstanding the smallness of the island, the difficult terrain and the lack of adequate system of road communications renders tactical surprise a reasonable possibility.

Seafront Defences

If in fact the primary armament does consist of 15-in. guns, the reduction of these defences would in all probability entail the employment of capital ships owing to the range which those guns may be expected to attain. Since care has been taken to conceal these defences as far as possible from seaward, their destruction would be rendered very difficult unless aircraft spotting was available.

Landing Places. (See Plan No. 68)

In general, due to the island being so heavily fortified, any landing would meet with serious difficulties unless effected after the fortifications had been destroyed. Apart from this, vessels carrying an attacking force would be subjected on approach to the fire of long-range guns.

This island possesses six bays, two in the north, two in the centre and two on the southern end. A landing, or landings, would have to be made in one or more of these bays, as the coastline of the remainder of the island consists of steep slopes of hills completely roadless.

Landing from boats would, generally speaking, be very difficult owing to the beaches being steep to, and the exposed nature of the coast line. Exceptions to this would be in the sheltered bays such as Port LAKI, SEROCAMPO, PANALE Bay, ALINDA Bay, PARTHANI Bay and possibly THREMONA Bay. It has been reported that most of the terrain inland from these beaches becomes marshy in winter.

Port LAKI.—An attempt to land in this bay appears to offer little chances of success, since both the approaches and the entrance, which is very narrow, are heavily defended. A wire gate exists at the entrance to the harbour. Furthermore, it might be expected that there would be a formidable system of local defence for the general protection of the harbour.

SEROCAMPO.—The entrance to this bay, which is about 1,000 yards in width,

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SEROCAMPO.—The entrance to this bay, which is about 1,000 yards in width, is covered by seafront defences. The beach at the head of the bay is a good sandy one, but an advance north would be difficult and would be exposed to flanking fire.

The local defences and the narrowness of the approach to the head of the bay would render boats open to a close and consequently accurate fire. It is probable that some sort of mine defence exists in the area between Pt. MARRODOCAMPO and Ile dei GABBIANI.

PANALE Bay.—The beach at PANALE Bay consists of shingle and offers a landing frontage of about 800 yards, i.e., from some 300 yards north of PORTA VECCHIA to the village of PANDELI. The approaches are covered by batteries. It is also possible that Battery No. A.A. 7 may have the dual role of A.A. and A.T.C. It is not known whether I di S. DOMENICA is defended. A formidable local defence might be expected from the beach and from M. MERAVIGLA.

A successful landing on this beach would, however, render possible the capture of the defences of M. APPETICI from the rear, and an advance towards the rear of the naval base as a whole.

LERO
LIPSO 123

ALINDA Bay and GURNA Bay (including THREMONA Bay).—These two bays, which almost divide the island in two, are very suitable for landings, and forces disembarked in both could support each other. Attacks could be made on the Northern and Southern parts of the island. As the strip of territory dividing the two bays is narrow, a very large force could not be put ashore. Fortifications in the neighbourhood of each bay would have to be destroyed.

The beach in ALINDA Bay is about 700 yards in length.

A successful landing at this point would render possible an advance against the rear of the submarine base in PARTHANI Bay. The country is apparently broken and hilly, and in consequence the rate of advance would necessarily be slow. Furthermore, the seizure of the narrow neck of land between GURNA Bay and ALINDA Bay would prevent the reinforcement of the Northern portion of the island from the south. It is reported that a road is being constructed between LERO and PARTHANI Bay.

PARTHANI BAY.—The Southern part of this bay is flat, and a metalled road leads into the interior. Although the bay is two kilometres in length, any type of vessel can approach the shore. The entrances are closed and all approaches are fortified. These fortifications would have to be destroyed if a landing is contemplated.

BLEFUII Bay (Northern end of Island).—Although small, this bay could be used for disembarking a force, but the neighbourhood is strongly fortified, rendering such an operation difficult, if not impossible.

LIPSO

(Lat. 37° 18' N., Long. 26° 47' E.)

(Plans 95 and 104.)

Reports marked * are of doubtful reliability.

(1) General Remarks

The coast of LIPSO is indented with bays and coves. The Island is 4½ miles long, and hilly in character, the highest point, MOUNT SKAFI, being about 900 ft.

Defences established in the South of the Island would assist the defences of LERO.

The population is about 500.

(2) Port Facilities

PORTO di LIPSO on the South-West of the Island is a snug little Harbour with 5 to 16 fathoms of water, mud bottom, and is partly sheltered from the South-West.

PORTO MOSCATO. This inlet at the North-West end of the Island affords good shelter in all but North-Westerly Winds.

(4) Government Establishments

Barracks

The only Barracks on the Island are in a building North of LIPSO Town.

(11) Signal Communications

* There is a portable W/T set at LIPSO Barracks.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

*No. 1 Battery: S. ASPRA. On the largest of the Islands, (?) guns of (?) calibre.

*No. 2 Battery: N.E. Coast, suggested by two range-taking stations, (?) guns of (?) calibre.

*No. 3 Battery: P. MUSKAL. On the Eastern slopes of the high ground to the West,

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*No. 3 Battery: P. MUSKAT. On the Eastern slopes of the high ground to the West, two guns of (?) calibre.

(iii) Searchlights

* There is a Searchlight on PUNTA del CALLO, commanding the bay and approaches of PORTO di LIPSO.

(v) Local Air Defences

* There is a Battery of A.A. Machine Guns, West-North-West of LIPSO Town.

(viii) Garrison

* There are 50 troops on the Island.

(13) Reconnaissance

All beaches are undefended. The most suitable for landing are:—

PORTO di LIPSO.

PORTO MOSCATO.

LAGO BAY.

No details are known of the landing facilities at the above places.

124 NISERO

NISERO (SUB-GROUP), INCLUDING YALI, KANDELIUSA AND SMALLER
ADJACENT ISLANDS

(Lat. 36° 33' - 37° N., Long. 27° 9' - 15' E.)
(Plan 96)

Reports marked * are of doubtful reliability.

(1) General Remarks

NISERO lies nine miles South of KOS. It is volcanic in origin and is dominated by a crater in the centre, which rises to 2,270 ft. at its highest point on the West side (M. PROFETA ELIA). The Island is fertile and tree crops chiefly are cultivated. The population of about 2,500 is Greek.

YALI

Prior to 1935, the whole of the island of YALI was thickly covered with dense pine forests, but, in 1935, a large area on the Western part was burnt and thoroughly cleared by the Italians.

All the inhabitants were evacuated and, after 1938, nobody except military or naval personnel was allowed to approach the island.

YALI also consists of volcanic rock, and has a steep, irregular coast-line bordered by shallow water and rocks.

KANDELIUSA, RAKHIA and RIGUSA

Of the adjacent islets, KANDELIUSA and RAKHIA are 330 and 350 ft. high, respectively; RIGUSA, which is only 235 ft. high, has a more irregular coast-line.

Water Supply

There are hot springs in NISERO, of which the chief are at TERME di PALO, on the N.E. point of the Coast, and TERME di COMMUNALI, 1½ miles East of MANDRACCHIO. Water otherwise is scarce and is preserved in tanks.

There is fresh water near the breakwater on YALI.

(2) Port Facilities

(i) NISERO

(a) MANDRACCHIO

Piers, etc.—There is fairly good anchorage for small vessels off MANDRACCHIO: about 1½ miles Eastward a mole, 50 yards long, provides shelter except in North-east winds.

Harbour Craft:—

Three motor vessels of 5-15 tons.

Five sailing vessels of 5-30 tons.

Three fishing smacks of 5 tons each.

Twenty small rowing boats.

(b) AVLAKI Harbour.

Anchorage.—AVLAKI (Porto APERATOS) is situated on the South-eastern side of the island. Ships anchor 400 yards off GRANA Point, 500 yards from AVLAKI Point and 1,500 yards from C. LOUTROS. The water is very deep; the bottom is clear and sandy. Only boats up to 5 tons can approach close inshore. The foreshore is rocky, with 60 ft. rising about 500 yards from the beach.

Pier.—There is one very small pier about 33 ft. long.

Lifting Appliances.—Nil.

Harbour Craft.—1 Sailing vessel of 5 tons.

but, in 1935, a large area on the Western part was burnt and the island was left a wasteland.

All the inhabitants were evacuated and, after 1938, nobody except military or naval personnel was allowed to approach the island.

YALI also consists of volcanic rock, and has a steep, irregular coast-line bordered by shallow water and rocks.

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Water Supply

There are hot springs in NISERO, of which the chief are at TERME di PALO, on the N.E. point of the Coast, and TERME di COMMUNALI, $1\frac{1}{2}$ miles East of MANDRACCHIO. Water otherwise is scarce and is preserved in tanks.

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Anchorage.—AVLAKI (Porto APERATOS) is situated on the South-eastern side of the island. Ships anchor 400 yards off GRANA Point, 500 yards from AVLAKI Point and 1,500 yards from C. LOUITROS. The water is very deep; the bottom is clear and sandy. Only boats up to 5 tons can approach close inshore. The foreshore is rocky, with 60 ft. rising about 500 yards from the beach.

Pier.—There is one very small pier about 33 ft. long.

Lifting Appliances.—Nil.

Harbour Craft.—1 Sailing vessel of 5 tons.

(c) PALO

Piers, etc.—There is a breakwater, used for landing, 40 yards long, with a path along the top.

Harbour craft:—

One motor vessel of 5 tons.

Two sailing vessels of 10 tons each.

Five rowing boats.

(ii) YALI

Piers, etc.—A breakwater has been constructed on YALI. It is 450 ft. long, with an 18-ft. wide path along the top; vessels up to 5,000 tons can secure to it. There is also a 300 ft. jetty. It is assumed that the intended harbour is on the North-west coast.

On the Eastern side of RIGUSA a small vessel might anchor close in during Westerly winds.

Submarines.—Both NISERO and YALI are used by submarines.

NISERO (including YALI, RAKHIA, RIGUSA and KANDELIUSA) 125

(4) Government Establishments

Barracks

There are Barracks on MANDRACCHIO Harbour and on *YALI.

Hospital

There is a Hospital on YALI.

Fuel

Oil, benzine and petrol are stored on YALI, which also has a coal depôt.

(7) Air Facilities

A small Seaplane Base on NISERO includes two Hangars, Fuel Depôt, Stores for spares and a Workshop, positions not known.

There is a Seaplane Base on YALI. *An Aerodrome is in process of construction.

(10) Transport Facilities

Roads

NISERO.—A carriage road connects MANDRACCHIO with TERME COMUNALE and TERME di PALO, on the North Coast of NISERO: there are only hill tracks on the remainder of the Island.

YALI.—There is a road from YALI Harbour to the higher parts of the Island in the north.

Sea

See RHODES.

(11) Signal Communications

Cables and Telegraph

NISERO.—*Cable and Telegraph communications have been reported.

YALI.—No information.

V/S Station

On KANDELIUSA.

(12) Defences

(i) *Sea Front Defences*

(a) *Coast Defence Batteries*.—On NISERO.—No information.

On YALI.—

*No. 1 Battery: On high ground in South of Island—1 gun of (?) calibre.

*No. 2 Battery: On high ground in North of Island—1 gun of (?) calibre.

(b) *Magazines*.

Ammunition and war material are stored near MILOKRATA (NISERO). Munitions and stores have been landed on YALI.

(iii) *Searchlight*

There is a Searchlight and guard on KANDELIUSA.

(v) *Local Air Defences*

On NISERO.—No information.

On YALI.—Two A.A. guns of (?) calibre.

(viii) *Garrison*

There are about 100 troops on the Island.

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On NISERO.—No information.

On YALI.—Two A.A. guns of (?) calibre.

(viii) Garrison

There are about 100 troops on the Island.

(13) Reconnaissance

* About two minutes' walk from the beach of AVLAKI Harbour is a large cave, which is sub-divided into several compartments. This is dry inside and can accommodate about 1,000 men. The entrance is hidden from view: a merchant named MICHALOS MICHAEL uses it as a dump for his goods prior to exporting them: the cave is connected to his store.

NISERO.—The coast is mostly made up of low cliffs, or steep-to ascents. On the North-East between C. CAZZUNI and C. MAURO, there are $1\frac{1}{2}$ miles of beach and 500 yards of beach between C. ACRO TERO and TERME di PALO.

Between TERME COMUNALE and MANDRACCHIO the coast is quite low and served by the carriage road.

The only deep cove, BAIA ROSSA, at the South-West corner of the Island, is sheltered but precipitous and without access to the interior.

YALI.—The island is divided approximately in half by a shingle bank with beaches or shallow coves opening North-West and South-East. The cliffs of the Northern half are low but steep. The Southern half is also steep, but is fringed with sand and shingle.

PATMOS

(Lat. 37° 22' N., Long. 26° 35' E.)

(Plans 92, 93, and 103)

Reports marked * are of doubtful reliability.

(1) General Remarks

PATMOS, which is a mass of barren bleak rocks throughout, is the most Northerly of the Dodecanese Islands. It is six and two-thirds miles long, and just over two miles across at its widest points, and is deeply indented with bays and inlets. Its narrowest point (between Ports SCALA and MERIKA) divides the Island approximately in half and measures only two cables across.

The population is about 2,000.

(2) Port Facilities

Port GRIKO, on the South-East, is formed between TRAGO Island and the coast. It is completely sheltered. Depth of water 5-8 fathoms. Submarines use this anchorage from time to time.

Port SKALA is an inlet three-quarters of a mile long and two cables wide with from two to twenty fathoms. It is unsuitable for use by large vessels owing to lack of shelter from the South-East: ships of the deepest draught which have been seen there are destroyers and submarines.

There are eight to ten small vessels of 45 tons each, owned by the inhabitants. These are two-masted sailing craft, some of which have auxiliary motors.

Submarines

DIAKOPTI Bay, MERIKA Bay and KAMBOS Bay are used by Submarines.

(3) The Town

The Town of PATINO or PATMOS is three-quarters of a mile South of the village of SCALA, which is at the Western end of Port SCALA. Its conspicuous feature is the twelfth century Monastery of St. John, which is on the highest point of the hill on which the Town stands, overlooking the Port, and is easily visible from the sea.

(4) Government Establishments*Barracks*

There are Barracks in the centre of the Southern water front of SCALA Village, underground for 100 men at St. ELIAS, in PATMOS Town, and on Monte DIAVOLO.

Custom House

This is by the small pier, to the East and near to the Barracks at SCALA.

Fuel

Petrol is stored at a point 700 yards due West of M. CUMANO on the Northern shore of Port SCALA. It is in a conspicuous white walled compound on the shore, from which a footpath leads up into the slopes behind.

(7) Air Facilities*Seaplanes*

Seaplanes, which come mostly from LEROS, anchor at SCALA, due North of the Town

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DIAKOPTI Bay, MERIKA Bay and KAMBOS Bay are used by Submarines.

(3) The Town

The Town of PATINO or PATMOS is three-quarters of a mile South of the village of SCALA, which is at the Western end of Port SCALA. Its conspicuous feature is the twelfth century Monastery of St. John, which is on the highest point of the hill on which the Town stands, overlooking the Port, and is easily visible from the sea.

(4) Government Establishments

Barracks

There are Barracks in the centre of the Southern water front of SCALA Village, underground for 100 men at St. ELIAS, in PATMOS Town, and on Monte DIAVOLO.

Custom House

This is by the small pier, to the East and near to the Barracks at SCALA.

Fuel

Petrol is stored at a point 700 yards due West of M. CUMANO on the Northern shore of Port SCALA. It is in a conspicuous white walled compound on the shore, from which a footpath leads up into the slopes behind.

(7) Air Facilities

Seaplanes

Seaplanes, which come mostly from LEROS, anchor at SCALA, due North of the Town of PATMOS, in Lat. 37° 20' N., Long. 26° 36' E.

*There is also an anchorage in Port GRIKO.

Aerodrome

A survey for an Aerodrome is said to be in hand.

(10) Transport Facilities

Roads

There is a carriage road from Port SCALA to PATMOS Town and thence to Mt. PROFETA ELIA. Mule tracks, practicable for mountain pack guns, lead from PATMOS to LACROCE. Mt. DIAVOLO and the Northern part of the Island.

Sea

See RHODES. Foodstuffs for the military forces are sent monthly from LERO and supplies for the civilian population weekly from RHODES.

(11) Signal Communications

W/T Stations

There is a W/T Station on Mt. St. ELIAS, and a mobile W/T Station on Monte DIAVOLO; central pole with four wires and manned by naval ratings.

V/S Stations

There is a Visual Station (heliograph) on Mt. St. ELIAS.

* There is also a Signal Station about half a mile South of C. PHERRO.

Cables

There is cable communication with LEROS.

(12) Defences

(i) *Seafront Defences*

(a) *Coast Defence Batteries*

No. 1 Battery : PUNTA BIANCA—2 guns (medium) of (?) calibre.

No. 2 Battery : North-West of SCALA Village, near the cemetery—1 gun of (?) calibre.

No. 3 Battery : BAIA di SASSILA—2 (medium) guns of (?) calibre.

No. 4 Battery : CIGLIOMODI Island—(?) guns of (?) calibre. E.D.

No. 5 Battery : TRAGO Island. On or near the Southernmost point—2 (heavy) guns of (?) calibre.

No. 6 Battery : MONTE DIAVOLO—2 or 3 (?) (heavy) guns of (?) 5.9 in. calibre.

No. 7 Battery : MONTE P. ELIAS—2 guns (heavy) of (?) calibre.

No. 8 Battery : MONTE CASTELLO—4 guns of (?) calibre.

No. 9 Battery : MONTE GUARDIA—(?) guns of (?) calibre.

(e) *Local Defences*

Wire Entanglements.—There are three lines of barbed wire at Port SCALA, and at Port GRIKO; round the shores of Port MERIKA and of MAURA KRIMNA between C. ZOLUPHI and C. ZARZALA. On the South and North of the Isthmus West of Port SCALA there are two lines of barbed wire and trenches.

(g) *Magazines*

There are Ammunition Stores at—

(i) Port SCALA, at the Western end; the main store of the Island.

(ii) MONTE DIAVOLO (*underground).

(iii) MONTE St. ELIAS : an underground Dump.

(iv) All fortified positions : underground.

* There are underground ammunition stores at all fortified places.

Observation Posts

There are Observation Posts at—

(i) MONTE DIAVOLO.

(ii) MONTE St. ELIAS.

* (iii) St. NIKOLAO, between the Chapel and the sea.

(iv) C. VERANOS.

* (v) C. ZOLUPHI.

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No. 7 Battery : MONTE P. ELIAS—2 guns (heavy) of (?) calibre.
No. 8 Battery : MONTE CASTELLO—4 guns of (?) calibre.
No. 9 Battery : MONTE GUARDIA—(?) guns of (?) calibre.

(c) *Local Defences*

Wire Entanglements.—There are three lines of barbed wire at Port SCALA, and at Port GRIKO; round the shores of Port MERIKA and of MAURA KRIMNA between C. ZOLUPHI and C. ZARZALA. On the South and North of the Isthmus West of Port SCALA there are two lines of barbed wire and trenches.

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There are Observation Posts at—

- (i) MONTE DIAVOLO.
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- * (iii) St. NIKOLAO, between the Chapel and the sea.
- (iv) C. YERANOS.
- * (v) C. ZOLUPHI.

(ii) *Movable Armament*

See DODECANESE—GENERAL.

(iii) *Searchlights*

Searchlights have been located at—

- (a) C. ZOLUPHI.
- (b) MONTE St. ELIAS.
- (c) C. YERANOS.
- (d) MONTE KONADROVOUNO (North-West of YERANOS).
- (e) MONTE VATHY.
- * (f) MONTE GROSSO.
- (g) C. SIDERIO.

PATMOS
PISCOPI

(iv) *Local Seaward Defences*

Minefields.—Mines have been laid as follows:—

- (a) Between the North-West of PATMOS and ANEDRO Island.
- (b) Between PATMOS and GAIDARO.
- (c) From Port STAVROS to C. TELOS (KALIMNO).
- *(d) From C. SEKAMINA to C. YENUPA.

(v) *Local Air Defences*

A.A. Batteries

- No. 1 Battery: MONTE PRASSON—2 guns of (?) calibre.
- No. 2 Battery: St. ELIAS—2 guns of (?) calibre.
- No. 3 Battery: St. John's Monastery: in PATMOS Town, sited at or near the Monastery—2 guns of (?) calibre.
- No. 4 Battery: MONTE GUARDIA—2 guns of (?) calibre.
- No. 5 Battery: MONTE GROSSO—2 guns of (?) calibre.
- No. 6 Battery: C. YERANOS, to the West—2 guns of (?) calibre.

(viii) *Garrison*

* The garrison consists of about 300 men.

(13) *Reconnaissance*

- (a) MERIKA Bay is very suitable for landing. There are only two short stretches of slope between low cliffs. The Bay, however, leads into the Northern half of the Island, where there is no town. Access to the Harbour town in Port SCALA is difficult and would be commanded from M. CASTELLO on the isthmus.
 - (b) GRIKO Bay. About a quarter of a mile of beach with some houses and gardens. A steep track, gradient 1 in 8, leads straight up to the town and monastery.
 - (c) KAMBOS Bay. Like MERIKA, this Bay is in the wrong half of the Island. It has a quarter of a mile of beach, commanded from both ends. There are houses and gardens behind.
 - (d) OLAKAS (or GHIAIA, "Gravel" Bay), is on the West coast, about 550 yards from Port SCALA. It has just over a quarter of a mile of open beach, commanded by M. CASTELLO at the Northern end, and by high slopes to the South.
- In the absence of definite information, all beaches should be considered to be defended.

PISCOPI (or TILOS)

(Lat. 36° 28' N., Long. 27° 21' E.)
(Plan 99)

Reports marked * are of doubtful reliability.

(1) *General Remarks*

PISCOPI is in one of the small group of Islands lying South of KOS. It is nine miles long, irregular in shape, and characterised by numerous mountain peaks of which the highest, AGIOS ELIAS, is 2,010 ft. The population, which is Greek, numbers about 1,500, and chiefly through agriculture and the raising of cattle, is more or less self-supporting. The lowland plains yield grain, grapes, olives, almonds and figs, etc.

Water Supply

Water, which is scarce, is supplied by springs and cisterns.

No. 1 Battery: MONTE GROSSO—2 guns of (?) calibre.
No. 5 Battery: MONTE GROSSO—2 guns of (?) calibre.
No. 6 Battery: C. YERANOS, to the West—2 guns of (?) calibre.

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Water Supply

Water, which is scarce, is supplied by springs and cisterns.

(2) **Port Facilities**

LIVADIA Bay, which is about 3 mile wide, provides the safest anchorage, but it is exposed to North-East winds.

Submarines

* There is a small supply base for submarines in the South-East Corner of LIVADIA Bay.

(3) **The Town**

The seat of local government is in MEGALOCORIO, 14 miles from PLAGIO Bay, and 328 ft. up the hillside, looking South towards ERISTO Bay.

(4) **Government Establishments**

Barracks

There is a Barracks with accommodation for 500 men in the village of ERISTO

* There is a Naval guardhouse opposite the Monastery of AGIOS ANTONIOS

(7) Air Facilities

* There is a Small Seaplane supply base with the Submarine base in LIVADIA Bay.

(10) Transport Facilities

Roads

A track connects MICROCORI, MEGALOCORIO and ERISTO with LIVADIA. The remainder of the Island is served by tracks.

Sea

See RHODES.

(11) Signal Communications

W/T Station

There is a W/T Station at AGIOS ELIAS.

V/S Stations

(a) AGIOS ELIAS, between MICROCORI and MEGALOCORIO on the North-West Coast.

(b) LIVADIA Bay, on the high ground to the South.

Cable

The submarine cable connecting RHODES, KOS and PISCOPI ends at SKAFI, which is near the small port of AGIOS NICOLAOS.

(12) Defences

(i) Sea Front Defences

(a) *Coast Defence Batteries*.—There is one gun of 3-in. calibre in the South-East of the Island, on or near M. GERONDA.

Other Defence Works have been under construction.

(c) *Wire Entanglements*.—There are wire entanglements, just over 1,000 yards in length, from AGIOS ANTONIOS to APERATO, about 30 yards from the shore.

There are similar entanglements between KOULIANOU and KROUTOUMAKI, in the ERISTO area.

(g) *Magazines, etc.*—(i) AGIA PARASKEVI, near PIGI, in the Church.

(ii) MEGALOCORIO, in the Church of AGIOS CHARALAMBOS.

Observation Posts.—(i) AGIOS ELIAS, between MICROCORI and MEGALOCORIO on the North-West coast.

(ii) LIVADIA Bay, on the high ground to the South.

(iv) Local Seaward Defences

Mines.—* Mines have been laid in the channel between PISCOPI and RHODES, Lat. 36° 20' N., Long. 27° 28' E.

(v) *Local Air Defences*.—* There are A.A. guns on the Island, but no details are known.

(viii) Garrison

There are about 150 troops on the Island.

(13) Reconnaissance

Much of the coastline is high cliff, particularly on the North-West side. The only beaches are in LIVADIA, PLAGIO and ERISTO Bays.

LIVADIA Bay

There are a few houses here and along the beach. A track leads from the landing place to MICROCORI.

PLAGIO Bay

Coast.

(b) LIVADIA Bay, on the high ground to the South.

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The submarine cable connecting RHODES, KOS and PISCOPI ends at SKAFI, which is near the small port of AGIOS NICOLAOS.

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LIVADIA Bay

There are a few houses here and along the beach. A track leads from the landing place to MICROCORI.

PLAGIO Bay

A track leads from the landing place to MEGALOCORIO which is invisible from the beach.

ERISTO Bay

No landing cove.

Wind Conditions

The Eastern part of the island is exposed to the South Wind, which, however, is not violent during spring and summer as is the case in autumn and winter. The North-Eastern part of the island is exposed to the North wind, but even in winter this would not render operations out of the question.

Depth of Water

On the Southern and Western sides of the island there are numerous points at which lighters can easily accost. Troopships can approach to within 800 yards.

Water Supply

The water supply on all beaches is reported to be sparse.

(C46758)

RHODES

(See Plans Nos. 71, 72, 102, 114, and 115)

Reports marked * are of doubtful reliability.

(1) General Remarks

RHODES, which is the largest and most important of the Dodecanese Islands, is 40 by 15 miles, and has a population of upwards of 60,000. From the point of view of military operations it possesses a triple interest:—

- (a) It is the capital Island in which the Governor resides.
- (b) It controls the passage from the ÆGEAN SEA to the Eastern MEDITERRANEAN.
- (c) It is an excellent departure base for naval, military and air operations against ANATOLIA, other islands in the ÆGEAN SEA, or shipping.

RHODES is an important landplane base and a minor naval base.

(2) Port Facilities

There are no good harbours in the Island of RHODES, and vessels must generally anchor off the roadsteads, cargo being landed by means of boats and lighters.

The town of RHODES has two artificial harbours.

- (a) PORTO Del MANDRACCIO, the northern harbour, is protected from the east by an ancient mole extending to the northward to the Tower of S. NICOLA, 500 yards from the shore. Two short breakwaters form the northern side of the harbour, one (MOLO Della LUPA) extending westward from the Tower of S. NICOLA and the other (MOLO CERVO) eastward from the opposite shore, leaving a very narrow entrance into the harbour. There are five white masonry pillars used as mooring posts on the eastern or outer side of S. NICOLA MOLE, and a vessel can lie at the head of the harbour even during a Sirocco wind with anchors down and stern cables out. Naval ships moor in the harbour, in which there is a dépôt ship permanently moored, which houses naval and administrative personnel. There are two small wharves on the eastern wall of the harbour.

Depth of water: 30 ft.

- (b) PORTO MERCANTILE, the southern harbour, is protected from the east by the main eastern mole (TRE Dei MOLINI), 700 ft. long, which extends northward from the shore at the eastern angle of the city and closes the port on its eastern side.

A transverse mole extends eastward from the northern end of the city towards the seaward end of the main mole, the harbour thus formed being little more than a cable wide at the entrance.

The harbour is open to the northward but is generally safe as the wind seldom blows from that quarter and does not send in much sea.

Small vessels haul within the piers on the western side of the harbour, but the water is very shallow in this area.

Large vessels moor, with a sternfast to the main eastern mole, and lie securely in southerly gales, the worst weather on this coast. In an easterly wind the anchorage is in the BAY of TRIANDA, and communication with the shore is by BRUSSALI wharf in this bay.

Depth of water, in shore end of TRE dei MOLINI: 15 ft.

There is no organised water supply and a shortage sometimes occurs in the summer.

KANDIA Bay is the third and easternmost of the harbours in the island of RHODES. It is shallow and infrequently used by shipping.

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* There is a submarine base in the small bay to the north of PRASSO peninsula.

Anchorage

During the summer large vessels anchor 2 to 3 cables due east of S. NICOLA tower in 9 to 13 fathoms, sand, and in the winter half a mile north-east from the tower in about 29 fathoms.

LINDOS, on the south-east coast, with VLICA Bay and its port, offer the best natural shelters. Work in connection with providing facilities for small vessels is in progress at LINDOS.

KAPRIA BAY, on the north-west coast, has a stone quay, very well built, about 100 yards long, with six to eight bollards, but there are no other facilities.

Harbour Craft

These include four motor launches, 40 ft. long, each having a passenger capacity of about sixty. There is a fuel barge with tank and pump for supplying petrol to seaplanes. There are

RHODES 131

also about thirty sailing lighters of 4 to 15 tons capacity. In addition, the inhabitants own twenty small vessels, of capacity 120-140 tons each. These are two-masted sailing craft, some of which have auxiliary motors.

Lifting Appliances

A small hand crane (about two tons) capable of travelling about 15 yards on rails is situated on the harbour end of the main mole.

(3) The Town

The city of RHODES, with a population of about 26,000, may be divided into two separate towns, the ancient city and the new town, which has been built round it since the Italian occupation. The old city is entirely enclosed by walls and fortifications built by the Knights in the form of an amphitheatre, on ground rising gently from the water's edge. The streets are narrow and winding, but remarkably clean; mean houses have generally replaced the substantial buildings of the Knights.

The modern town is well laid out and possesses many imposing and well constructed buildings, the more important being the new cathedral, Governor's Palace, Banco Italia, technical school, law courts, military barracks, Circolo Italia, the Grand Hotel des Roses, and a well-equipped hospital. The foreshore has been reconstructed and a promenade made along the sea front with a landing place opposite the Circolo Italia, where there is sufficient water for picket boats to go alongside.

The market, a conspicuous building with a green roof and dome in the centre, is situated on the south-western side of the northern harbour.

There is a Government Spa on the coast about 5 miles southward of the town of CALITEA.

Water Supply

The water supply is by aqueduct starting half a mile from the town on the RODINI plateau, behind the Mussolini Camp.

(4) Government Establishments*Barracks*

Barracks.	Unit.	Accommodation.
REGINA barracks	1 battalion	4,000
ANNEN of REGINA barracks	4 battalions	1,300
Artillery barracks outside the town		380
S. GIOVANNI barracks	1,300 artillerymen	200
CALITEA	180 infantrymen, 200 artillerymen	100
AFANDO	200 artillerymen	100
GLITO and COTSUNO	100 artillerymen	100
CALATO (see LINDOS).	100 artillerymen, 1 infantry company	200
ELEUSSA	100 artillerymen	100
PSITO-MASSARI	100 artillerymen	100
CAPOCHINA	100 artillerymen	100
PILONA	100 artillerymen	100
LARDO	100 artillerymen	100

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CALATO (see LINDOS).		100
ELEUSSA	100 artillerymen	1,200
PSITO-MASSARI	100 artillerymen	2,500
CAPOCHINA	100 artillerymen	700
PILONA	100 artillerymen, 1 infantry company	2,150
LARDO	100 artillerymen	4,500
IANNADI	12 huts (1,200 men)	50
VATI	2 battalions of the 9th Infantry Regiment and two of the 10th Infantry.	106
MONTERO	700 ratings	500
CREMASTO	2,000 artillerymen, 150 ratings	2,600
CAMPO CHIARO	45 huts	2,000
TASCHISI	50 men	1,200
ARCHANGELO	106 artillerymen	1,200
LINDOS	500 men	200
SALAGO	26 huts	5,000
APOLLONA	20 huts	2,500
CALAVARDA	12 huts	
FANE	12 huts	
COSCHINO	200 ratings	
ASGURO	Hutments	
MARIZZA	2,500 airmen, situated N.W.	
	Total	32,886

(C46755)

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In addition to the above there are barracks, huts and encampments, accommodation not known, as follows:—

FILEREMO	..	..	Six barracks behind the church.
M. STEFANO	..	..	Three wooden barracks. Sited at a distinctive bend in the road.
RODINI	..	..	New barracks.
PLIMIRA	..	..	Barracks.
M. ORO	..	..	Three barracks near underground benzine reservoirs; 300 ft. above sea-level. The whole district is a prohibited area.
PILONA	..	..	Further barracks located 1 mile north-west of the village.
North-West of the HOTEL DES ROSES.			Barracks.
CALATO VILLAGE	..	..	Half a mile south-east of the village. Large new barracks in the hills adjacent to the aerodrome.
ZAIRI	..	..	Barracks.
EMBONA	..	..	Barracks.
MONOLITHO	..	..	Barracks.
PEVERAGNO	..	..	Encampment.

There is a large concentration of troops in the neighbourhood of M. PROFETA ELIA, APOLLONA, M. SPIRELLI and DIMILLA.

Fuel

Fuel tanks and dumps are sited as follows:—

PORTO MERCANTILE	..	..	There is a submarine refuelling station inside the harbour, near KANDIA Point.
MARRAS, near C. COVA	..	..	In position Lat 36° 25' 35" N., Long. 28° 16' 40" E., sited 1,200 yards south of C. COVA, three oil tanks enclosed by a wall. A pipeline runs from the tanks along the pier, and vessels refuel alongside. There is a large dump of fuel in barrels between the tanks and the pier. The total capacity of the three tanks is 7,000 tons. There are further tanks with a capacity of 5,000 tons.
COVA	..	..	There are eight large underground tanks; 1,000 yards south of the town where there is a right-angled bend in the eastern littoral road.
HOTEL DES ROSES, North-West of.			Oil tanks.
M. STEFANO	..	..	A petrol depôt.
SALACO	..	..	There is a benzine depôt of some importance north-west of the village on the road to RHODES.
			In the village itself there is a vast underground benzine depôt.
CREMASTO	..	..	Petrol for aircraft is drawn from large dumps sited on the aerodrome; these dumps are kept supplied by lorries from petrol stores in RHODES town and at ASGURO. There are also stores of benzine half a mile from the village.

At the foot of the hill adjacent to the aerodrome there

BARRACKS.

EMBONA ..

Barracks.

MONOLITHO ..

Barracks.

PEVERAGNO ..

Encampment.

There is a large concentration of troops in the neighbourhood of M. PROFETA ELIA, APOLLONA, M. SPIRELLI and DIMILLA.

Fuel

Fuel tanks and dumps are sited as follows:—

PORTO MERCANTILE ..	There is a submarine refuelling station inside the harbour, near KANDIA Point.
MARRAS, near C. COVA	In position Lat. 36° 25' 35" N., Long. 28° 16' 40" E., sited 1,200 yards south of C. COVA, three oil tanks enclosed by a wall. A pipeline runs from the tanks along the pier, and vessels refuel alongside. There is a large dump of fuel in barrels between the tanks and the pier. The total capacity of the three tanks is 7,000 tons. There are further tanks with a capacity of 5,000 tons.
COVA ..	There are eight large underground tanks; 1,000 yards south of the town where there is a right-angled bend in the eastern littoral road.
HOTEL DES ROSES, North-West of M. STEFANO	Oil tanks.
SALACO ..	A petrol depot.
CREMASTO ..	There is a benzine depot of some importance north-west of the village on the road to RHODES. In the village itself there is a vast underground benzine depot.
LINDOS-CALATO drome.	Petrol for aircraft is drawn from large dumps sited on the aerodrome; these dumps are kept supplied by lorries from petrol stores in RHODES town and at ASGURO. There are also stores of benzine half a mile from the village.
C. LACANIA ..	At the foot of the hill adjacent to the aerodrome there are enormous cuttings in which six iron tanks have been placed. The tanks are 165 ft. long and they are connected to the shore by iron pipes enclosed in concrete.
S. GIORGIO ..	There are electric pumps near the tanks which pump benzine from tankers in the bay.
	Near the walls of the ammunition depot there are about 2,000 barrels of benzine, each containing about 25 gallons.
	An underground petrol depot about 1½ miles east of LACANIA.
	There are three liquid fuel reservoirs at the base of the small point to the south of S. GIORGIO, next to and south of a factory with a chimney. They are masked from the sea by a high wall.

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MARIZZA Aerodrome .. (1) The main underground petrol dump is situated between the five hangars and the air force headquarters buildings. There is a Decauville railway in the underground passage joining up the hangars.
 (2) Petrol for aircraft is drawn from a tank situated between the ALA LITTORIA hangar and the restaurant of the civil airport.
 (3) Another petrol store, containing oil in drums, is situated close to the air force administrative buildings at the south-west of the aerodrome. It is surrounded by wire entanglements and hidden by trees.

S. ISIDORO .. To the north-east there is an important petrol depot consisting of about ten buildings, camouflaged green and chestnut, for the storage of petrol in drums. There are also underground tanks of 280 tons capacity.

IANNADI .. There is an underground petrol and oil dump 1 1/4 miles north of the town.

APOLLONA .. In a forest, in the triangle formed by the villages of APOLLONA, DIMILLA and PLATANIA, there is an underground benzine depot, consisting of about twenty tanks.

LARDO .. There is an underground petrol depot in the village of ASCLIPIO, about 8 miles west-south-west of LARDO.

CAMPO CHIARO .. Petrol depot.

RODINI .. Petrol dumps.

ASGURO .. Petrol dumps from which CREMASTO aerodrome is supplied.

KANDIA BAY .. Petrol tanks.

CATTAVIA .. Between CATTAVIA and C. PRASSO there are underground oil storage tanks.
 At CATTAVIA aerodrome there is a petrol depot.

ARCHANGELO .. There are petrol and oil stores between ARCHANGELO and MASSARI.

MASSARI .. Petrol depot.

M. PROFITA ELIA .. A large petrol dump in the forest, at the foot of the mountain. It is camouflaged by branches of trees.

M. ORO .. Underground benzine reservoirs, about 330 ft. above sea-level, near large barracks. The entire district is a prohibited area. There are three entrances.

MONOLITHOS .. There are benzine depôts.

TRE dei MOLINI .. There is a small stock of coal at the base of this mole.

M. FILEREMO .. Petrol stored in drums on either side of the road, under olive and pine trees.

PILONA .. Petrol.

MALONA .. (Position 36° 12' N., 28° 05' E.) 2,000 drums of petrol.

ZAIRI .. 10,000 barrels of petrol, in heaps of 200-300.

Other Government Buildings

IANNADI .. There is an underground petrol and oil dump 1½ miles north of the town.

APOLLONA .. In a forest, in the triangle formed by the villages of APOLLONA, DIMILLA and PLATANIA, there is an underground benzine depôt, consisting of about twenty tanks.

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ZAIRI .. 10,000 barrels of petrol, in heaps of 200-300.

Other Government Buildings

Headquarters.—The Headquarters of the Fighting Services are all situated in the area adjacent to the western shore of Porto del MANDRACCHIO.

Cavalry Stables.—There are cavalry stables to the west of ISTRIO.

M/T parks and supplies

S. GIOVANNI

To the west-north-west of this suburb there are military encampments, gun and M/T parks. There is also an M/T park between S. GIOVANNI and RHODES Town.

CAMPO CHIARO

Here is the largest concentration of M/T on the island and large supply stores.

General Stores

There are 30-40 sheds, filled with general stores, on either side of the road approximately 2,700 yards N.E. of PASTIDA.

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(5) Commercial Establishments

Alliotti Flour Mill

Position: 200 yards south-south-east of the southern end of the eastern breakwater of KANDIA Cove, clearly visible in all directions.

This is a building of several storeys. In and around this mill and the grain stores described below are concentrated 80 per cent. of the flour and grain stocks of the DODECANESE.

Grain and Wheat Stores

Position: In the ANARGIRON parish of RHODES, close to the border of the ANASTASIAS parish, which is at the south-western corner of the old walled city and outside the walls; adjoining barracks and to the south-east of them.

Dimensions: 60 ft. by 120 ft. by 15 ft. Here are kept pulses, rice, macaroni and tinned goods, and wheat and grain for milling at the ALLIOTTI flour mill.

Note.—In the immediate neighbourhood of this mill and store are oil tanks, workshops, barracks and other targets.

* The barracks are now occupied by 300 Greek Dodecanese prisoners. There are also a carpet and cigarette factory; positions not known.

(6) Aircraft Factories

Nil.

(7) Air Facilities

Seaplane bases

(a) *MARRAS.*—The Seaplane Base is situated in Lat. $36^{\circ} 25' 15''$ N., Long. $28^{\circ} 17' 00''$ E. 500 yards west of the fuel tanks on C. COVA. There is a semi-circular stretch of water of radius of 0.6 mile on which seaplanes can alight. There are three hangars built into the rock and there is one slipway and accommodation for ten aircraft. This base is equipped with facilities for the repair of seaplanes and other aircraft. Four aircraft can be dealt with simultaneously. During the summer the prevailing wind is from the north and the base is protected. But in winter the bad weather prevents the planes from leaving their hangars, although the latter are above sea level. Naval seaplanes also use moorings in the commercial ports.

(b) **MOLO CERVO.*—A new quay has been constructed from the east end of the MOLO CERVO, parallel with the shore, to the Naval Club, and a seaplane base has been established there.

(c) **VLICA BAY*, in Lat. $36^{\circ} 06' 00''$ N., Long. $28^{\circ} 07' 00''$ E.

(d) The Governor's seaplane is accommodated in a concrete hangar in the south-east corner of KANDIA Bay.

Aerodromes

There are only three aerodromes on RHODES Island which are capable of dealing with all types of aircraft: (a) MARIZZA, (b) LINDOS-CALATO, and (c) CATTAVIA.

(a) *MARIZZA.*—A military and civil aerodrome is situated 2 miles north of MARIZZA, in Lat. $36^{\circ} 22' 45''$ N., Long. $28^{\circ} 09' 30''$ E. The aerodrome is 950 yards by 750 yards and roughly oval in shape. There are two entrances, one on the north side and the other on the north-west. The aerodrome is fenced off with a double line of barbed wire entanglements. It is easily discoverable from the air: on the summit of a nearby hill there is a large cross, one arm of which points directly to the centre of the aerodrome.

There are five large hangars with eight wide sliding doors. Three of these have accommodation for fifteen bombers each, one for sixteen fighters. The fifth, a civil hangar, is sited

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There is a concrete runway, north-west/south-east, extending at both ends beyond the perimeter and to the south-east over the MARIZZA-CREMASTO road: it measures about 1,200 yards. A 700-yard taxi-track is under construction from the perimeter to the west to blast shelters and dispersal points.

There are searchlights on all the large buildings.

The hangars are all camouflaged: four are on the southern perimeter, one on the eastern, and all adjoin the CREMASTO-MARIZZA road. It has been reported that there are always fifty to sixty machines at this aerodrome.

(b) *LINDOS-CALATO*.—A large aerodrome, Lat. 36° 08' 10" N., Long. 28° 06' 30" E., is sited north-west of LINDOS and 1½ miles north by east of CALATO village. It is bounded on the north by the River GADDURA and the sea is 50 yards to the east. The hangars are either underground or cut out of the side of the mountain. The shape of the landing ground is irregular, average length 1,350 yards, greatest width 1,100 yards, smallest width 750 yards.

A runway north-west/south-east (about 540 yards long) is in use. Dispersal area, 250 yards deep, on north-west and south-west boundaries.

The aerodrome is protected by the 6-in. coast defence battery on the high ground north of LINDOS.

(c) **CATTAVIA**.—This aerodrome is sited 1 mile south-east of CATTAVIA village position Lat. 35° 56' 20" N., Long. 27° 49' 25" E., in an area entirely surrounded by hills. The landing ground, which is usable but is water-logged in wet weather, measures 1,200 by 1,050 yards and is roughly pentagonal in shape: the presence of a large number of aircraft is reported. The hangars, which are under construction, are either underground or are being cut out of the mountain side. A runway 900 yards long is under construction north-west/south-east. Petrol depot exists.

The aerodrome is bounded by a circular track 65 yards wide.

(d) ***MASSARI**.—A military aerodrome is under construction. The landing ground is already usable. A large number of aircraft is reported there.

(e) ***ISIDORO**.—There is a military aerodrome at S. ISIDORO.

(f) **CREMASTO**.—This new aerodrome is now completed and is for military purposes. It is situated north of MARIZZA aerodrome.

There are workshops and a technical staff numbering 250 men, and machinery for the adjustment and repair of aircraft and the manufacture of spare parts.

(g) ***RIVER LIRENO**.

(h) ***AFANDO**.

(i) ***CAMPOGOLF**.—Between Villamarina and C. COVA.

(j) ***CHIMMARI**.—There is an aerodrome just east of M. CORTIZONA.

(k) ***MONOLITHOS**.

(8) **War Material Factories**

Nil.

(9) **Power Plants**

Electric Power Station

There is a generating station for supply to the civil population in the town. It is situated inside the north-east gate of the Walled City on the water front on the west side of the harbour; the plant is said to consist of two gas or Diesel engines. It is doubtful whether the capacity of the plant could in addition provide for service requirements.

* There is an important electrical plant in the neighbourhood of PASTIDA, to the east of MARIZZA aerodrome, and it is possible that this is a power station.

* Other power stations exist at CREMASTO and MARIZZA.

(10) **Transport Facilities**

Railways

Nil.

Roads

RHODES town is connected with the remainder of the island by a series of good roads, practically all of recent Italian construction, of a total length of about 95 miles metalled, 190 miles unmetalled. The most important road is the motor highway which encircles most of the island, and serves both the tourist traffic and military needs; all important defence stations are connected with it by branch roads. This highway is described as 16 ft. to 22 ft.

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There are regular bus services to all the principal villages. On the east coast the road runs as follows:—

RHODES-CALITEA-AFANDO-ARCHANGELO-MALONA-LINDOS-LARDO-IANNADI-LACANIA-PLIMIRA-CATTAVIA.

It goes across high ground and descends to APOLLACHIA-MONOLITHOS-inland to S. ISIDORO-SALACO-(loop to EMBONA)-CALAVARDA-SORONI-VILLANOVA-CREMASTO-TRIANDA and back to RHODES.

The only bridges thought, from the reading of large-scale maps, to be visible from seaward are mentioned below.

The term "beach" is used when the shore is either sandy or pebbly, and "coast" when the nature of the shore is not known.

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(1) *RHODES TO COSCHINO (East Coast)*: C. *VODI*.—(i) North-north-west, 4 km. Two bridges over small torrents 250 metres from coast. Lat. $36^{\circ} 24' 45''$ N., Long. $28^{\circ} 14' 0''$ E.
 (ii) North-west, 3.2 km. Bridge over torrent 400 metres from coast. Small island in front of mouth of stream. Lat. $36^{\circ} 24' 5''$ N., Long. $28^{\circ} 13' 45''$ E.
 (iii) North-west, 2.3 km. Bridge over small torrent 500 metres from beach. Lat. $36^{\circ} 23' 30''$ N., Long. $28^{\circ} 13' 50''$ E.

(2) *RHODES TO LACANIA (East Coast)*: C. *VODI*.—South-west, 7 km. Bridge over stream, altitude 21 metres. Vineyards and woods between bridge and coast. Distance from beach 1.6 km. Lat. $36^{\circ} 20' 35''$ N., Long. $28^{\circ} 11' 35''$ E.

AFANDO.—South-west, 6 km. Reinforced concrete bridge over torrent PERA (150 metres long). Distance from mouth of torrent 1.8 km. Lat. $36^{\circ} 16' 55''$ N., Long. $28^{\circ} 9' 40''$ E.

C. *VAHYAH*.—West-north-west, 3 km. Bridge over torrent LUTANI (100 metres long) 2.5 km. from river mouth. Lat. $36^{\circ} 15' 15''$ N., Long. $28^{\circ} 8' 35''$ E.

GALUNI.—(i) North-east, 3 km. Bridge over torrent 6 km. from coast. Lat. $36^{\circ} 3' 40''$ N., Long. $27^{\circ} 59' 40''$ E.

(ii) From north-east, 2.3 km., to north, 0.7 km., there is a series of seven small bridges over torrents about 100 metres from coast. Lat. $36^{\circ} 3' 15''$ N., Long. $27^{\circ} 59' 30''$ E., to Lat. $36^{\circ} 2' 40''$ N., Long. $27^{\circ} 58' 30''$ E.

CHIOTARI.—Immediately south-west of village, 250 metres south-west, and 700 metres south-west. Three small bridges over streams; 50–100 metres from the coast. Lat. $36^{\circ} 2' 15''$ N., Long. $27^{\circ} 57' 30''$ E.

IANNADI.—North-east, 1.5 km. Bridge over stream 450 metres from beach. Lat. $36^{\circ} 1' 35''$ N., Long. $27^{\circ} 56' 20''$ E.

LACANIA.—North-east, 4.9 km. Bridge over MORO torrent 1 km. from beach. Lat. $35^{\circ} 59' 20''$ N., Long. $27^{\circ} 54' 25''$ E.

(3) *CASTELLO TO RHODES (North-west Coast)*: *KAPRIA*.—East-south-east, 0.8 km. Bridge over torrent 200 metres from the coast. Lat. $36^{\circ} 15' 50''$ N., Long. $27^{\circ} 49' 35''$ E.

MANDRICO.—North-north-east, 0.3 km. Bridge over stream 0.5 km. south of mouth of river TRESS. Lat. $36^{\circ} 26' 55''$ N., Long. $27^{\circ} 51' 40''$ E.

SORONI.—(i) West-south-west, 1.3 km. Long bridge over river PLATISSI (ford higher up the river) 1.3 km. from mouth of river. Lat. $36^{\circ} 21' 0''$ N., Long. $27^{\circ} 59' 30''$ E.

(ii) Immediately west of village. Bridge over stream 1 km. from the coast. Lat. $36^{\circ} 21' 15''$ N., Long. $28^{\circ} 0' 10''$ E.

TOLO.—(i) North-north-west, 1.0 km. Small bridge over VUVESA ARIAGI torrent; 0.5 km. from beach. Lat. $36^{\circ} 22' 30''$ N., Long. $28^{\circ} 2' 15''$ E.

(ii) North, 1.4 km. Small bridge over VADIE ARIAGI 350 metres from beach. Lat. $36^{\circ} 22' 40''$ N., Long. $28^{\circ} 2' 40''$ E. Three small bridges or culverts 0.3 km., 0.6 km., 0.7 km. east along the road from (ii).

VILLANOVA.—West-south-west, 2.9 km. Bridge over torrent ATOVUNI ARIAGI (? visible from sea). 0.6 km. from beach. Lat. $36^{\circ} 23' 0''$ N., Long. $28^{\circ} 3' 30''$ E.

CREMASTO.—West, 0.5 km. Large bridge over bed of CREMASTO River 0.9 km. from mouth of river. Lat. $36^{\circ} 24' 5''$ N., Long. $28^{\circ} 6' 55''$ E.

Sea

The armed steamer "Fiume" carries out a weekly service between RHODES, PISCOPI, NISERO, KOS, KALIMNO, LERO and PATMOS. She leaves KALIMNO for LERO every Tuesday in the early morning; she sails from LERO early on Wednesday, calls at KALIMNO, and leaves on the same morning for KOS, NISERO, PATMOS and RHODES. She is armed with one light gun forward and has two A.A. machine-guns on the bridge and two aft. The M.S. "Asmara" (unarmed) also runs a regular service between RHODES, KOS, KALIMNO and

(ii) From north-east, 2.3 km., to north, 0.7 km., there is a series of seven small bridges over torrents about 100 metres from coast. Lat. $36^{\circ} 3' 15''$ N., Long. $27^{\circ} 59' 30''$ E., to Lat. $36^{\circ} 2' 40''$ N., Long. $27^{\circ} 58' 30''$ E.

CHIOTARI.—Immediately south-west of village, 250 metres south-west, and 700 metres south-west. Three small bridges over streams; 50–100 metres from the coast. Lat. $36^{\circ} 2' 15''$ N., Long. $27^{\circ} 57' 30''$ E.

IANNADI.—North-east, 1.5 km. Bridge over stream 450 metres from beach. Lat. $36^{\circ} 1' 35''$ N., Long. $27^{\circ} 56' 20''$ E.

LACANIA.—North-east, 4.9 km. Bridge over MORO torrent 1 km. from beach. Lat. $35^{\circ} 59' 20''$ N., Long. $27^{\circ} 54' 25''$ E.

(3) **CASTELLO TO RHODES (North-west Coast):** **KAPRIA.**—East-south-east, 0.8 km. Bridge over torrent 200 metres from the coast. Lat. $36^{\circ} 15' 50''$ N., Long. $27^{\circ} 49' 35''$ E.

MANDRICO.—North-north-east, 0.3 km. Bridge over stream 0.5 km. south of mouth of river TRESS. Lat. $36^{\circ} 26' 55''$ N., Long. $27^{\circ} 51' 40''$ E.

SORONI.—(i) West-south-west, 1.3 km. Long bridge over river PLATISSI (ford higher up the river) 1.3 km. from mouth of river. Lat. $36^{\circ} 21' 0''$ N., Long. $27^{\circ} 59' 30''$ E.

(ii) Immediately west of village. Bridge over stream 1 km. from the coast. Lat. $36^{\circ} 21' 15''$ N., Long. $28^{\circ} 0' 10''$ E.

TOLO.—(i) North-north-west, 1.0 km. Small bridge over VUVESA ARIAGI torrent; 0.5 km. from beach. Lat. $36^{\circ} 22' 30''$ N., Long. $28^{\circ} 2' 15''$ E.

(ii) North, 1.4 km. Small bridge over VADIE ARIAGI 350 metres from beach. Lat. $36^{\circ} 22' 40''$ N., Long. $28^{\circ} 2' 40''$ E. Three small bridges or culverts 0.3 km., 0.6 km., 0.7 km. east along the road from (ii).

VILLANOVA.—West-south-west, 2.9 km. Bridge over torrent ATOVUNI ARIAGI (? visible from sea). 0.6 km. from beach. Lat. $36^{\circ} 23' 0''$ N., Long. $28^{\circ} 3' 30''$ E.

CREMASTO.—West, 0.5 km. Large bridge over bed of CREMASTO River 0.9 km. from mouth of river. Lat. $36^{\circ} 24' 5''$ N., Long. $28^{\circ} 6' 55''$ E.

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Air

RHODES is, in normal times, an important place of call for both land and seaplane services.

(11) Signal Communications

W/T Stations

The main transmission station, situated at RODINO, has three lattice masts, 100 ft. high, with buildings at the base of the central pylon.

There is a naval reception station to the west of the town, with two lattice pylons situated close to the Via dell Immacolata, 190° , 14 miles from S. ELMO Lt.

A very powerful W/T station is situated at PASTIDA to the east of MARIZZA.

There is also a W/T station at or near NEOCORI.

D/F Stations

There is a D/F station at the seaplane station and another at MARIZZA Aerodrome.

Signal Station

A signal station has been erected at CASTELLO for the purpose of communicating with the Island of ALININIA.

Cables

The shore end of the cables to MARMARICE, SCARPANTO and SITIA is at NEOCORIO. The Eastern Telegraph Co.'s cable was handed over to the Italian authorities before the present war.

Telephone

The telephone exchange, communicating with the whole island, is in the two eastern towers of FILEREMO.

(12) Defences*(i) Sea Front Defences*

The typical composition of defences is as follows:—

An approach road, not very wide, fairly well maintained; a small barracks of standard model, built on the hillside, invisible from the sea; guns; near guns a range-finder. No enclosure; only notice boards "MILITARY ZONE."

(a) Coast Defence Batteries

No. of Battery.	Name or Position and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	HOTEL DES ROSES—Sited in the garden near the tennis courts.	1—6-in.	B.2	B.2	1940
2	BRUSSALF Cafe, to the southward ..	3—6-in.	B.2	B.2	1941
3	MONTE STEPHANO—To the east and south-east of the hills; these guns are believed to be permanently sited mobile artillery.	7 or 8 ?—4-in.	B.2	B.2	1941
4	CRETAN Wharf—700 yards to the south	1—8-in.	C.3	C.3	1941
5	MALPASSO—These guns are believed to be permanently sited mobile artillery. The two southernmost guns are connected by a trench.	4—? 4-in.	B.2	B.2	1941
6	VILLA REES—These guns are believed to be permanently sited mobile artillery. The two westernmost guns (behind the VILLA REES) are connected by a trench.	4—? 4-in.	B.2	B.2	1941
7	MICSI	? 4—8-in.	Position B.2 No. B.5 A.2	B.2	1940
8	CREMASTO	3—? 6-in.	A.2	B.3	1941
9	M. FILEREMO—On the western side of the plateau.	4—? 6-in.	A.2	B.3	1941

(12) Defences

(i) Sea Front Defences

The typical composition of defences is as follows:—

An approach road, not very wide, fairly well maintained; a small barracks of standard model, built on the hillside, invisible from the sea; guns; near guns a range-finder. No enclosure; only notice boards "MILITARY ZONE."

(a) Coast Defence Batteries

No. of Battery.	Name or Position and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	HOTEL DES ROSES—Sited in the garden near the tennis courts.	1—6-in.	B.2	B.2	1940
2	BRUSSALI Cafe, to the southward ..	3—6-in.	B.2	B.2	1941
3	MONTE STEPHANO—To the east and south-east of the hills; these guns are believed to be permanently sited mobile artillery.	7 or 8 ?—4-in.	B.2	B.2	1941
4	CRETAN Wharf—700 yards to the south	1—8-in.	C.3	C.3	1941
5	MALPASSO—These guns are believed to be permanently sited mobile artillery. The two southernmost guns are connected by a trench.	4—? 4-in.	B.2	B.2	1941
6	VILLA REES—These guns are believed to be permanently sited mobile artillery. The two westernmost guns (behind the VILLA REES) are connected by a trench.	4—? 4-in.	B.2	B.2	1941
7	MICSI	? 4—8-in.	Position B.2	B.2	1940
8	CREMASTO	3—? 6-in.	No. B.5 A.2	B.3	1941
9	M. FILEREMO—On the western side of the plateau.	4—? 6-in.	A.2	B.3	1941
10	M. PARADISO—Sited between two A.A. batteries.	4—? 6-in.	A.2	B.3	1941
11	ANEMOMILI VINARI	5—? calibre (two batteries)	A.3	—	1941
12	MANDRICO	?—? 3.5-in.	Position B.2	B.3	1941
13	MT. SARACHE	3—? calibre	A.3	—	1941
14	SIANA—Probably either at Cape MONOLITHOS or at CHIMARASSE.	?—? 6-in. P.D.	B.2	C.2	1940
15	MONOLITHOS (Village)	4—? calibre (light).	B.2	B.3	1940
16	M. CHIMISALA—Mounted on the high ground about 2,000 yards inland.	?—4-in. (? H.A./L.A.)	B.2	B.3	1940

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(a) Coast Defence Batteries—continued.

No. of Battery.	Name or Position and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
17	APPOLLACHIA—To the west, near the shore.	?—? calibre (light).	B.2	B.3	1940
18	MONTE S. GIOVANNI	?—? calibre (light).	B.3	B.2	1941
19	C. CARAVOLA—Two emplacements exist, and two are under construction.	? 2 or 4—6-in.	A.2	B.2	1941
20	PRASSONISI	?—? 6-in.	B.3	B.3	1942
21	MONTE ORO	? 3—6-in.	Position A.3	B.3	1942
22	PLIMIRA	? 3—6-in.	No. B.2	B.3	1940
23	LACANIA—Position Lat. 35° 57' 10" N., Long. 27° 53' 05" E.	? 3—4-in.	B.2	B.3	1941
24	IANNADI	2 or 3—? 6-in. or 4-in. (may be mobile).	B.2	B.3	1940
25	VATI—Halfway between IANNADI and VATI, on the slopes of the southern two conspicuous hills (1,200 yards west of R. ASCLIPIO).	3—4-in. (? H.A./L.A.)	B.2	B.3	1941
26	R. ASCLIPIO—On the hill on the north-west bank of the river, 2,000 yards from the mouth.	2—4-in.	B.2	B.3	1941
27	PROFETA ELIA (south of LINDOS)	2—? calibre (light).	B.2	B.3	1940
28	LINDOS—West of Cape SUMANI ..	3—6-in.	B.2	B.3	1940
29	LINDOS—South of VLICA	3—6-in.	A.2	B.2	1941
30	R. GADDARA—On the northern bank	?—? (light) (may be mobile).	A.3	B.3	1941
31	CASTEL FERACLO	1—? calibre (light).	B.2	B.3	1940
32	C. ARCANGELO	3 or 4—6-in.	B.2	B.3	1940
33	M. LIVADA	4—? 4-in. or 5-9-in. (? H.A./L.A.)	B.2	B.3	1940
34	M. ZAMBICA	4—? calibre (heavy).	B.2	B.3	1940
35	C. VAHYAH	?—? (light) (may be mobile).	B.2	B.3	1940
36	LUTANI River—a mile to the north ..	?—? calibre (? H.A./L.A.) (may be mobile).	B.2	B.3	1941

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21	MONTE ORO	..	..	..	..	2 or 3—6-in.	Position A.3	B.3	1942
22	PLIMIRA	..	..	..	..	? 3—6-in.	No. B.2	B.3	1940
23	LACANIA—Position lat. 35° 57' 10" N., Long. 27° 53' 05" E.	..	..	..	..	? 3—4-in.	B.2	B.3	1941
24	IANNADI	..	..	..	..	2 or 3—? 6-in. or 4-in. (may be mobile).	B.2	B.3	1940
25	VATI—Halfway between IANNADI and VATI, on the slopes of the southern two conspicuous hills (1,200 yards west of R. ASCLIPIO).	..	..	..	..	3—4-in. (? H.A. L.A.)	B.2	B.3	1941
26	R. ASCLIPIO—On the hill on the north- west bank of the river, 2,000 yards from the mouth.	..	..	..	..	2—4-in.	B.2	B.3	1941
27	PROFETA ELIA (south of LINDOS)	..	..	..	..	2—? calibre (light).	B.2	B.3	1940
28	LINDOS—West of Cape SUMANI	..	..	..	..	3—6-in.	B.2	B.3	1940
29	LINDOS—South of VLICA	..	..	..	..	3—6-in.	A.2	B.2	1941
30	R. GADDARA—On the northern bank	..	..	..	..	?—? (light) (may be mobile).	A.3	B.3	1941
31	CASTEL FERACLO	..	..	..	..	1—? calibre (light).	B.2	B.3	1940
32	C. ARCANGELO	..	..	..	..	3 or 4—6-in.	B.2	B.3	1940
33	M. LIVADA	..	..	..	..	4—? 4-in. or 5.9-in. (? H.A. L.A.)	B.2	B.3	1940
34	M. ZAMBICA	..	..	..	..	4—? calibre (heavy).	B.2	B.3	1940
35	C. VAHYAH	..	..	..	..	?—? (light) (may be mobile).	B.2	B.3	1940
36	LUTANI River—a mile to the north	..	..	..	..	?—? calibre (? H.A. L.A.)	B.2	B.3	1941
37	IEMATICA	..	..	..	..	4—? calibre (may be mobile). (heavy).	B.3	B.4	1940
38	Mt. ASPROPETRA	..	..	..	..	2—?	B.2	B.3	1940
39	ZUCALIA VONO	..	..	..	..	?—? calibre (light).	B.2	B.3	1940
40	M. PEZULA—On the high ground south of COSCHINO.	..	..	..	..	2—6-in.	B.2	B.3	1940
41	TERME d. CALITEA	..	..	..	..	?—? calibre (light).	B.2	B.3	1940
42	CAPE VODI	..	..	..	..	4—6-in.	B.2	B.3	1940
43	CAPE VODI—1,400 yards west of the Point.	..	..	..	..	? 4—? calibre (light).	A.3	B.3	1941

Battery Emplacements

Emplacements, suitable for the mounting of further guns at short notice, exist at M. SAN STEPHANO, M. FILEREMO, M. DEL PROFITA, to the south of AFANDO, and at the springs of CALITEA. There are said to be reserves of guns on the island at RHODES harbour.

Observation Posts

Observation posts have been located as follows :—

- (i) NEOCORIO (near north-eastern extremity).
- (ii) M. STEPHANO.
- (iii) MENGAVLI Hills (defended).
- (iv) VILLANOVA (north).
- (v) CREMASTO (north).
- (vi) M. FILEREMO.
- (vii) ZACUPIRGO (Naval O.P.).
- (viii) GLIPHAHA (defended).
- (ix) C. KAPRIA (defended).
- (x) CALAMI (defended).
- (xi) VALONA (defended).
- (xii) MONOLITHOS (west) (defended).
- (xiii) APPOLLACHIA (defended).
- (xiv) C. CARAVOLA.
- (xv) CATTAVIA (south-west).
- (xvi) C. PRASSO (strongly defended).
- (xvii) PLIMIRA (defended).
- (xviii) LINDOS.
- (xix) CAPE S. EMILIANO (defended).
- (xx) ZAMBICA.
- (xxi) CAPE VAHYAH (strongly defended).
- (xxii) CAPE LADICO (defended).
- (xxiii) CALITEA (on the high ground overlooking KALITHEAS Bay).
- (xxiv) CAPE VODI, on coast $1\frac{1}{2}$ miles to the north (defended).

(e) Local Defence

(a) Wire Entanglements

There exists a system of trenches and barbed wire entanglements, as follows :—

- (i) HOTEL des ROSES to KUM BURNU.
- (ii) BRUSSALI Wharf—CALAVARDA.
- (iii) BRUSSALI Wharf, following a line west of the Town by S. GIOVANNI Barracks through RODINO—ASGURO—TASCHISI—COSCHINO—TERME, di CALITEA.
- (iv) MARIZZA : running north-west to north-north-east for approximately $1\frac{1}{2}$ miles 1,500 yards from the Aerodrome on the north side.
- (v) ZACUPIRGO to KAPRIA Bay.
- (vi) DEMETRIA—PLATANIA—ARCIPOLI.
- (vii) West of CASTELLO, running north and south for 1 mile.
- (viii) C. NISOS—PLIMIRA.
- (ix) $1\frac{1}{2}$ miles south of C. LACANIA to mouth of R. ASCLIPPIO.
- (x) South of VILICA Bay to CASTEL FERRACIO.

- (ix) C. KAPRIA (defended).
- (x) CALAMI (defended).
- (xi) VALONA (defended).
- (xii) MONOLITHOS (west) (defended).
- (xiii) APPOLLACHIA (defended).
- (xiv) C. CARAVOLA.
- (xv) CATTAVIA (south-west).
- (xvi) C. PRASSO (strongly defended).
- (xvii) PLIMIRA (defended).
- (xviii) LINDOS.
- (xix) CAPE S. EMILIANO (defended).
- (xx) ZAMBICA.
- (xxi) CAPE VAHYAH (strongly defended).
- (xxii) CAPE LADICO (defended).
- (xxiii) CALITEA (on the high ground overlooking KALITHEAS Bay).
- (xxiv) CAPE VODI, on coast 1½ miles to the north (defended).

(c) Local Defence.

(a) Wire Entanglements

There exists a system of trenches and barbed wire entanglements, as follows:—

- (i) HOTEL des ROSES to KUM BURNU.
- (ii) BRUSSALI Wharf—CALAVARDA.
- (iii) BRUSSALI Wharf, following a line west of the Town by S. GIOVANNI Barracks through RODINO—ASGURO—TASCHISI—COSCHINO—TERME, di CALITEA.
- (iv) MARIZZA: running north-west to north-north-east for approximately 1½ miles 1,500 yards from the Aerodrome on the north side.
- (v) ZACUPIRGO to KAPRIA Bay.
- (vi) DEMETRIA—PLATANIA—ARCIPOLI.
- (vii) West of CASTELLO, running north and south for 1 mile.
- (viii) C. NISOS—PLIMIRA.
- (ix) 1½ miles south of C. LACANIA to mouth of R. ASCLIPIO.
- (x) South of VLICA Bay to CASTEL FERACLO.
- (xi) M. ZAMBICA to 1½ miles south of C. LADICO.
- (xii) 1½ miles north of C. LADICO to TERME di CALITEA.
- (xiii) Cape VODI to ½ mile south of C. COVA.
- (xiv) Around the Petrol Dump at ZAIRI.

These wire entanglements are well constructed and maintained. A typical arrangement is as follows:—

The defence line consists of two systems of barbed wire, each about 33 ft. deep with five or six rows of wire each. The distance between the two systems varies from 16 ft. to 100 ft. Behind these are the trenches, very well built and covered with netting. All entanglements are sited 200 yards back from the shore on every sandy beach where they are intended as a defence against landings. There are machine gun posts in rear of the beach wire defences. Everything is well kept.

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(b) Land Mines

All Roads and Bridges are being mined. (C.2 : 9/42.)

(g) Magazines, Ammunition Stores, Dumps and Munition Depôts

M. SAN STEPHANO ..

- (1) Magazine and artillery stores: enclosed with barbed wire and permanently guarded; five buildings invisible from sea at summit; corrugated iron roof.
(2) Underground ammunition store.

MALPASSO ..

South of Cretan village: here there are powder mills.

RHODES TOWN OLD CASTLE ..

From Red Gate to Porta Mare: here mines and torpedoes are stored.

RHODES OLD TOWN ..

Just inside the moat in the south-east corner of the old town: a subterranean munition store. (There are reported to be two others inside the town, each of these built in conjunction with a bomb-proof shelter for the civilian population.)

RODINI ..

Ammunition is stored in the catacombs in RODINI gardens, 300 yards west of the W/T station.

MENGAVLI HILL ..

Underground ammunition store.

TRIS IERARCHAE ..

Just outside ASGURO village, near large barracks: here ammunition is stored in a small church.

ASGURO ..

Here there is a store in which spare A.A. guns and machine guns are kept.

PERVOLA ..

Between PERVOLA and ASGURO: an ammunition depôt.

CREMASTO ..

Half a mile from the village: a large ammunition store.

VILLANOVA ..

There is a munition depôt half a mile north-east of the village.

M. FILEREMO ..

Underground munition stores cut out of the hillside.

M. PARADISO ..

Underground ammunition store.

MARIZZA ..

Ammunition dumps in the open adjoining the military hangars.

PSITHOS ..

Sixteen miles south-west of RHODES: here is the main ammunition dump.

MASSARI ..

Underground ammunition store.

SALACO ..

Ammunition depôts.

CAMPO CHIARO ..

Ammunition and other depôts.

DIMILLA ..

Ammunition store.

M. ATTAIRO ..

About 1 mile south of EMBONA village: an important ammunition depôt on the mountain, sited in natural caves and buildings: this depôt probably serves the aerodromes at MARIZZA, CALATO and CATTAVIA.

M. ISIDORO ..

Subterranean galleries for shells, about 1,600 yards to the south of the underground benzine stores on the mountain. There is also a plateau 4 miles from the village. These galleries are sited in a number of sheds camouflaged green and mauve, at least seven of them containing ammunition.

MONOLITHOS ..

Underground munition depôt.

built in conjunction with a bomb-proof shelter for the civilian population.)

RODINI Ammunition is stored in the catacombs in RODINI gardens, 300 yards west of the W/T station.

MENGAVLI HILL .. Underground ammunition store.

TRIS IERARCHAE .. Just outside ASGURO village, near large barracks: here ammunition is stored in a small church.

ASGURO Here there is a store in which spare A.A. guns and machine guns are kept.

PERVOLA Between PERVOLA and ASGURO: an ammunition depot.

CREMASTO Half a mile from the village: a large ammunition store.

VILLANOVA There is a munition depot half a mile north-east of the village.

M. FILEREMO .. Underground munition stores cut out of the hillside.

M. PARADISO .. Underground ammunition store.

MARIZZA Ammunition dumps in the open adjoining the military hangars.

PSITHOS Sixteen miles south-west of RHODES: here is the main ammunition dump.

MASSARI Underground ammunition store.

SALACO Ammunition depots.

CAMPO CHIARO .. Ammunition and other depots.

DIMILLA Ammunition store.

M. ATTAIRO About 1 mile south of EMBONA village: an important ammunition depot on the mountain, sited in natural caves and buildings; this depot probably serves the aerodromes at MARIZZA, CALATO and CATTAVIA.

M. ISIDORO Subterranean galleries for shells, about 1,600 yards to the south of the underground benzine stores on the mountain. There is also a plateau 4 miles from the village. These galleries are sited in a number of sheds camouflaged green and mauve, at least seven of them containing ammunition.

MONOLITHOS .. Underground munition depot.

APPOLLACHIA .. To the north-east: War material and ammunition.

C. CARAVOLA .. Eight underground ammunition stores built into the hill.

CATTAVIA Ammunition store: another between CATTAVIA and C. PRASSO.

M. ORO On the landward side of the hill: five underground galleries for munitions.

PLIMIRA Here there are three underground ammunition depots.

LACANIA On the heights near the road: Underground ammunition store.

IANNADI Ammunition store.

VATHI Ammunition store.

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PILONA (1) .. One mile north-east of PILONA Village, on the main road to LINDOS, an important underground ammunition depôt. It is sited in a horse-shoe shaped clearing 100 yards by 80 yards, cut in a hill south of and alongside the road. The ammunition is stored in 12 compartments, the entrances to which are in the circumference of the clearing, the compartments themselves being in the rock. The galleries are connected by underground passages. The dimensions of each compartment are 38 ft. by 15 ft. and the contents, when seen in October, 1939, were shell and boxes of ammunition.

PILONA (2) .. In the woods near PILONA: four underground munition galleries. One gallery, which communicates with the other three by means of a passage, is about 870 yards long. Munitions are brought to the top of the hill by a perpendicular hoist which connects with the gallery.

LINDOS .. On the high ground to the west of the town: underground ammunition store.

CALATO .. To the south of the village: underground ammunition store.

LINDOS-CALATO .. Underground ammunition and bomb stores in the galleries behind the barracks at the aerodrome; 350 yards inland from the aerodrome, at a place surrounded by a stone wall, there are seven buildings; one of them, three-floored, and about 200 yards from the others, is an ammunition depôt.

AFANDO .. One mile south of the village: 120 ft. deep in the side of TRAPEZIA hill.

ISLAN DAGH .. Explosives.

KANDIA .. South of port of RHODES, near a flour mill: an ammunition depôt.

KANDIA BAY .. 200 yards south of the south-east of KANDIA Bay munition stores in concrete buildings.

(ii) *Mobile Defences*

See DODECANESE—GENERAL.

A large number of machine guns have been mounted on motor vehicles as a measure of anti-parachutist defence. (C.2: 1942.)

Mobile guns have also been sighted at the following places:—

(i) ASGURO, to the north, on each side of the road. Small guns or light field guns.

(ii) CREMASTO .. Field guns.

(iii) M. FILEREMO .. Field guns.

(iv) M. PARADISO .. Field guns.

(v) SORONI .. Field guns.

(vi) FANE .. Field guns.

(vii) CALAVARDA .. Field guns.

(viii) CAMPO CHIARO .. Machine guns and field guns and about 30 tanks.

(ix) CAMIRO .. Field guns.

(x) PATELLA .. Machine guns.

(xi) MANDRICO .. Field guns.

LINDOS perpendicular hoist which connects with the gallery.
 On the high ground to the west of the town: underground ammunition store.

CALATO To the south of the village: underground ammunition store.

LINDOS-CALATO Underground ammunition and bomb stores in the galleries behind the barracks at the aerodrome: 350 yards inland from the aerodrome, at a place surrounded by a stone wall, there are seven buildings: one of them, three-floored, and about 200 yards from the others, is an ammunition depôt.

AFANDO One mile south of the village: 120 ft. deep in the side of TRAPEZIA hill.

ISLAN DAGH Explosives.

KANDIA South of port of RHODES, near a flour mill: an ammunition depôt.

KANDIA BAY 200 yards south of the south-east of KANDIA Bay munition stores in concrete buildings.

(ii) Mobile Defences

See DODECANESE—GENERAL.

A large number of machine guns have been mounted on motor vehicles as a measure of anti-parachutist defence. (C.2: 1942.)

Mobile guns have also been sighted at the following places:—

(i) ASGURO, to the north, on each side of the road. Small guns or light field guns.

(ii) CREMASTO	Field guns.
(iii) M. FILEREMO	Field guns.
(iv) M. PARADISO	Field guns.
(v) SORONI	Field guns.
(vi) FANE	Field guns.
(vii) CALAVARDA	Field guns.
(viii) CAMPO CHIARO	Machine guns and field guns and about 30 tanks.
(ix) CAMIRO	Field guns.
(x) PATELLA	Machine guns.
(xi) MANDRICO	Field guns.
(xii) CASTELLO	Machine guns and movable naval guns.
(xiii) MONTE S. GIOVANNI (CATTAVIA)	Field guns.
(xiv) STAVROTI Ridge	Two batteries of 75 mm. field guns.
(xv) Cape NISOS to R. ASCLIPIO	Field guns at intervals alongside coast.

(These include small guns or light field guns at S. GIORGIO and S. GIOVANNI Monasteries, north of LACANIA.)

(xvi) PILONA	Two 75 mm. field guns.
(xvii) VIGLIKA Bay	Small guns or light field guns and machine guns.
(xviii) Near ELEUSSA Monastery	Field guns.
(xix) Villa MARINA, to the south, on the west side of the coast road.	Machine guns.
(xx) COVA	About 20 light tanks. (C.3.)

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(iv) Local Seaward Defences

Mines have been laid outside RHODES Harbours from KANDIA Point to the Tower of S. NICOLA, with a further section across the entrance to MANDRACHI Harbour.

Booms and nets. An anti-submarine boom defence is in position at RHODES Harbour.

(v) Local Air Defences

(a) A.A. Batteries

No. of Battery.	Name or Location.	Armament.	Grading.	Date of Latest Report.
1	Molo CERVO	2—? (light)	A.2	1941
2	Governor's Palace	4—? (heavy)	A.2	1941
3	La PUNTA	2 4—? 3-in.	B.3	1940
4	MONTE STEPHANO—On the ridges	2 6 to 8 (possibly more) P.D. heavy calibre)	B.3	1941
5	C. dei PINI—Western slopes of MENGAVLI Hill	4—? (heavy)	A.2	1941
6	ASGURO—North of the heights	2—? 4-in.	B.3	1941
7	ASGURO, east and west of the heights.	4—? (heavy) (2 batteries of 2 guns)	B.3	1941
8	ASGURO—South-west of the heights	4—? (heavy)	A.2	1941
9	M. FILEREMO—Eastern plateau	2 4 or 8—? (heavy)	A.3	1941
10	CREMASTO	2—? (heavy)	B.3	1941
11	M. PARADISO—A battery on each side of the C.D. battery.	2—? (light)	A.2	1941
12	PASTIDA—On the high ground east of village.	8—? (heavy) (2 batteries of 4 guns).	B.3	1940
13	PASTIDA—South-west of village	2 4—? 3-in.	B.3	1940
14	MARITZA—200 yards N.W. of village.	2 4—? 3-in.	B.3	1940
15	TOLO	2—?	B.3	1940
16	MT. ENEA	3—?	C.3	1941
17	CAMPOCHIARO—Sited at M. PRO. FETA ELIA - APPOLLONIA - PLATANIA-S. DEMATRIA	2—?	B.3	1941
18	CASTELLO—On high ground north of town.	2—3-in.	B.3	1941
19	M. COCHINE	2—? (heavy)	A.3	1941
20	S. ISIDORO—Sited at Mo di ISIDORO. AZOPETI. SAN ISIDORO. KARI. PITHANA. LITTARI. Mt. CORTILONA. MADONNA. ALAERMA. S. GIOVANNI.	2 24—? calibre	B.3	1941
21	APPOLLACHIA	2—? (heavy)	B.3	1941
22	APPOLLACHIA—Sited at Hill 164	2—?	B.3	1940
23	ARNITA	9—? (light)	B.3	1941
24	MT. SCHIATI	2—?	A.2	1941
25	M. VIGLA—Position 35° 56' N. 27° 47' 42" E.	4—? (heavy)	A.2	1941
26	M. VIGLA—position 35° 55' 50' N. 27° 47' 42" E.	4—? (heavy)	A.2	1941
27	STAVROTI—Sited Hill 222	2 4—? 3-in.	B.3	1941
28	CATTAVIA—East of aerodrome	8—? calibre (3 batteries)	B.3	1941
29	CAPE FOCA—2,000 yards north-west of the Point.	2—? calibre (2 batteries)	B.3	1941
30	LINDOS—On high ground to the west.	2—? calibre	B.3	1941
31	South of VLICA Bay, between LINDOS-CALATONI and the	4—? (heavy)	A.2	1941

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(b) Mobile A.A. Defences

- (i) M. YARO: ten guard houses constructed on the ridge are armed with heavy A.A. machine guns.
- (ii) C. PRASSO: The observation post is possibly defended with A.A. machine guns.
- (iii) M. ZAMBICA: The Naval Look-out Post is armed with heavy A.A. machine guns.

(c) A.A. Searchlights

Two powerful searchlights have been mounted on M. SAN STEPHANO. (C.3.)

(d) A.A. Control Post

The City Siren Control and Look-out Posts are situated close to the Coast road at the northern extremity of M. SAN STEFANO.

(viii) Garrison

The number of troops on the Island is believed to be about 27,000.

(13) Reconnaissance

See Revised Plans 71, 72, 114 and 115. Until these are distributed, refer to sketches: 5 A.A, 5 B.B, 5 C.C, 5 D.D, 5 E.E, 5 U, 5 V, 5 W, 5 X, 5 Y and 5 Z, and Photographs: 5 F.F, 5 G.G, 5 H.H, 5 J.J and 5 K.K, issued by M.M.N.I.C., dated 9.4.41.

This report, except as otherwise indicated, is graded A.1 and dated April, 1941.

It should be read in conjunction with the above-mentioned Plans and paragraph (12) DEFENCES.

1. "A" BEACH: from Punta del LAZARETTO to Capo della SABIA (see Plan 114, sketches Nos. 1, 2, 3, 4 and 5).

(a) Recognition and Approach (see Plan 114, sketches 2 and 3).

This beach is obviously easy to find. However, the low land does not show up well over 2 miles away at night. So if it is desired to approach direct head on to the beach, the following is recommended:—

The north-western steep slope of the rising ground, Monte STEPHANO, which is not shown clearly on the chart, to the west of the town should be brought in transit with the left shoulder of Monte FILEREMO, flat top, bearing approximately S.50°W. (Magnetic) (see Plan 114, sketch No. 2).

Monte PARADISO will appear like a breaking wave a little to the right of Monte FILEREMO.

When the "Hotel des ROSES," which is the northernmost large rectangular block on the Island, is seen, steer for that. It is opposite the centre of the beach.

The northernmost Villa and light structure must be seen clear to starboard when near the beach, otherwise it is possible to run past in the dark (see Plan 114, sketch No. 3).

(b) Landing, Beach Obstructions, etc.

- (1) Underwater.—Excellent and steep-to in centre 200 yards of beach, where gradient is 1 in 6 underwater.

Along a section of the beach, indicated on Plan 114, sketch No. 5, are the remains of a wooden jetty and some broken concrete slabs just about sea level. These make the landing here awkward. They are not difficult to see from close off shore.

Abreast the Northern Villa the beach is clear but the gradient underwater is less steep, perhaps 1 in 9.

Throughout, the bottom immediately below the water's edge is hard sand.

(13) **Reconnaissance**

See Revised Plans 71, 72, 114 and 115. Until these are distributed, refer to sketches: 5 A.A, 5 B.B, 5 C.C, 5 D.D, 5 E.E, 5 U, 5 V, 5 W, 5 X, 5 Y and 5 Z, and Photographs: 5 F.F, 5 G.G, 5 H.H, 5 J.J and 5 K.K, issued by M.M.N.I.C., dated 9.4.41.

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Along a section of the beach, indicated on Plan 114, sketch No. 5, are the remains of a wooden jetty and some broken concrete slabs just about sea level. These make the landing here awkward. They are not difficult to see from close off shore.

Abreast the Northern Villa the beach is clear but the gradient underwater is less steep, perhaps 1 in 9.

Throughout, the bottom immediately below the water's edge is hard sand.

Abreast the southern end of the hotel is a reinforced concrete skeleton pier, which ends in about 6 ft. of water. It is useless without alteration (see Plan 115).

The good underwater section of the beach extends to perhaps 40 yards south of this mark.

Roughly abreast this latter point and about 60 yards off shore stands a high diving board erection. This appears to mark the northern limit of inshore shoals. South-East of this, although the beach appears the same, there are rocky ledges off shore with as little as 2 ft. of water over them in some cases, and water up to 6 ft. deep inshore of them. The shoals are of fairly soft rock, weed covered.

This section might be navigated by a detached A.L.C. or S.L.C. but only with care and with a "shoving off" party ready to jump overside.

The foundations of a stone jetty have been built from Punta de LAZZARETTO (see Plan 114, sketch No. 5). The top is almost awash and may sometimes be submerged. In calm weather and when "dry," craft could go alongside it without damage.

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Until extent of the shoals are better known, craft should be warned to leave the high diving board erection and SCOGLIA COLONNA to the south when passing from "A" beach to harbours. SCOGLIA must be given a wide berth (*see* Plan 114, sketches Nos. 3 and 5).

(ii) *Above Water*.—Along the whole length except by the concrete slabs the first 30 ft. of above-water beach consists of small shingle of only moderate looseness. The gradient is steeper than below water for about 8 ft. About 1 in 3 or 4. Then much less.

Above this sand alternates with the shingle in bands or ridges. It is fairly hard but M.T. would probably require beach roadway of some sort. The top of the beach is mostly sand.

Tanks can go anywhere if they can overcome the first steeper bank of loose shingle: this appears probable.

There are a number of wooden piles about 1 ft. square and protruding from 6 in. to 1 ft. These were evidently bathing hut foundations and stand between 4 and 8 ft. apart (*see* Plan 114, sketches Nos. 3 to 5). It is doubtful whether they would prove an anti-tank obstacle.

Finally at the back of the beach, there stretches a low "seawall." It is nowhere more than 3 ft. high, and seems to get lower or disappears near the North Point (*see* Plan 114, sketch No. 5).

The fencing above the wall north of the hotel and also in the gap between the first long building and its neighbour to the east seems unsubstantial. There is heavier fencing between the hotel and the above building as shown on Plan 114, sketch No. 4.

There is a locked double gate about 7 ft. across it, 50 yards or so south-east of the hotel with steps leading up to it.

(c) *Defences* (*see* Plans 71 and 72)

Active.—No guns or pill boxes of any sort are visible when Punta del LAZARETTO and its buildings are against the skyline at 20-30 yards range. No sandbags visible. There are probably M.G.s in the buildings and it is suspected that there is a sentry at the base of this point.

There are sentry posts in front of the hotel, and also one or more on the point.

No C.D. guns or obvious pill boxes are visible on the point, but there is plenty of cover, houses, etc., for M.G.s: no searchlights visible anywhere near beach.

The public is evidently not admitted to the beach.

(*Note*.—A report, graded B.2 1940, places a 6-in. gun in the garden of the Hotel des ROSES. (*See* Plan 72.))

Passive.—There are no artificial underwater obstructions. There are no mines, anti-personnel or anti-tank, on the wing sections of the beach. Tracks as of sentries lead longitudinally from these sections towards the centre section in front of the hotel. There are no ropes or other barriers to mark off or divert these tracks from the centre section and it appears that there are no mines in this section.

There is a moderate wire entanglement against the seawall south-east of the hotel: it does not appear very formidable (*see* Plan 114, sketch No. 4).

It appears to extend along the top of the rest of the beach. It may be more elaborate in front of the hotel itself where there is no seawall backing it, but this is doubtful.

There appears to be no wire on Punta del LAZARETTO.

(d) *Exits*

(i) The most obvious exit for tanks is to get off the beach in front of the hotel and within 100 yards or so north of it, where there is no seawall.

Thence pass through the fence, or gate, on to the roads north or south-east of the hotel.

family at the back of the beach, there stretches a low seawall. It is nowhere more than 3 ft. high, and seems to get lower or disappears near the North Point (see Plan 114, sketch No. 5).

The fencing above the wall north of the hotel and also in the gap between the first long building and its neighbour to the east seems unsubstantial. There is heavier fencing between the hotel and the above building as shown on Plan 114, sketch No. 4.

There is a locked double gate about 7 ft. across it, 50 yards or so south-east of the hotel with steps leading up to it.

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There is a moderate wire entanglement against the seawall south-east of the hotel: it does not appear very formidable (see Plan 114, sketch No. 4).

It appears to extend along the top of the rest of the beach. It may be more elaborate in front of the hotel itself where there is no seawall backing it, but this is doubtful.

There appears to be no wire on Punta del LAZARETTO.

(d) Exits

(i) The most obvious exit for tanks is to get off the beach in front of the hotel and within 100 yards or so north of it, where there is no seawall.

Thence pass through the fence, or gate, on to the roads north or south-east of the hotel. There may be a low 3-ft. wall between hotel "grounds" and public roads but none is visible.

It is not known whether there are any mines in the hotel grounds.

(ii) A gap 200 yards west of Punta LAZARETTO (see Plan 114, sketch No. 5) might be the easiest place to get over the seawall as:—

(a) Enemy guns from the other wing of the beach might hesitate to fire at tanks waiting there and troops working in the gap for fear of hitting their friends in the houses by the gap.

(b) Enemy in the above buildings could probably not fire at men working in the gap. If they did, tanks waiting under the houses could probably quell them from short range.

A disadvantage of this gap is that M.L.C. and above cannot land in front of it and it would probably be risky to send A.L.C. there owing to shoals.

(iii) Troops landing on the North Point itself and leaving the beach there could not be taken in enfilade by anyone.

(e) Suggestion

It has been suggested that (i) any guns or M.G. on Punta del LAZARETTO could be taken in rear by sending an A.L.C. Tommy gun party to land on the new jetty foundations if calm, or on the north side of the point on rocks. These men should preferably wear rope-soled shoes and extra lifebelts. Should the craft ground on ledges a few yards off shore, they must jump in and splash through water from 3 to 6 ft. deep before reaching the land.

This A.L.C. should approach between SCOGIA COLONNA and the new jetty foundations which may be awash, then keep fairly close to the new jetty until landing, in order to avoid grounding early. Or go alongside the south-east side, if weather permits.

Or:—(ii) If ramps are not available for tanks to surmount 3 ft. seawall, a ramp could fairly soon be made by filling empty bags with sand on the spot.

No guns or M.G.s are visible near the northernmost villa; the presence of C.D. guns is very doubtful (see note in paragraph (c) above).

(f) "A.1" Landing. (See Plan 114, sketch No. 5.)

Between Punta del LAZARETTO and S. NICOLA Tower, just north of MANDRACCIO Harbour.

There appears to be no large calibre (6-in. or above) guns on S. NICOLA Tower or the Mole.

There is no boom between that Tower and Punta LAZARETTO and it is doubtful if there is any between the MANDRACCIO Harbour piers. (Booms have subsequently been reported. See Plan 72.)

The garden in front of the Government Offices has been extended by reclamation to the eastward and terminates in a low quay. From the chart the depths alongside this quay should be of the order of 2 to 3 ft. but it may have been dredged much deeper. (See Plan 114, sketch No. 5.)

The corner at the south end of this might be a good place to land if exits are considered suitable.

2. "B" BEACH: South of Cape COVA (see Plans 72 and 114, sketches Nos. 6, 7 and 8).
(Lat. $36^{\circ} 25' 30''$ N., Long. $28^{\circ} 16' 45''$ E.)

(a) Recognition and Approach. (See Plan 114, sketch No. 6.)

This is a difficult beach to find, particularly as there is usually a northerly set of about a knot inside the 100-fathom line.

Monte FILEREMO (flat top) is the only mark and requires good glasses.

Approach, keeping the south shoulder bearing S. 75° W. magnetic, allowing for the current.

The mountain disappears behind the nearer skyline some way before the beach is reached. Continue on the course until the right edge of land bears due north then steer for that, keeping it bearing north. This will keep the craft $\frac{1}{2}$ mile off beaches to westward, while approaching the grassy rocky spit north-east of Cape COVA.

If the land cannot be brought to bear north without approaching the breakers to the westward too closely, it will indicate that the craft has been set north of the spit, north-east of "B" beach. This can be confirmed by:—

- (i) A large, very conspicuous square block just south-east of Bay of ACANDIA (yellow by day). Beyond this the citadel and town may appear.
- (ii) A very thick, tall factory chimney $\frac{1}{2}$ mile south of (i).

Between Punta del LAZARETTO and S. NICOLA Tower, just north of MANDRACCIO Harbour.

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Monte FILEREMO (flat top) is the only mark and requires good glasses.

Approach, keeping the south shoulder bearing S. 75° W. magnetic, allowing for the current.

The mountain disappears behind the nearer skyline some way before the beach is reached. Continue on the course until the right edge of land bears due north then steer for that, keeping it bearing north. This will keep the craft $\frac{1}{4}$ mile off beaches to westward, while approaching the grassy rocky spit north-east of Cape COVA.

If the land cannot be brought to bear north without approaching the breakers to the westward too closely, it will indicate that the craft has been set north of the spit, north-east of "B" beach. This can be confirmed by:—

- (i) A large, very conspicuous square block just south-east of Bay of ACANDIA (yellow by day). Beyond this the citadel and town may appear.
- (ii) A very thick, tall factory chimney $\frac{1}{4}$ mile south of (i).
- (iii) The fact that skyline to the west is not very high and consists of almost continuous fair-sized buildings instead of higher continuous hill ridge with only occasional buildings.

The spit itself is low and not easily discerned.

When sure that the craft is south of the spit, and while slowly approaching it, search for three W/T masts on skyline above the beach.

If these can be seen, turn in towards them when they bear about S. 65° W. magnetic and land on courses between N.W. and W. in the bay, east and north-east of the cemetery.

If the W/T masts cannot be seen the landing must be judged by the distance off the spit and a good idea of the lie of the land must be borne in mind.

"B" Beach proper appears crescent shaped, just north of some darker higher ground which comes down to the water's edge.

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(b) Landing, Beach Obstructions, etc.

(i) *Under water*.—The depth of water decreases rapidly to soft stone flat ledges along whole beach. These are anything from 2 ft. to zero under the surface. The submerged ledges are weed-covered, without sharp points.

It is considered that in fair weather craft could ground on these without damage. With this proviso the northern 800 yards of beach is suitable. There are other beaches to the south.

These ledges stretch for 30 yards to the sand beach proper. In between the ledges are slightly deeper sand-filled pools with steep sides. The deepest of these is 2 ft. deep water and might prove an obstacle to M.T. without the help of planks or sandbags. They are no obstacle to tanks or infantry. There are places where M.T. could get across.

Troops must be prepared to disembark into 2 ft. of water.

Where these rocky flats are above water they provide some cover (rather wet).

(ii) *Above water*.—The sand, once reached, is hard and stony: cart tracks run across it. There are no obstacles to M.T. which can get off the beach by the roads. (See Plan 114, sketch No. 7.) The gradient is gradual.

A few of the steeper parts of the sandhills are soft. These hills provide some cover and there are also a few shrubs.

High piles of kelp give visual cover.

(c) Defences. (See Plans 71 and 72, and sketches Nos. 7 and 8.)

(i) *Passive—Under water*.—Nil.

Above water.—There appear to be no mines of any sort on the beach, as cart tracks and footmarks were visible on it.

There is a wire entanglement: presumably it continues west and south along the main road (see Plan 114, sketches Nos. 7 and 8).

(ii) *Active*.—There may be a sentry on the road bridge over the dry stream.

There is probably a guard of some strength at the Military Post, judging by lights showing and talking going on. No C.D. guns visible.

The beach is well covered by this Post. On the other hand the Post is well covered from the sand hills.

There appear to be no other posts in the area covered by Plan 114, sketch No. 7.

(d) *Exits*

Exits are by the track and road (see Plan 114, sketch No. 7). These presumably are wire-blocked where they join the main roads: position uncertain.

At night infantry should easily be able to get through the wire guarding the main road. M.T. could probably not get out on to the main road here without help as the sand bank is soft.

This road is partly enfiladed by the Military Post.

The exit south of the cemetery may be the best. It looks suitable through a periscope from seaward.

(e) *Suggestion*

That an A.L.C. with a special party should take the Military Post on the spit in rear, as outlined for Punta del LAZARETTO by "A" Beach.

3. "C" BEACH: KALITHEAS BAY, Southern part (see Plan 114, sketches Nos. 9 and 10).
Reconnaissance graded A.3, dated April, 1941 (terminated early by grounding on uncharted 7-fathom shoal: 205° 2-4' from C. VUDHI).

A few of the steeper parts of the sandhills are soft. These hills provide some cover and there are also a few shrubs.

High piles of kelp give visual cover.

(c) *Defences.* (See Plans 71 and 72, and sketches Nos. 7 and 8.)

(i) *Passive—Under water.*—Nil.

Above water.—There appear to be no mines of any sort on the beach, as cart tracks and footmarks were visible on it.

There is a wire entanglement: presumably it continues west and south along the main road (see Plan 114, sketches Nos. 7 and 8).

(ii) *Active.*—There may be a sentry on the road bridge over the dry stream.

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3. "C" BEACH: KALITHEAS BAY, Southern part (see Plan 114, sketches Nos. 9 and 10).
Reconnaissance graded A.3, dated April, 1941 (terminated early by grounding on uncharted 7-fathom shoal: 205° 2.4' from C. VUDHI).

(a) *Recognition and Approach*

South-east approach is easy (see Plan 114, sketches Nos. 9 and 10). Monte GALLATAH can be distinguished. There are, however, other flat top hills, though not very similar.

While still some way out, Monte FILEREMO (sloping flat top) (see Plan 114, sketch No. 9) appears dimly north of Monte GALLATAH: this should remove all doubt.

If, however, these marks cannot be seen, it is recommended to close C. LADHIKO (or LADICO), remarkable by reason of ERRIMO Castro and Monte APHANDROS to the south of it. Keep ½ mile off shore and work N.W. and into south of KALITHEAS Bay. The first (southernmost) obvious large valley in the coast range of hills will be "C" Beach, if Monte GALLATAH is seen behind it on the bearing of N. 60° W. Magnetic, Monte GALLATAH should always be visible at this distance.

Approach beach keeping Monte GALLATAH ahead on this bearing.

(b) *Landing*

Appeared very good: sandy: great length of beach.

(c) *Defences*

One line of wire entanglement was seen in the scrubby stony ground off the beach: it runs all along the coast, and is not very heavy.

There is possibly another line, 50 or 100 yards behind the first.

No pill boxes, military, etc., were seen in the vicinity.

(d) *Exits*

A good road was seen $\frac{1}{2}$ mile behind the beach running downhill northwards. There is easy exit from the beach over flat, stony, sandy ground, with low shrub and olives inland: probably negotiable by M.T. with care. Sand tracks should be taken.

4. "D" BEACH: APHANDOS (or AFANDO) BAY: central part east of AFANDO village (see Plan 114, sketch No. 9.)

Reconnaissance graded A.3, and dated April, 1941: no landing.

(a) *Recognition and Approach*

Very difficult with any accuracy to approach an exact point.

Approach from N.E. as for "E" Beach, *i.e.*, on Monte PLAIA VUNO which is indicated on the chart in position $325^{\circ} 1.0'$ from Monte ZAMBICA ($36^{\circ} 14' N.$, $28^{\circ} 11.3' E.$) (see Plan 114, sketch No. 9.)

Monte PLAIA VUNO should be brought to bear $S. 65^{\circ} W.$ Magnetic and approached thus:—

When the south-western or left shoulder of Monte APHANDOS bears $N. 45^{\circ} W.$ steer for it on that bearing. It is clearly seen "stepped" high ground though not very remarkable from this slew (see Plan 114, sketch No. 9).

This will give a landing on a good beach about $\frac{1}{2}$ mile north of the dry river mouth which can only be found by walking along the beach.

However, after a short while on the new course, $N. 45^{\circ} W.$ Magnetic, it should be possible to observe on the port bow through glasses a distinct though inconspicuous flat top hill. It is about one-third the way between Monte APHANDOS and Monte PLAIA VUNO, nearer the former. It will not be seen until less than 1 mile off shore, *i.e.*, until it has cleared the skyline of the plateau behind it. It then appears fairly clearly to the north of the two gentle breast-like mountains in the distance (see Plan 114, sketch No. 9). The northern of these two is the lower and soon disappears behind the skyline.

To the north of the single flat top and the same distance from the beach is a much longer and more or less flat-topped hill of the same height. This has a somewhat divided top, and should not be confused with the one intended. This latter has St. ELIA Chapel on top of it (invisible by night) and is faintly indicated on chart in position $168^{\circ} 0.5'$ from APHANDOS Church.

If St. ELIA Chapel Hill can be made out surely, a much more accurate landing can be effected; steer for it when it comes to bear $N. 70^{\circ} W.$ Magnetic. This will achieve a landing 400 yards north of the river bed.

N.B.—This mark may be useful also to the military when landed as the dry bed itself is not easy to make out, being partly bush covered. At the point where the river bed joins the sea, this St. ELIA Chapel Hill bears $N. 55^{\circ} W.$ Magnetic.

(b) *Landing, Beach Obstructions, etc.*

Landing appears good on to a sandy beach. There are no obstructions on the beach which extends the whole length of bay.

(c) *Defences*

Single wire entanglement only is probable. It appears to run through bushes in stony ground behind the beach throughout the whole length of bay.

Very difficult with any accuracy to approach an exact point. Approach from N.E. as for "E" Beach, i.e., on Monte PLAIA VUNO which is indicated on the chart in position 325° 1' 0" from Monte ZAMBICA (36° 14' N., 28° 11' 3" E.) (see Plan 114, sketch No. 9.)

Monte PLAIA VUNO should be brought to bear S. 65° W. Magnetic and approached thus:— When the south-western or left shoulder of Monte APHANDOS bears N. 45° W. steer for it on that bearing. It is clearly seen "stepped" high ground though not very remarkable from this slew (see Plan 114, sketch No. 9).

This will give a landing on a good beach about ½ mile north of the dry river mouth which can only be found by walking along the beach.

However, after a short while on the new course, N. 45° W. Magnetic, it should be possible to observe on the port bow through glasses a distinct though inconspicuous flat top hill. It is about one-third the way between Monte APHANDOS and Monte PLAIA VUNO, nearer the former. It will not be seen until less than 1 mile off shore, i.e., until it has cleared the skyline of the plateau behind it. It then appears fairly clearly to the north of the two gentle breast-like mountains in the distance (see Plan 114, sketch No. 9). The northern of these two is the lower and soon disappears behind the skyline.

To the north of the single flat top and the same distance from the beach is a much longer and more or less flat-topped hill of the same height. This has a somewhat divided top, and should not be confused with the one intended. This latter has St. ELIA Chapel on top of it (invisible by night) and is faintly indicated on chart in position 168° 0' 5" from APHANDOS Church.

If St. ELIA Chapel Hill can be made out surely, a much more accurate landing can be effected: steer for it when it comes to bear N. 70° W. Magnetic. This will achieve a landing 400 yards north of the river bed.

N.B.—This mark may be useful also to the military when landed as the dry bed itself is not easy to make out, being partly bush covered. At the point where the river bed joins the sea, this St. ELIA Chapel Hill bears N. 55° W. Magnetic.

(b) Landing, Beach Obstructions, etc.

Landing appears good on to a sandy beach. There are no obstructions on the beach which extends the whole length of bay.

(c) Defences

Single wire entanglement only is probable. It appears to run through bushes in stony ground behind the beach throughout the whole length of bay.

No other fixed defences are likely.

(d) Exits

Good on to the stony river bed: this, with care, appears suitable for M.T. Sand tracks should be taken.

5. "E" BEACH: South part of APHANDOS BAY, near CAPE VAHYAH (see Plan 114, sketches Nos. 9 and 11).

(a) Recognition and Approach

Easy. The Mark is Monte PLAIA VUNO, indicated on the chart in position 325° 1' from the remarkable Monte ZAMBIKA, Lat. 36° 14' N., Long. 28° 11' 3" E.

(See Plan 114, sketch No. 9.) Bring this mountain to bear S. 65° W. Magnetic, and approach thus.

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Then, approaching on this bearing, when the high cliffy end of the land east of Monte ZAMBIKA comes clear to the west of the low cliffy inner edge of Cape VAHYAH promontory, bearing about S. 15° W. Magnetic (see Plan 114, sketch No. 11), the craft will be about 1/4 mile from the beach and 6 cables clear of defence guns, if any, on the promontory. Alter course to west and a landing will be effected about 1/3 miles north of river mouth.

(b) Landing, Beach Obstructions, etc.

Gradient underwater is 1 in 10: bottom is of large, flat stones which is quite safe for beaching in fair weather.

Above water, beach is of shingle and firm sand. The beach roadway should be landed for M.T. only as a precaution.

There are no obstructions on beach.

The water in the immediate vicinity of the inner side of C. TEODOCO (C. VAHYAH) promontory is shoal for a long way out and should be avoided.

(c) Defences

Underwater.—Nil.

Above water.—No anti-personnel mines, probably no A/T mines.

Wire.—Entanglement similar to that shown on Plan 114, sketch No. 4, but without the high wire: posts at 20 ft. intervals and infirm. The wiring is not formidable and runs along the back of the beach 60 yards to 100 yards behind the waterline, and straight across the dry river bed as far as the cliffs of C. TEODOCO promontory (C. VAHYAH).

There it disappears amongst what looks, in silhouette, like stone laagers and houses, etc., probably M.G. posts.

In front of the wire at intervals there are lengths of loose stone breastwork about 3 ft. thick and 2 ft. high.

Apparently no look-out is kept, but it is considered that there is a military post on the promontory.

No C.D. battery could be seen on C. TEODOCO, and the existence of guns is very doubtful unless they are on disappearing mountings. A cairn on a high point which might be Observation Post.

Note.—A battery (? light mobile) was reported here in 1940, graded B.2.

(d) Exits

Exit is through the wire along the river bed. The surface is firm sand and shingle but with numerous small washaways. There is no hindrance to tanks but M.T. should carry sand tracks, and should then be able to get through easily.

There is a stone-arch bridge across the river; this has presumably replaced the causeway mapped.

6. "F" BEACH: CAPE VAYHAH (or TEODOCO)

Reconnaissance (graded A.3 and dated April, 1941), range 1/2 mile.

(a) Recognition and Approach. (See Plan 114, sketch No. 9.)

From the north-east it is very easy. Approach on a suitable bearing of the conspicuous Monte ZAMBIKA and turn to W.N.W. when past C. VAHYAH, landing north of high cliffs west of ZAMBIKA.

(b) Landing

Sand: it appears good along the whole length: it is backed by low cliff with gaps: narrow beach.

(c) Defences

C. TEODOCO (C. VAHYAH) promontory appears to be a military post. There are

Above water.—No anti-personnel mines, probably no A/T mines.

Wire.—Entanglement similar to that shown on Plan 114, sketch No. 4, but without the high wire: posts at 20 ft. intervals and infirm. The wiring is not formidable and runs along the back of the beach 60 yards to 100 yards behind the waterline, and straight across the dry river bed as far as the cliffs of C. TEODOCO promontory (C. VAHYAH).

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(b) Landing

Sand: it appears good along the whole length: it is backed by low cliff with gaps: narrow beach.

(c) Defences

C. TEODORO (C. VAHYAH) promontory appears to be a military post. There are probably no C.D. guns (a light (? mobile) battery was reported here in 1940, graded B.2).

There is no wire on the beach, but there may be one line of wire a short distance inland of the low cliffs.

(d) Exits: General Background

There is a line of cliffs 15 ft. high behind the beach but there are several breakdowns giving exits to infantry and three or four for tanks, including one at the north end where a rough road runs down to the beach.

In a roughly N.E.-S.W. direction across the flat grassy land behind the beach there runs a low-arched aqueduct (?) which would be an obstacle but there seemed to be a track beside it as a cyclist was seen. A farm cart was also seen, so there must be some sort of road across it, particularly as the numerous villas were new and Italian, not Greek, looking.

There is a large, rambling, modern, yellow establishment with a tower. This is possibly a barracks.

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7. "F.2" BEACH: South of Monte ZAMBIKA (ARCHANGELO BAY).

The beach immediately south of Monte ZAMBIKA is apparently good for landing in its southern half where the sand extends a long way inland and up hill. The exit is steep but should be easy for infantry.

Curiously enough this beach has a double line of wire, the outer light, about 50 yards in, the inner moderately heavy, about 200 yards further up the slope.

There must be some reason for this.

Possible explanations are:—

- (i) That there is a battery in the hills above, or
- (ii) There is a double line all along the coast, but the inner one is well inland where one cannot see it, except at this point where the beach stretches well inland.

The following report is graded C.O.

8. "G" BEACH: CARACCIO-LINDOS

This area is protected by high ground and coastal batteries at LINDOS and ARCHANGELO which bring cross-fire to bear.

Bridge-head would be difficult to establish: the only line of advance would be frontal approach against strongly-defended heights or inland through narrow defiles.

From CARACCIO to the mouth of the ENDARO river there are cultivated plots behind the beach.

This strip of shore lies between the fortified zones and batteries on Mounts ARCHANGELO and LINDOS. Although suitable for the disembarkation of a force, the impossibility of establishing bridge-heads would necessitate an advance through mountain passes and even if to avoid this an attack from the rear were resorted to, it would be an extremely difficult operation offering, for a first landing, little chance of success.

9. "H" BEACH: C. MERMINGA-C. LACANIA

There is said to be a stretch of beach here on which it would be possible to land.

10. "J" BEACH: Gulf of APPOLLACHIA

From the mouth of the River APPOLLACHIA to C. CARAVOLA there is a stretch of sandy beach which is described as a most suitable landing point.

11. "K" BEACH: CALAVARDA-CREMASTO

This is a flat beach: low-lying hinterland: swampy in parts: impossible in winter. Where it is not swampy and dissected by streams, there are often houses and walled enclosures inland of the beach.

It is strongly defended by guns and machine guns on high ground inland.

Behind the beach the ground extends for 1-1½ kilometres inland before reaching the hills. That part of the ground which is next to the RHODES-CASTELLO road is only slightly uneven and rough and chiefly composed of cultivated fields interspersed with marsh; eastward from the road it is surrounded by hills. Troops landed in this sector, to avoid the fire of enemy artillery installed on the hills, would be obliged to make a frontal attack. The formation of

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12. "L" BEACH: CREMASTO-TRIANDA

This is a flat beach, line of advance is over level cultivated land, becoming boggy towards road at base of mountains which then rise steeply, commanding all the lowland.

It is strongly fortified with trenches, wire; artillery and machine guns arranged for cross-fire.

The defensive position on the hills can only be approached directly from the front: there is no possibility of executing an outflanking movement.

The ground east of TRIANDA and west of CREMASTO is shut in by mountains in the form of a horseshoe, so that troops advancing on this ground would be exposed to artillery fire from the centre and the flanks. Nevertheless, a landing effected successfully at this point could be supported by landings made at other points on the shore, e.g., on the north-eastern part of the island.

(C46758)

M3

150 SCARPANTO (including SARIA and KASO)

SCARPANTO (KARPATHOS) INCLUDING SARIA AND KASO

(See Plans 89, 116 and Admiralty Chart 2824)

Reports marked * are of doubtful reliability.

(1) General Remarks

SCARPANTO

The Island is about 26 miles long and 5 and 2½ miles wide at its Southern and Northern ends respectively.

A ridge of high mountains extends the length of the Island, the highest point on which is M. CALOLINI, 4,000 ft.

The inhabitants, who are Greeks, number 8,000.

The Italian Governor lives at PEGADIA.

KASO

This Island, which is about 9 miles long and 3 miles wide, lies off the South Western point of SCARPANTO at a distance of 3 miles and is separated from that Island by KASO Strait. The Island is very mountainous, with a maximum height of 1,700 ft., but slopes towards the North and West. The shores are mostly high rocky cliffs with deep water close to.

The population, which is Greek, amounts to 2,500.

The Italian Governor lives at OPHRIS, in the centre of a bay on the North coast.

SARIA

SARIA, situated off the North point of SCARPANTO, from which it is separated by a channel 100 yards wide, is about 4½ miles long with an average width of about 1½ miles. It is 1,833 ft. high; the Eastern coast is steep to, with high cliffs, except at a point 1½ miles Southward of ALIMUNDA, the North-East point, where there is a small sandy bay.

(2) Port Facilities

PEGADIA

There is a landing place on the South side of PEGADIA Bay and, to the East of this in a sandy bight, there is a small boat harbour used by local vessels.

There is a small quay, 180 by 18 ft.

The anchorage is in the North of the bay off VRONTI in 15 fathoms of water, where there is good shelter from North-West winds, which prevail during summer, but it is open to the North-East and East.

* Some harbour works, including a breakwater, were reported in process of construction, but there was no sign of any work going on when an aerial reconnaissance was made in April, 1939, and no report of such work has been received since.

Harbour Craft

PEGADIA

Three motor vessels of 30 tons each: two of 2 tons

Three motor launches.

Six small barges of 5-6 tons capacity.

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Harbour Craft

PEGADIA

Three motor vessels of 30 tons each: two of 2 tons

Three motor launches.

Six small barges of 5-6 tons capacity.

Five or six rowing boats.

PHENIKI

Ten small fishing smacks.

TRISTOMA

On the West coast is TRISTOMA Harbour—a narrow inlet with an entrance 170 ft. wide. This is a small base with a landing place. The Harbour is closed from June to September, when the Maestrale blows.

Since the bombardment TRISTOMA has been used for landing war materials and provisions in preference to PEGADIA.

*ARCASSA and PHENIKI Bays

There is anchorage for small vessels in these two bays. At PHENIKI, on the Northern shore of the bay, there is a 60-ft. Quay near the Customs House. Here there is a small fishing village.

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KASO

Piers

OPHRIS Bay

East side of Entrance: A Pier, 5,375 sq. ft. in area.
In the Harbour: a Pier, length 75 ft., width 15 ft.

Harbour Craft

Two motor vessels of 30 tons each.
Two sailing vessels, 10 and 25 tons.

Two small motor launches.
Twenty (approximately) fishing caiques.

Other Anchorages

There are reasonably good anchorages in AMORPHOS, MAKRI YALO and CASTELLO Bays on the South Coast of SCARPANTO. In MAKRI YALO Bay vessels up to 500 tons can anchor 100 yards from the shore, and vessels over 500 tons 1,000 yards from the shore. The beach, 100 yards long, is suitable for boats up to 30 tons loaded.

In KASO there is anchorage in 4-5 fathoms, sand, off OPHRIS, about 300 yards from the entrance to the Harbour, and off AMONDA, on the East side of AGIOS GEORGIOS Point, about 300 yards from the shore. There is anchorage in 7-10 fathoms sand, 200 yards offshore, in KHELATROS Bay.

Barracks

- (a) PEGADIA, less than a mile West of the Village.
- (b) TRISTOMA, behind the ruined Church; these measure 164 ft. by 50 ft.
- (c) MENETE, on M. PROFETA ELIA, near the Coast Defence Batteries.
- (d) AFIARTIS, accommodating Air Force men and A.A. Gunners.
- (e) PHENIKI.
- (f) OTHOS.
- (g) APERI.
- (h) PANAGIA.
- (i) PORT SARIA.

Army Headquarters.—Army Headquarters are at TRIKOUCHE.

Fuel Storage

- (i) Behind the Church in PEGADIA, near to or in the building in which munitions are kept, there is a stock of petrol.
- (ii) Petrol in drums is stored at TRISTOMA Harbour.
- (iii) There is an Underground Petrol Depot tunnelled out of a hill on the North side of AFIARTIS Aerodrome; the position of the entrance has not been observed.

Provision Stores.—All provision stores are concentrated in PEGADIA, in various commandeered houses.

(7) Air Facilities

Aerodromes

- (i) PEGADIA. Lat. 35° 30' N., Long. 27° 13' E. Dimensions 875 by 440 yards. There are hangars and repair facilities, including workshops.
- (ii) AFIARTIS. Lat. 35° 25' N., Long. 27° 10' E. Dimensions—2,700 by 760 yards. Landing area 900 by 500 yards. There are no hangars; there is a large building of two floors for housing workmen and storing tools at the Eastern extremity; there is also a large wooden shed.

Boundaries: On the East the small bay at the South of MAKRI YALO, on the North-East and North-West between two rivulets running almost parallel with the East and S.W. coast; on the South at the foot of the hill which runs from North-East to South-West. On the North and South boundaries

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Boundaries: On the East the small bay at the South of MAKRI YALIO, on the North-East and North-West between two rivulets running almost parallel with the East and S.W. coast; on the South at the foot of the hill which runs from North-East to South-West. On the North and South boundaries there are wire entanglements.

Emergency Landing Grounds.—Small Emergency Landing Grounds have been laid out as follows:—

- (i) Cap NICOLA—6½ miles North of PEGADIA Bay.
- (ii) OLIMBO, on the West coast, in position Lat. 35° 44' N., Long. 27° 12' E.
- (iii) DIAFANI—Lat. 35° 45' N., Long. 27° 14' E.

Seaplane Base

There is no permanent seaplane base, but the following beaches are used from time to time as temporary anchorages provided with mooring buoys:—

- (i) *PEGADIA Bay: hangars and moorings reported. There was, however, no sign of any hangar on September 5th, 1940, during bombardment, and the Bay was reported to be a most unlikely place, from the point of view of exposure, for a permanent Seaplane station.
- (ii) *ARCASSA Bay.
- (iii) *TRISTOMA Harbour: sited about ½ mile from its Northern extremity.
- (iv) MAKRI YALIO Bay: a slip for seaplanes.

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(10) Transport Facilities

Sea

There is communication by steamer between SCARPANTO and other islands of the DODECANESE group.

Roads

The only carriage road in the Island leads from PEGADIA to AFIARTIS aerodrome through MOUNT PROFETA ELIA Fort in a Southerly direction and to ARCASSA through APERI, VOLATHA, ORTHOS, PILIES and PHENIKI in a Northerly, then South-Westerly and Southerly direction. The Section to AFIARTIS Aerodrome is 16 ft. wide. The mountain sections of this road are reported to be in poor condition.

(11) Signal Communications

W/T Stations

SCARPANTO

- (a) PEGADIA: this can communicate with RHODES.
- (b) MENETE: 1½ miles to the South.
- (c) M. ELIAS: for local use.
- (d) OLIMBO: for local use.
- (e) PHENIKI: for local use.
- (f) DIAPHANI: for local use.

KASO

- (a) KAVO AKTIS: for local use.
- (b) OPHRIS (Northern Coast) next to the Governor's house, in the centre of the Bay.
- (c) C. TRUSSALIA.
- (d) KHARDIES.

SARIA.—Near the Barracks and the A.A. Battery at PALATIA.

V/S Stations

- (a) M. PROFETA ELIA (SCARPANTO).
- (b) KAVO AKTIS (KASO).

Cables

There is a cable communication between SCARPANTO (where it comes in at GONIA di VRONTI, on the Northern Shore of PEGADIA Bay) and RHODES.

Telephone

There is telephonic communication between all villages and PEGADIA, and with KASO.

(12) Defences

(i) *Sea front defences*

(a) COAST DEFENCE BATTERIES.

Battery No.	Location and Description.	Armament.	Grading.		Date of Latest Report.
			Position of Guns.	Calibre.	
1	CASTELLO Peninsula—Sited on the high ground.	4—5.9-in.	A.2	B.2	1941
2	Punta NICOLALACHI—Sited to the west of the Point (medium calibre).	2—? calibre	C.0	—	1941
3	MAKRI YALO Bay—Sited West of PRASSONISI Islet.	3—5.9-in.	C.3	C.0	1940
4	MENITES—Sited on the north-east slopes of Mts. PROFETA ELIA.	3—5.9-in.	B.2	B.0	1941
5	PEGADIA Promontory—(E.D.) (P.D.)	6—3.9-in.	D.0	D.0	1940
6	PEGADIA Bay—Sited on the hill overlooking the bay. (Medium calibre).	5—? calibre	B.2	—	1941

- (b) MENEYE : 14 miles to the South.
 (c) M. ELIAS : for local use.
 (d) OLIMBO : for local use.
 (e) PHENIKI : for local use.
 (f) DIAPHANI : for local use.

KASO

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 (b) OPHRIS (Northern Coast) next to the Governor's house, in the centre of the Bay.
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6	PEGADIA Bay—Sited on the hill overlooking the bay. (Medium calibre).	5—? calibre	B.2	—	1941
7	Mte. ORCHILI—Sited near O.P. (Medium calibre.)	2—? calibre	B.2	—	1941
8	Mte. GROSSO	? No. and calibre.	C.3	—	1941
9	Mte. ALOUA—Sited on the cliff south of the mountain. (E.D.) (P.D.)	? No. and calibre.	D.0	—	1941
10	Mte. PROFETA ELIA—This battery covers the KASO-SCARPANTO Strait.	4—8-in.	—	C.0	1940
11	PILIES—Battery reported under construction in 1940. (E.D.) (P.D.)	? No. and calibre.	D.0	—	1940
12	ARKASSA—Sited in the hills, battery reported under construction in 1940. (E.D.) (P.D.)	? No. and calibre.	D.0	—	1940
13	Punta S. TEODORO. (Medium calibre)	1—? calibre	C.3	—	1941
14	KASO Island—Punta KAVO AKTIS—Sited on the north-east point of the Island	? No. and calibre.	D.0	—	1940
15	C. KAVO KHELATROS. (E.D.) (P.D.)	? No. and calibre.	D.0	—	1941
16	Punta AVLAKI—Emplacements for heavy guns reported in 1940.	? No. and calibre.	D.0	—	1940
17	Mte. S. GIORGIO—Sited on the west slopes. (E.D.) (P.D.)	? No. and calibre.	D.0	—	1941

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Observation Posts :—

- (i) M. PROFETA ELIA.
- (ii) PEGADIA.
- (iii) C. CASTELLOS.
- (iv) AGHIOS TEODORO.
- (v) M. ORCHILI, on the highest point. The Post is connected by telephone with TRISTOMA, to which there is a rough road.
- (vi) PALEO CASTRO Point.

KASO :—

- (i) AGIOS GEORGIOS Pt.
- * (ii) KHATIES.
- (iii) TRUSSALIA.
- (iv) C. KAVO AKTIS.

(e) *Wire Entanglements.*—SCARPANTO.

There are wire entanglements from VRONTI to PEGADIA and at MAKRI YALO (Southern).

KASO.—*There are wire entanglements—

- (a) Around ARVANI TOKHORI, from PROIPEGADIA to THERMONIA.
- (b) At PROSS PEGADIA, near the windmill.
- (c) From YERO-YANNI to CATTARI.

(g) *Magazines, etc.*—(a) PEGADIA : the Main Ammunition Depot. Forty tons of ammunition recently landed on SCARPANTO are stored behind the Church.

(b) AFIARTIS Aerodrome : Bomb and Munition store tunnelled out of the hill on the North side.

(c) TRISTOMA : Ammunition and Petrol Stores.

(d) M. PROFETA ELIA : inside the fortified area on the Summit.

(e) VOLODOS (KASO).—The Munition Store at PEGADIA also contains 10–12 mountain guns, 10–15 machine guns, 3 heavy guns of 6-in. or 4.9-in. calibre, 4 A.A. guns, 3 water carts, 50 barrels of petrol, 30 cases of shells, and 15 cases of hand grenades, and possibly mines.

(ii) *Movable Armament*

Mobile Batteries

See DODECANESE—GENERAL.

Local Defence Positions

On KASO.—These consist of heavy machine guns in the following positions :—

VRISEES.

CATARTI.

STENO-AVLAGL

- (iii) IRUSSALIA
(iv) C. KAVO AKTIS.

(e) *Wire Entanglements.*—SCARPANTO.

There are wire entanglements from VRONTI to PEGADIA and at MAKRI YALO (Southern).

KASO.—*There are wire entanglements—

- (a) Around ARVANI TOKHORI, from PROIPEGADIA to THERMONIA.
- (b) At PROSS PEGADIA, near the windmill.
- (c) From YERO-YANNI to CATTARI.

(g) *Magazines, etc.*—(a) PEGADIA: the Main Ammunition Depôt. Forty tons of ammunition recently landed on SCARPANTO are stored behind the Church.

(b) AFIARTIS Aerodrome: Bomb and Munition store tunnelled out of the hill on the North side.

(c) TRISTOMA: Ammunition and Petrol Stores.

(d) M. PROFETA ELIA: inside the fortified area on the Summit.

(e) VOLODOS (KASO).—The Munition Store at PEGADIA also contains 10–12 mountain guns, 10–15 machine guns, 3 heavy guns of 6-in. or 4·9-in. calibre, 4 A.A. guns, 3 water carts, 50 barrels of petrol, 30 cases of shells, and 15 cases of hand grenades, and possibly mines.

(ii) *Movable Armament
Mobile Batteries*

See DODECANESE—GENERAL.

Local Defence Positions

On KASO.—These consist of heavy machine guns in the following positions:—

VRISEES.
CATARTI.
STENO-AVLAGI.
AGHIOS GEORGIOS.
AGHIOS IOANNIS.

(iii) *Searchlights*

Searchlights are mounted on M. PROFETA ELIA and on the high ground of C. AGHIOS THEODOROS.

There are Section Posts of carabinieri at PHENIKI, M. PROFETA ELIA, OLIMBO, DIAFANI Ruins, and APERI (SCARPANTO): they are armed with machine guns.

(iv) *Local Seaward Defences*

Mines.—It is reported that SCARPANTO has been mined.

Boom.—There is a boom at PEGADIA.

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(v) Local Air Defences
A.A. Batteries

A.A. Battery No.	Location and Description.	Armament.	Grading.	Date of Latest Report.
A.A. 1	Punta CASTELLO (heavy)	? No. and calibre	A.2	1941
A.A. 2	Baia di CASTELLO	3—? calibre	B.2	1941
A.A. 3	West of AERODROME: 3 heavy	? No. and calibre	A.2	1941
A.A. 4	A.A. batteries and intense light			
A.A. 5	A.A. fire.			
A.A. 6	East of AERODROME: 3 heavy			
A.A. 7	A.A. batteries and intense light			
A.A. 8	A.A. fire.			
A.A. 9	North of AERODROME	? No. and calibre	A.2	1941
A.A. 10	MAKRI YALO Bay	3—? calibre	B.2	1941
A.A. 11	1 mile south-west of MENITES	3—? calibre	B.2	1941
A.A. 12	1 mile north-west of MENITES	3—? calibre	B.2	1941
A.A. 13	1 mile north-east of MENITES	3—? calibre	B.0	1941
A.A. 14	PEGADIA Bay	3—? calibre	B.0	1940
A.A. 15	KERA PANAGIA	3—? calibre	C.3	1940
A.A. 16	TRISTOMA—Sited near the barracks	A.A. M.G.s	C.3	1941
A.A. 17	SARIA Island: PALATIA Bay	? No. and calibre	B.2	1941
A.A. 18	Monte PROFETA ELIA	3—? calibre	B.2	1940
A.A. 19	North of AKROTIRI (heavy) A.A. guns.	2—? calibre	A.2	1941
A.A. 20	Punta S. TEODORO	3—? calibre	B.2	1940
A.A. 21	KASO Island: OPHRIS—Sited near the W/T Station.	3—? calibre	C.3	1940

Mobile A.A. Guns

Four field guns on special A.A. mountings on Monte PROFETA ELIA (not stated which Monte PROFETA ELIA) and graded C.O. 1940.

(viii) Garrison

There are about 3,500 troops on SCARPANTO, including SARIA and KASO.

(13) Reconnaissance

General Remarks

Generally speaking there are no beaches on SCARPANTO Island, north of Lat. 35° 34' N., which are suitable for landing troops.

The coast is rugged, with steep cliffs, and affords very little shelter from the prevailing winds. Moreover, the formation of the Island is hilly and rocky, and the almost complete absence of roads or even paths would make the landing of troops inadvisable except in the south.

The Beach Report which follows, except where otherwise stated, is graded A.1 and dated March, 1941.

It should be read in conjunction with Admiralty Chart 2824, Plans 89 and 116, and paragraph (12) DEFENCES.

Until distribution of Plan 116 and revised Plan 89 is effected, reference should be made to B.M.21.F. issued by M.M.N.I.C., 12/4/41.

Note.—Plan 89, dated June, 1941, has an error of latitude and longitude and has not got the beaches marked on it.

A.A.10	1/4 mile south-west of MENITES	3—? calibre	B.2	1941
A.A.11	1/4 mile north-west of MENITES	3—? calibre	B.2	1941
A.A.12	1/4 mile north-east of MENITES	3—? calibre	B.0	1941
A.A.13	PEGADIA Bay	3—? calibre	B.0	1940
A.A.14	KERA PANAGIA	3—? calibre	C.3	1940
A.A.15	TRISTOMA—Sited near the barracks	A.A. M.G.s	C.3	1941
A.A.16	SARIA Island: PALATIA Bay	? No. and calibre	B.2	1941
A.A.17	Monte PROFETA ELIA	3—? calibre	B.2	1940
A.A.18	North of AKROTIRI (heavy)	2—? calibre	A.2	1941
A.A.19	guns.			
A.A.20	Punta S. TEODORO	3—? calibre	B.2	1940
A.A.21	KASO Island: OPHRIS—Sited near the W/T Station.	3—? calibre	C.3	1940

Mobile A.A. Guns

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Note.—Plan 89, dated June, 1941, has an error of latitude and longitude and has not got the beaches marked on it.

Beach Report—East Coast

1. BEACH "A." (Lat. 35° 33' 28" N., Long. 27° 13' 45" E.) in AKHATA Bay (or Baia di ACATA).

Recognition

Recognition is easy from N.E. PROFETA ELIA cliff (Lat. 35° 32' 50" N., Long. 27° 13' 45" E.) is a good mark.

The bay has to be entered before the beach is apparent, owing to outlying, but above-water, rocks.

Landing

The beach is of sand and shingle—debris from the ravine. There is no shelter from N.E., but otherwise it is a good landing place. At least four A.L.C. or six cutters could beach together.

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Defences

None seen. Most unlikely.

Exits

Hard but quite feasible scramble up a somewhat wooded ravine towards the road. There are no habitations in the neighbourhood.

2. BEACH "B" (Lat. 35° 31' 13" N., Long. 27° 13' 30" E.), in PEGADIA Bay.

Recognition

Recognition is obvious and very easy.

Beach Landing

There is perfect sand over whole length of BEACH "B": probably steep-to. (*Also see* SCALA piers below.)

Defences

There was no wiring on the beach or bank or at SCALA. No other defences seen near PEGADIA, or on PEGADIA Promontory. Guns, 3-in., or under, might be concealed but it is unlikely, as the whole was inspected closely. No pill-boxes were visible. No sentries were seen or any military activity or M.I.

Note.—Subsequent reports state that the beach is wired. *See also* reports of C.D. Batteries in paragraph (12) DEFENCES.

Exits

A grassy bank, 2-5 ft. high, backs the beach. Carriers could probably get off anywhere. Guns on wheels might require tackles and planks, though they could probably get off on their own at the north end, where the bank is lowest. They might also get off near the middle at one section.

There are small meadows behind this and the whole is overlooked by a tree covered range of hillocks.

Landings at PEGADIA appear to be difficult once the beach is left as rocks come straight down to the sea. There is a small cambered wharf on which a boat of about 10 tons appeared to be hauled up.

The wharf could probably be used by ships' boats and M.L.C.

There is a small white croft at about the middle of the beach. It has a kind of frame structure near it but no wires could be seen. This might be the Telephone Exchange, or perhaps a Transformer or Junction Station.

3. BEACH "C": (Lat. 35° 29' 00" N., Long. 27° 14' 20" E.) in AMORPHOS Bay immediately West of Cape VOLOKHAS (or VOLOCA). There is one possible place in the vicinity.

Recognition

Recognition is difficult but by making land S.W. of C. VALOCA and running along to the north say 2° off the low cliff, "C" BEACH will appear as the only possible landing place and is at the corner of the coast before it sweeps to the westward. The beach is at the mouth of the first long shallow ravine met with, beyond some rocks slightly protruding above water.

Landing

This is a steep-to beach formed by shingle debris from the ravine. There is more far at

Defences

There was no wiring on the beach or bank or at SCALA. No other defences seen near PEGADIA, or on PEGADIA Promontory. Guns, 3-in., or under, might be concealed but it is unlikely, as the whole was inspected closely. No pill-boxes were visible. No sentries were seen or any military activity or M.T.

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Recognition

Recognition is difficult but by making land S.W. of C. VALOCA and running along to the north say 2° off the low cliff, "C" BEACH will appear as the only possible landing place and is at the corner of the coast before it sweeps to the westward. The beach is at the mouth of the first long shallow ravine met with, beyond some rocks slightly protruding above water.

Landing

This is a steep-to beach formed by shingle debris from the ravine. There is room for at least two A.L.C. abreast. Ships head N.N.E. Four cutters or six whalers could probably beach together.

Defences

*There is probably none. No wire, habitations or men were seen. The beach is obviously overlooked from Monte PROFETA ELIA.

*But see also Plan 89 and paragraph (12) DEFENCES.

Exits

The ravine banks are comparatively easy: they are 8 ft. high, slope 1:2: with N.W. exit beyond, over gently sloping rocky ground up to a low cliffy ridge about 500 yards inland over which a way can easily be found. There seems to be a path to the N.W.

It will be possible to land 3-7-in. howitzers from M.L.C. or A.L.C. and bring them into action nearby, probably under good cover.

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4. BEACHES: "D.1": Lat. 35° 28' 40" N., Long. 27° 13' 15" E.
 "D.2": Lat. 35° 28' 33" N., Long. 27° 13' 10" E.
 "D.3": Lat. 35° 28' 25" N., Long. 27° 13' 10" E.

All in AMORPHOS Bay (or AMORFO).

Recognition

Recognition is not easy. Get into Baia di AMORFO, then approach with either:—

- (i) The abrupt Northern slope-away of Monte KHOMALIS (COMALI) bearing N. 60° W. Magnetic, which should lead into the coast N.E. of "D.1" — "D.2" Bay.
- (ii) Monte TRULLS, pointed summit, bearing N. 40° W. Magnetic.

Marks.—To the N.E., the coast consists of very low cliff with a considerably higher section 300 yards long ending 200 yards to the N.E. of "D.1" cove.

Thence work West until "D.1" — "D.2" Bay is reached.

To the S.W. the point is low, long and rocky. To the S.W. of the point in the cove is "D.3" BEACH backed by low cliff.

To the S.W. of this again are a multiplicity of false coves, so it is much better to ensure making the coast to the N.E. and working S.W. till the correct bay is met. The correct coves cannot then be mistaken.

Landing

"D.2" and "D.1" BEACHES appear to be formed by the shingle-debris of wooded ravines running into them.

"D.2" could beach five A.L.C. together.

"D.1" could take two.

"D.3" could beach six. It consists of a strip of sand at the base of a low cliff.

All sections appear steep-to.

Defences

There are no heavy wire defences.

On "D.1" BEACH there is a small white fisherman's hut near the shore at the S.W. end. There is also a small white-washed "pill-box affair" near it; no camouflage. On this beach there is a line of ragged posts 5-10 yards inland which might carry a few strands of wire, but certainly nothing elaborate. A man was seen by the hut.

About 200 yards up "D.1" ravine there is a white "croft" which is a good mark in daylight.

It is possible that the wire is merely fencing, and old at that. No wire or defences were seen in "D.2" or "D.3". A machine-gun on "D.1" might cover "D.2" approach. Wire might be concealed in undergrowth off the beach in "D.2".

It is considered on balance that there may be a small post at "D.2" cove, covering the area.

By plotting from contours, "D" BEACHES can be seen to be almost certainly overlooked from Monte PROFETA ELIA. There are no signs of any battery or place for crews to live in AMORPHOS Bay.

Exits

BEACHES "D.1" and "D.2".

Once the banks of the ravines have been surmounted the exits in all directions are as good as any Greek Island. The ground is rocky with occasional scrub and terraces. It would be heavy work to move 3-7-in. howitzers but not impossible, particularly with holdfasts and tackles. Carriers might also find a way up. The ravine sides are seldom more than gradient 1:2 but are very broken. The ravines have a lot of vegetation in them.

There is a number of crofts and a path.

To the S.W. of this again are a multiplicity of false coves, so it is much better to ensure making the coast to the N.E. and working S.W. till the correct bay is met. The correct coves cannot then be mistaken.

Landing

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There is a number of crofts and a path.

BEACH "D.3"

The cliff backing this beach is broken down, at least, at two places and considerably at the N.E. or right-hand end. A smallish party—say 30 or so agile troops—could easily get off it via these gaps. It would form a valuable auxiliary landing place.

Suggestion

Land a preliminary party from one A.L.C. or S.L.C. at "D.3" BEACH to take defences, if any, in the rear.

Remark

BEACH "D.2" is the only all-weather beach in the island. It might be used as a sheltered haven by craft, if weather worsens during operations.

There is a possible but third rate shingle and rock landing and exit in the cove between SCOPI and CASTEGLION.

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5. BEACH "S": Baia di FOCHIA on the Western side of Punta SCOPI.
(Lat. 35° 28' 00" N., Long. 27° 12' 35" E.)

Recognition

Recognition is fairly easy. It is situated at the inner end of the South side of low Punta SCOPI, with a cliffy bluff above it.

Landing

Landing is good on sand and shingle: it takes about five A.L.C. together.

Defences

Defences are most unlikely. There is no wire on the beach, nor is there any visible above it.

Exit

A low cliff surrounds the cove but it is broken at places, especially at its ends, where guns and carriers can leave the beach.

Inland there is rough rocky ground leading up to a road, via a ravine North of the above bluff, or across the open: no houses near.

With plenty of hands and tackles 3-7-in. howitzers could probably be taken up the road. Carriers might also find a way.

6. BEACH "Q" in Baia di AMAOPI

(Lat. 35° 27' 45" N., Long. 27° 11' 52" E.)

Recognition

Recognition is easy. The cove is in a quarry like a scooped out cliff, behind Isola di MIRA (on Chart PRASONISI).

Landing

Five A.L.C. could beach together on sand and shingle beach.

Defences

Most unlikely. There is no wire. (See also paragraph (12) DEFENCES and Plan 89.)

Exits

Exit consists of a very steep scramble up a broken part of a 30-ft. high cliff and is possible for men only.

7. BEACH "P" in Baia di AMAOPI. (Lat. 35° 27' 15" N., Long. 27° 11' 25" E.)

Recognition

Recognition is easy. It is located just N. of prominent Punta VUNI and S.W. of Isola di MIRA (on Chart PRASONISI).

Landing

The beach is good steep-to sand. It would take at least eight A.L.C. beached together.

Defences

There is no wire on beach and probably none at all: no other defences visible.

Exit

The beach is backed by a cliffy grassy bank 20 ft. high at the N.E. end and sloping down to 5 ft. at the S.W. end: gradient probably not more than 1 in 14.

Carriers could probably negotiate it at the S.W. end and guns (3-7-in.) could be got up with planks and tackles.

With plenty of hands and tackles 3-7-in. howitzers could probably be taken up the road. Carriers might also find a way.

6. BEACH "Q" in Baia di AMAOPI

(Lat. 35° 27' 45" N., Long. 27° 11' 52" E.)

Recognition

Recognition is easy. The cove is in a quarry like a scooped out cliff, behind Isola di MIRA (on Chart PRASONISI).

Landing

Five A.L.C. could beach together on sand and shingle beach.

Defences

Most unlikely. There is no wire. (See also paragraph (12) DEFENCES and Plan 89.)

Exits

Exit consists of a very steep scramble up a broken part of a 30-ft. high cliff and is possible for men only.

7. BEACH "P" in Baia di AMAOPI. (Lat. 35° 27' 15" N., Long. 27° 11' 25" E.)

Recognition

Recognition is easy. It is located just N. of prominent Punta VUNI and S.W. of Isola di MIRA (on Chart PRASONISI).

Landing

The beach is good steep-to sand. It would take at least eight A.L.C. beached together.

Defences

There is no wire on beach and probably none at all; no other defences visible.

Exit

The beach is backed by a cliffy grassy bank 20 ft. high at the N.E. end and sloping down to 5 ft. at the S.W. end; gradient probably not more than 1 in 1 1/2.

Carriers could probably negotiate it at the S.W. end and guns (3-7-in.) could be got up with planks and tackles.

Inland there are low grass terraces and a path to a road; it is better going than "D" or "Q" BEACHES but there is some rocky ground.

8. BEACHES: "E.1": Lat. 35° 26' 22" N., Long. 27° 10' 45" E.
"E.2": Lat. 35° 25' 54" N., Long. 27° 10' 45" E.

Both in MAKRI YALO Bay.

Recognition

Recognition is easy. It is the first clear beach to the South of PRASONISI Islet South of prominent Punta VUNO.

To the South "E.2" is separated by a low rocky point from "E.1".

Landing

Both the beaches are perfect sand and probably reasonably steep-to. Almost any number of landing craft can be taken in, but it is unsheltered in North and East winds.

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Defences

There is no wiring on the beaches and no elaborate wiring inshore: no wire or posts at all were visible and no suspicious objects for pill-boxes.

There are no guns of any size on PRASONISI Island and no defences at all were visible there. *See also* paragraph (12) DEFENCES and Plan 89.

Exits

Exits are good everywhere for infantry.

Bren carriers could get inland anywhere from "E.2" and at several places, especially at the South end of "E.1." There are two obstacles as below:—

(i) Along "E.1" and to a much less extent along "E.2" there is a grassy bank dividing the land from the beach. The maximum height is 3 ft., sloping mostly. This is the first obstacle to guns. It should be negotiable with use of tackles and/or planks.

(ii) Behind "E.1" BEACH there are some small broken-down low-terraced meadows and then low cliffs; but these are broken down and offer no obstacle to infantry; and carriers could find a way through, especially at the South end.

With plenty of hands and tackles, and possibly without, guns could also be got through these "cliffs," especially at the South end where there are some crotts.

Behind "E.2" BEACH there are practically no cliffs. H.A. guns could be landed from here from M.L.C. and taken inland comparatively easily.

Suggestion

"E.2" BEACH should be captured by landing on "E.1": guns to be landed then at "E.2". H.A. guns can be landed.

S.L.C. with a section with grenades to take PRASONISI first to see whether defended by M.G.s. A landing could probably be made on one side or other on this low rocky Islet.

Note.—The chart calls the larger Island to the North, PRASONISI. On Plan 89 this is Isola di MIRA.

The Chart has no name for what the Plan calls PRASONISI.

9. BEACHES: "F": Lat. 35° 25' 30" N., Long. 27° 10' 30" E. (Baia di MACRIJALO).
"G": Lat. 35° 25' 12" N., Long. 27° 09' 50" E. (Baia di MIDI).

Neither of these beaches could be approached closely but the impression is that "G" is possible in odd places but that exits are somewhat cliffy. And that "F" is as good as "E.2."

No wire could be seen along the beaches or in the vicinity of area "W," which is indicated on Plan 116. There are certainly no elaborate wire entanglements. (*See also* Plan 89.) There may be look-outs in this area.

WEST COAST

1. BEACH "H": Lat. 35° 27' 35" N., Long. 27° 07' 30" E.

Recognition

Recognition is easy: it is the only long beach midway between PALEOCASTRO and Capo ST. THEODORO, both outstanding.

Landing

This is an excellent landing beach: steep-to and sand throughout; almost unlimited room.

Defences

There appeared to be a line and, in parts, two lines of posts on the beach, particularly at the ends. These probably carry wire but nothing elaborate.

(b) Below "E.1" Beach there are some small, broken-down, low-lying buildings and then low cliffs; but these are broken down and offer no obstacle to infantry; and carriers could find a way through, especially at the South end.

With plenty of hands and tackles, and possibly without, guns could also be got through these "cliffs," especially at the South end where there are some clefts.

Behind "E.2" BEACH there are practically no cliffs. H.A. guns could be landed from here from M.L.C. and taken inland comparatively easily.

Suggestion

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WEST COAST

1. BEACH "H": Lat. $35^{\circ} 27' 35''$ N., Long. $27^{\circ} 07' 30''$ E.

Recognition

Recognition is easy: it is the only long beach midway between PALEOCASTRO and Capo ST. THEODORO, both outstanding.

Landing

This is an excellent landing beach: steep-to and sand throughout; almost unlimited room.

Defences

There appeared to be a line and, in parts, two lines of posts on the beach, particularly at the ends. These probably carry wire but nothing elaborate.

No defence posts could be seen.

This was the only beach besides "D.1" where any wire was seen. Can probably be covered by reported (not seen) battery at Capo THEODORO. *See* Plan 89 and paragraph (12) "DEFENCES".

Exits

Exit is easy everywhere: bushes fringe the beach: carriers could get off almost anywhere. The land inshore is flatter than elsewhere and not so rocky.

This is an obvious place to land a large force to attack the aerodrome. Perhaps this is why it is wired.

C.D. Battery

A battery is reported at C. THEODORO. This is not seen and is unlikely to be anything large.

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2. BEACH "J." Lat. $35^{\circ} 28' 20''$ N., Long. $27^{\circ} 08' 18''$ E. in Baia di SAN NICOLA.

Recognition

Recognition is easy. PALEOCASTRO stands out well and high and is cliffy and steep. The coast should be approached to the South, and boats bear North on sighting PALEOCASTRO.

Landing

Landing is good on steep-to sand: there is room for six A.L.C. beached together.

Defences

There is no wire on the beach: none is visible at all and there is certainly nothing elaborate. It is easy to defend by M.G.s on PALEOCASTRO.

Exits

Exit is easy for infantry. The beach is backed by cultivated terraces, walled to the North-West, earthed to South-East. There seems to be a lane between the two sections up which guns could go. In any case they could be taken up to the road over the South-Eastern terrace with the aid of tackles.

They can probably get off and into ARCASSA along the cliff path to the North-West but this end of the beach could not be seen.

It is probably not as easy for guns, etc., as BEACH "K."

Roads

Paths run up from ARCASSA. The Northern branch is certainly too narrow for carriers. The Southern branch is better and might be a lane.

A road can be seen: cuttings, apparently of recently turned earth, zig-zag towards Monte CHELAF di MENETE. It could not be followed down into ARCASSA from the latter point. Possibly it is incomplete and will follow dotted path inland of S. NICOLA.

The road could probably be reached from the beach by guns, etc. (see under "Exits" above.)

The beach on the opposite side of PALEOCASTRO is also good, but exits, over low cliff much worse. Men might get off at various places, especially at the North end in ARCASSA where carriers and guns could also get off with a struggle. There is a steep bank.

The beach could probably be covered by a C.D. Battery at C. THEODORO, depending on where guns are: none seen and no large ones are likely.

3. BEACH "K." Lat. $35^{\circ} 30' 00''$ N., Long. $27^{\circ} 20''$ E. (Between Punta FINICHI and Punta SAN GIORGIO.)

Recognition

Recognition is not easy. To the North there is a line of low dark cliffs comparatively unbroken but with some rather unsatisfactory coves with sand beaches. To the South this line of cliff stretches out to Punta FINICHI (PHINEKI), which is also low. At the South side and inland of this point are two castle shaped hillocks which are conspicuous and might be visible at night.

Punta FINICHI can also be recognised by its proximity to PALEOCASTRO which stands out high and steep.

Recommended Approach

Approach Punta FINICHI with the Northern rocky shoulder of Monte COMALI

Exit is easy for infantry. The beach is backed by cultivated terraces, walled to the North-West, earthed to South-East. There seems to be a lane between the two sections up which guns could go. In any case they could be taken up to the road over the South-Eastern terrace with the aid of tackles.

They can probably get off and into ARCASSA along the cliff path to the North-West but this end of the beach could not be seen.

It is probably not as easy for guns, etc., as BEACH "K."

Roads

Paths run up from ARCASSA. The Northern branch is certainly too narrow for carriers. The Southern branch is better and might be a lane.

A road can be seen: cuttings, apparently of recently turned earth, zig-zag towards Monte CHELAF di MENETE. It could not be followed down into ARCASSA from the latter point. Possibly it is incomplete and will follow dotted path inland of S. NICOLA.

The road could probably be reached from the beach by guns, etc. (see under "Exits" above).

The beach on the opposite side of PALEOCASTRO is also good, but exits, over low cliff much worse. Men might get off at various places, especially at the North end in ARCASSA where carriers and guns could also get off with a struggle. There is a steep bank.

The beach could probably be covered by a C.D. Battery at C. THEODORO, depending on where guns are: none seen and no large ones are likely.

3. BEACH "K": Lat. $35^{\circ} 30' 00''$ N., Long. $27^{\circ} 20'$ E. (Between Punta FINICHI and Punta SAN GIORGIO.)

Recognition

Recognition is not easy. To the North there is a line of low dark cliffs comparatively unbroken but with some rather unsatisfactory coves with sand beaches. To the South this line of cliff stretches out to Punta FINICHI (PHINEKI), which is also low. At the South side and inland of this point are two castle shaped hillocks which are conspicuous and might be visible at night.

Punta FINICHI can also be recognised by its proximity to PALEOCASTRO which stands out high and steep.

Recommended Approach

Approach Punta FINICHI with the Northern rocky shoulder of Monte COMALI (KOMALIS) bearing N. 65° E. Magnetic. When near the coast bear slightly North, passing Punta FINICHI.

From here, BEACH "K" will be the first beach of any size and is enclosed on the North by another point also fairly low—20 ft. high.

There is a very prominent white cottage and a few little stone crofts at the North end of the beach.

Landing

Landing is good: steep to shingle and sand: it would take ten A.L.C. together.

Defences

There is no wire on the beach and none could be seen inland. There is certainly nothing elaborate.

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Exits

At the North and South ends of the beach there are sloping banks of sandy earth 30 ft. high which could be negotiated by carriers and probably guns. In any case the latter could be hove up by tackles, etc. In the centre there is a cliff, negotiable by infantry. The road runs just inland but owing to a stony wall it would be better if it were joined a little further North or South after clearing the beach.

Note.—The Chart in this vicinity is inaccurate.

It is doubtful whether FINICHI would be as good except in North-Westerly weather: beach not inspected: no M.G.s seen.

4. BEACH "L": Lat. 35° 31' 30" N., Long. 27° 08' 00" E.

Recognition

Recognition is not easy. AKROTIRI (Punta di PRONTI) is a low, red cliffy point $\frac{1}{2}$ mile to the North and not easy to recognise. Between this and the beach are a succession of broken cliffs and sandy coves with off-lying rocks. Men might land in these and scramble off but no guns or carriers could get ashore. To the South of BEACH "L" is a long, more or less unbroken low dark line of cliffs. There are a few unsatisfactory coves along this.

At the South end of BEACH "L" is a boat-shaped small rocky Islet about 10 ft. high shown on the Chart.

Approach Recommended

Keep the North shoulder of Monte TRULLS bearing N. 75° E., Magnetic, and on seeing low cliffs bear North slightly until boat-shaped rock is met with. This should ensure finding the beach. Monte TRULLS North shoulder bears nearly due E., Magnetic from this rock.

Landing

Landing is good: a steep-to, long beach with sand and shingle: a dozen A.L.C. can easily be beached together.

Defences

There is no wire on the beach: none seen inland and certainly nothing elaborate exists: no sentries visible.

Exits

The beach is backed at its ends by a grassy sandy bank but this disappears near the centre and guns and carriers should easily reach the road over a stony ravine bottom.

There are a few crofts by the road.

5. BEACH "M": Lat. 35° 33' 15" N., Long. 27° 07' 45" E. (Baia di ADIA).

Recognition

Recognition is fairly easy. Approach Monte MELLURA, just West of VOLATHA Village, bearing S. 82° E. Magnetic in transit with the point at foot of a steep bluff (Punta LIMENARI). This point can be approached close as it is deserted and more or less unapproachable from shoreward.

Thence bear slightly South for the beach which would be hard to see at night.

Landing

The beach is very steep-to sand. It is considered possible to hand up guns: there is room for half a dozen landing craft. It is rocky at the North end.

Exits

cliffs and sandy coves with off-lying rocks. Men might land on these and scramble on but no guns or carriers could get ashore. To the South of BEACH "L" is a long, more or less unbroken low dark line of cliffs. There are a few unsatisfactory coves along this.

At the South end of BEACH "L" is a boat-shaped small rocky Islet about 10 ft. high shown on the Chart.

Approach Recommended

Keep the North shoulder of Monte TRULLS bearing N. 75° E., Magnetic, and on seeing low cliffs bear North slightly until boat-shaped rock is met with. This should ensure finding the beach. Monte TRULLS North shoulder bears nearly due E., Magnetic from this rock.

Landing

Landing is good: a steep-to, long beach with sand and shingle: a dozen A.L.C. can easily be beached together.

Defences

There is no wire on the beach: none seen inland and certainly nothing elaborate exists: no sentries visible.

Exits

The beach is backed at its ends by a grassy sandy bank but this disappears near the centre and guns and carriers should easily reach the road over a stony ravine bottom.

There are a few crofts by the road.

5. BEACH "M": Lat. 35° 33' 15" N., Long. 27° 07' 45" E. (Baia di ADIA).

Recognition

Recognition is fairly easy. Approach Monte MELLURA, just West of VOLATHA Village, bearing S. 82° E. Magnetic in transit with the point at foot of a steep bluff (Punta LIMENARI). This point can be approached close as it is deserted and more or less unapproachable from shoreward.

Thence bear slightly South for the beach which would be hard to see at night.

Landing

The beach is very steep-to sand. It is considered possible to hand up guns: there is room for half a dozen landing craft. It is rocky at the North end.

Exits

Exit is by a path visible at the South end: it is suitable for infantry only. Guns and carriers could not move off this beach. Hillsides are very steep. There are crofts $\frac{1}{2}$ mile to the South.

Defences

Almost certainly nil.

The following reports are graded B.O.: the beaches mentioned are supplementary to those described above.

EAST COAST

BEACH "(a)" DIAPHANI Bay: landing is only possible from small boats. There is a steep path up the cliffs.

BEACH "(b)" KERA PANAGHIA Bay: no particulars.

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BEACH "(c)" AGHIOS THEODOROS: there is a sandy beach North of the Cape where a landing could be made from boats in fine weather: but no roads lead inward.

BEACH "(d)" PHINEKI Bight: just inside the Northern part of the bay there is a small mole on the West side. A 50/60-ton caique can go alongside 108 yards from a small road which leads to the main road of the Island. The depth of water close to this mole is reported to be about 2½ fathoms.

BEACH "(e)" GLARES Bay: no particulars.

BEACH "(f)" FISES Bay: here landing is only possible in fine weather: there is a steep path to the village of OLIMBO.

BEACH "(g)" Saint IRENE Bay: There is a sandy beach with good anchorage in Northerly winds.

BEACH "(h)" TRISTOMA Bay: there is a mole where caiques can go alongside in fine weather.

BEACH "(i)" SARIA Bay: landing is impossible both on the North shore of SCARPANTO and on the South shore of SARIA.

KASO ISLAND

BEACH "(j)" Capo KAVO AKTIS. There is excellent landing according to the wind, on either Northern or Southern beaches. (But see Plan 89 and paragraph (12)—DEFENCES.)

BEACH "(k)" OPHRIS: landing is extremely difficult in a North wind.

BEACH "(l)" AGIOS IOANNIS Point (or Punta ZANNI): there is a small landing place in a gully in a bay just south of the point. Thence a path, very steep and rough, leads to the villages of POLI, ARVANITOKHORI, and OPHRIS, but it could only be used in very dry weather.

There are no good landing places on the South-East coast.

ARMATHIA ISLAND

BEACH "(m)". There is a landing place on the South East corner of the Island under the lee of the Southernmost point. Some houses are situated 160 yards from the beach. Water is available.

SIMI (and small adjacent islands)

(Lat. 36° 36' N., Long. 27° 51' E. (SIMI Town))

(See Plans 94 and 103)

(1) General Remarks

This group, which consists of the Islands of SIMI, SESKLI and NIMO, and various minor islets, including CONDRO, PLATI, OSSIA, DIAVANTE, MARMARA and COLUNDRO, is situated in the Gulf of DORIS near the Turkish Coast. SIMI is 15 miles West of the North point of RHODES.

SIMI is a mass of hard limestone, deeply dissected and submerged, overlaid with patches of softer marls and ragstone. The coast is irregular and deeply indented: on the North side the DIAPORI Channel, a hundred yards wide and deep enough for small craft (12-15 ft.), separates NIMO Island from the promontory of M. DIAPORI. The highest points are

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Formerly forested, the surface is now almost wholly scrubland and rocky pasture, with a few pines and cypresses in deep glens. But there are gardens and olive-yards on alluvial soil and terraced marl, at the head of PEDI Bay and at DRAKOUNDA, S. SOTIRI and S. MICHAEL PANORMITI.

(2) Port Facilities

There are various small harbours:—

SIMI Harbour can accommodate vessels up to 300 tons alongside the Quay.

PEDI HARBOUR: Except when the wind is in the North-East there is a sheltered anchorage with good holding ground. The harbour can only accommodate small vessels.

PANORMITI is sheltered in all winds and is suitable for small vessels but holding ground is not good.

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(3) The Town

The population, which is Greek and numbers about 6,000, lives almost wholly in the town of SIMI which occupies the steep sides of the port in the narrow YALO inlet of SIMI Bay, opening North-East towards the mainland. This harbour quarter is comparatively modern: the older village is around the mediaeval castle, 500 ft. high on the narrow ridge between YALO and the land-locked PEDI Bay South of it, which opens East. Other suburbs spread North to EMPORIO anchorage and along the shore of PEDI Bay.

The only other settlement is around the monastery of S. MICHAEL PANORMITIS, in a landlocked cove opening North-West on to LIPODIA Bay. This is frequented chiefly in summer by people from the town.

There are also homesteads and gardens in MARATONDA Bay, opening East in the Southern promontory of the island.

(4) Government Establishments

(a) Barracks and Encampments

(i) KAMBOS: Between the South-West side of KAMBOS and the fields which extend towards PEDI Harbour—Military Camps.

(ii) DRAKOUNTES: On the plateau between the Baia di EMPORIO and SIMI Harbour—Military Camps.

(iii) Baia di S. BASILIO on the West of the Island—Barracks.

(b) Fuel Storage

SIMI Harbour, on the port hand when entering the harbour—a Benzine store, three tons capacity and large stocks in barrels and tins.

(c) Munition Depôts

There is a Munition Dépôt at MOLO.

(7) Air Facilities

Seaplane Stations

(a) Baia di EMPORIO.

(b) SIMI Bay.

These stations can both be used in all weathers but there are no installations.

(9) Power Plants

There is an Electric Power Station at SIMI Harbour sited in a white house immediately above the Church, reported variously as 120 volt D.C. and 220 volt A.C. Possibly there are two Stations.

(10) Transport Facilities

Roads

The only road runs round SIMI Bay. There is a mule track from SIMI Town to PANORMITI Monastery and to other parts of the Island.

(11) Signal Communications

(i) W/T Stations

(a) In Porto di PANORMITI. Sited to the South of the Harbour.

(b) SIMI Harbour. Sited in the tower of the Church of the Annunciation on the Western shore of Port SIMI.

(i) KAMBOS: Between the South-West side of KAMBOS and the fields which extend towards PEDI Harbour—Military Camps.

(ii) DRAKOUNTES: On the plateau between the Baia di EMPORIO and SIMI Harbour—Military Camps.

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(ii) V/S Stations

(a) PLATI Island.

(b) SESKLI Island.

(c) AGHIOS JOANNISTIS SCHISTIS, on a height overlooking SESKLI Strait—Heliograph communicating with RHODES and other Islands.

(d) PANORMITI: Heliograph Station.

(iii) Cable

There is a cable communication with RHODES and PISCOPI Islands. The cable lands in PANORMITI Harbour.

(iv) Telephone

There is communication by telephone between SIMI and the various gun positions, etc., on the island.

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(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries:—

1940. P.D. No. 1 *Battery*: SIMI Town. Sited on the high ground in a position 330 ft. above the Town, (?) overlooking the harbour approaches—(?) guns of (?) calibre.
1940. P.D. No. 2 *Battery*: Punta dello SCOGLIO—(?) guns of 3-in. calibre.
1940. P.D. No. 3 *Battery*: PEDI Harbour (1). Sited on the Northern side of the entrance to the Bay—(?) guns of 3-in. calibre.
1940. P.D. No. 4 *Battery*: PEDI Harbour (2). Sited on the Southern side of the entrance to the Bay, (?) at or near C. FILONICO—(?) guns of 3-in. calibre.
1940. P.D. No. 5 *Battery*: Baia di S. GIORGIO DISALONA (2). Sited at or near C. SPATIE on the Northern side of the entrance—(?) guns of 3-in. calibre.
1940. P.D. No. 6 *Battery*: Baia di S. GIORGIO DISALONA (1). Sited at the Western extremity of the Bay, covering the approaches—(?) guns of 3-in. calibre.
1940. P.D. No. 7 *Battery*: Baia di S. GIORGIO DISALONA (3). Sited on the Southern side of the entrance—(?) guns of 3-in. calibre.
1941. No. 8 *Battery*: PANORMITI: 1 gun of (?) calibre.

Command Posts.—P.D. The Naval Command Post or Guard House, which comes under the LERO Naval Command, is at AGHIOS JOANNISTIS SCHISTIS, on the heights overlooking SESKLI Strait.

There are Military Command Posts or Guard Houses:—

- P.D. (i). On the heights above Baia di TOLI—4 men.
- P.D. (ii). At the Monastery TAXIARCHO MICHAEL, a little South of Baia di TOLI—4 men.
- P.D. (iii). At MOLO—10 men.
- P.D. (iv). At the Monastery of PANORMITI, near PANORMITI Harbour—15 men, and at various positions on the North-East coast of the Island.

(c) Local Defences.—The beaches may be wired.

There are entanglements round the encampments near PEDI Harbour and along the South West side of PEDI Town from MOLO through the fields to the Cemetery of AGHIA MARINA.

There are entanglements round the Military Camps at KAMBOS.

Observation Posts.—SIMI Town, on the high ground South of the Town, VASSALI Point, to the East of the Point.

(g) Magazines

- (i) Evangelistria Cemetery: Ammunition Store.
- (ii) Potamos or KATTARAKTIS: Ammunition Store.
- There are 30 tons of Ammunition on the Island.

(ii) Movable Armament

See DODECANESE—GENERAL

(iii) Searchlights

There is a searchlight on SESKLI Island.

Western extremity of the Bay, covering the approaches—(?) guns of 3-in. calibre.
 1940. P.D. No. 7 Battery: Baia di S. GIORGIO DISALONA (3). Sited on the Southern side of the entrance—(?) guns of 3-in. calibre.
 1941. No. 8 Battery: PANORMITI: 1 gun of (?) calibre.

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(e) *Local Defences.*—The beaches may be wired.

There are entanglements round the encampments near PEDI Harbour and along the South West side of PEDI Town from MOLO through the fields to the Cemetery of AGHIA MARINA.

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Observation Posts.—SIMI Town, on the high ground South of the Town. VASSALI Point, to the East of the Point.

(g) *Magazines*

- (i) Evangelistria Cemetery: Ammunition Store.
 - (ii) Potamos or KATTARAKTIS: Ammunition Store.
- There are 30 tons of Ammunition on the Island.

(ii) *Movable Armament*

See DODECANESE—GENERAL

(iii) *Searchlights*

There is a searchlight on SESKLI Island.

(iv) *Local Seaward Defences*

Minefields.—P.D. There are minefields off the South and East Coast of SIMI.

(vi) *Local Air Defences*

(a) *Anti-Aircraft Batteries*

- 1940. P.D. No. 1 A.A. Battery: MOLO, sited near some Lime Kilns—two A.A. guns of (?) 3-in. calibre.
- 1940. P.D. No. 2 A.A. Battery: Fortress of ST. MICHAEL—(?) A.A. guns of (?) 3-in. calibre.
- 1940. P.D. No. 3 A.A. Battery: PEDI, sited between the houses in the centre of the Harbour—two A.A. guns of (?) 3-in. calibre.
- 1940. P.D. No. 4 A.A. Battery: M. CROCE—two A.A. guns of (?) 3-in. calibre.
- 1941. No. 5 A.A. Battery: M. TRULIO: Sited on the hill near the Church of AGHIOS JOANNIS, concealed in pine trees and surrounded by barbed wire.

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(viii) *Garrison*

There are about 1,000 troops on the Island.

(13) Reconnaissance

Troops from RHODES have practised disembarkation in VASSALI Bay using flat iron barges which were towed to the beach.

Almost all the coast is cliff or steep rocky slopes, with wave-worn foot and deep water inshore. NIMO Island has a small cove opening West, and a few yards of shingle, and a landing place at the Church of S. MARIA NIMO on the South side.

East Coast

EMPORIO Bay has a beach, obstructed by houses and gardens, with a mule-track to the town by S. IRENE along the South side of the bay.

SIMI Port is steep-sided and closely surrounded by houses; at the West end of the port there is beach and an open space (TARSANA) used for boat-building. The small cove CARANI North of the port has a patch of shingle, but is obstructed by houses.

PEDI Bay facing East-North-East has a narrow entrance between precipitous slopes, on the North-West side. There is a steep road up to the town on the ridge; houses begin at about 150 ft., half a mile from the beach. The small beach at S. NICOLA chapel on the South side of the entrance is accessible only by water.

S. GEORGIO DISALONA is a deep break in the cliffs, wholly precipitous to 600-700 ft. with two narrow rocky gullies.

NANO Bay is a deep cove with an open beach; steep slopes Southward with cliffs to the North. A track up a rocky ravine leads to the inland cultivated plains of S. MARINA and KINOLIMIU (LAGO-SECCO) on the ridgeway from the town to PANORMITI.

MARATONDA Bay is a narrow inlet with precipitous sides and a short beach with a church, a few homesteads and enclosures. There is a track to the main ridgeway.

BAIA-FONDA and FANEROMENI Bay are steep-sided coves; FANEROMENI has access to the ridgeway.

SESKLI Island is steep-to, except the cove opening South-East behind PLATI Island. Behind the beach is an enclosed alluvial plain with a wall along the beach.

West Coast

LIFODIA Bay has steep slopes and low cliff. On its South-East side the land-locked port of PANORMITI has a long beach, but from the monastery Westward it is obstructed by walled plantations. The entrance is about 100 yards wide, and steep-to on both sides.

CUTRULLI Cove, North-West of LIPODIA Bay, has steep sides, no beach, and no access.

S. BASILIO Bay and CEFALA Cove are steep-to, except a short beach by S. BASILIO Church.

the town by S. IRENE along the South side of the bay.

SIMI Port is steep-sided and closely surrounded by houses; at the West end of the port there is beach and an open space (TARSANA) used for boat-building. The small cove CARANI North of the port has a patch of shingle, but is obstructed by houses.

PEDI Bay facing East-North-East has a narrow entrance between precipitous slopes. Round the head of the bay is alluvial ground with houses along the beach, and plantations on the North-West side. There is a steep road up to the town on the ridge; houses begin at about 150 ft., half a mile from the beach. The small beach at S. NICOLA chapel on the South side of the entrance is accessible only by water.

S. GEORGIO DISALONA is a deep break in the cliffs, wholly precipitous to 600-700 ft. with two narrow rocky gullies.

NANO Bay is a deep cove with an open beach; steep slopes Southward with cliffs to the North. A track up a rocky ravine leads to the inland cultivated plains of S. MARINA and KINOLIMIU (LAGO-SECCO) on the ridge from the town to PANORMITI.

MARATONDA Bay is a narrow inlet with precipitous sides and a short beach with a church, a few homesteads and enclosures. There is a track to the main ridge.

BAIA-FONDA and FANEROMENI Bay are steep-sided coves; FANEROMENI has access to the ridge.

SESKLI Island is steep-to, except the cove opening South-East behind PLATI Island. Behind the beach is an enclosed alluvial plain with a wall along the beach.

West Coast

LIFODIA Bay has steep slopes and low cliff. On its South-East side the land-locked port of PANORMITI has a long beach, but from the monastery Westward it is obstructed by walled plantations. The entrance is about 100 yards wide, and steep-to on both sides.

CUTRULLI Cove, North-West of LIPODIA Bay, has steep sides, no beach, and no access.

S. BASILIO Bay and CEFALA Cove are steep-to, except a short beach by S. BASILIO Church, and another in a small cove South of M. CASTRO on the North side of the bay. There is a track from the church to SIMI town.

S. REMO Bay, West of S. BASILIO Bay, is all precipitous.

LADI bay is all steep-to, but there is beach on the North side of the neck connecting M. CEFALA with the S. PHILEMONA Church and homesteads, whence there is a track to SIMI town.

S. DEMETRIO Bay and TURCO Bay are steep-to, but it is possible to land by the homestead in TOLI Bay; track thence by S. DEMETRIO upland plain to SIMI Town.

S. ISIDORO Bay is steep-to, but there is open shore in SARPE Cove

STAMPALIA 165

STAMPALIA

(Lat. 36° 34' N., Long. 26° 24' E.)

(See Plans 69 and 104)

Reports marked * are of doubtful reliability.

(1) General Remarks

(a) STAMPALIA Island may now be classed third to RHODES and LEROS as a Defended Base. To the Italians it is of considerable importance in connection with the strategy of the AEGEAN and of the Eastern Basin of the Mediterranean.

(b) The Island is most irregular in shape and consists of two large rocky masses joined by an isthmus about half a cable across. The highest point rises to 1,660 ft.

The population is about 2,000. The island produces wheat, barley, raisins and vegetables in sufficient quantities to be self-supporting. The rearing of cattle has been considerably extended.

(c) The Italians have strengthened the Defences and improved the facilities at STAMPALIA. The Harbour at MALTESANA, which is exclusively used as a Naval Base for surface ships, submarines and seaplanes, is well defended against attack by cruisers and light craft.

(2) Port Facilities

(a) PORT MALTESANA is 1½ miles long by nearly ½ a mile wide. The main entrance is to the Southward, through the Passage di PORTO, between the Islands CONDRONISI and GLINONISI. The Western entrance is between Point DIAPORI and GLINONISI, the Eastern entrance between PUNTA della FONTE and CONDRONISI; the latter is usually avoided because of BARACA reef in its approaches and the rocks South of Cape VODI.

Extensive Harbour works have been in progress for some time, and a Dockyard is under construction, but very little progress has so far been made.

There are two 15-ton sheers and several lighters.

Ships anchor inside MALTESANA Harbour at a distance of 125 yards from PUNTA FRANCO, the Eastern point of SCHINONDA inlet, in the sector included between the bearings 010°-320° of the obelisk situated on the point. The buoy moored 230 yards bearing 145° from the obelisk indicates the 9½ ft. depth line. In good weather, ships may anchor outside MALTESANA Harbour, between GLINONISI and MAKRIA PUNTA (sand and mud) in a depth of 100 to 130 ft.

(b) Port SCALA: this is the only free port for commerce, but the maximum time a vessel is allowed to remain is 24 hours.

Jetties

There is a small jetty at S. APOSTOLI.

Harbour Craft

- 2 Motor Vessels.
- 3 Sailing Vessels.
- 10 Fishing Smacks.

Anchorage

Ships anchor in a depth of some 32 ft. at a distance of 325 yards from the shore. The holding is bad during North and North-West winds, when strong gusts come down from the near summits. Vessels up to 30 tons can approach close inshore.

(c) Port VATI. This anchorage is formed by a deep cut into the West side of the Northern part of the island. Its length is about 1 mile and its width 2 cables, with a uniform depth of

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Anchorage

Ships anchor in a depth of some 32 ft. at a distance of 325 yards from the shore. The holding is bad during North and North-West winds, when strong gusts come down from the near summits. Vessels up to 30 tons can approach close inshore.

(c) Port VATTI. This anchorage is formed by a deep cut into the West side of the Northern part of the island. Its length is about 1 mile and its width 2 cables, with a uniform depth of about 30 ft. on sand and mud. The leading channel (CANALE DI BOCCA) is cut by a sandy ridge which prevents entrance to ships with a draught of more than 11 ft.

*Dredging operations have been carried out in the CANALE DI BOCCA since January, 1940, so that the bay can be used by destroyers and submarines.

(d) Port PANORMO. This anchorage is formed by a deep bay on the North side of the Western part of the Island. It is open to the North with depths of 260 ft. in the entrance decreasing to 52 ft. in its Southern part.

* Destroyers and submarines take shelter there when on patrol.

(e) The arrangement of the Defences and information received suggest the Italians are making use of LIVADIA Bay and PERA GALON, at the head of BAIÀ DI VAI, the latter as a commercial Port.

(f) A small boat canal cuts through the Isthmus at STRETTO.

(g) There are various other bays and inlets in the Island which could be used as anchorages or are suitable as bases for small craft. (See "Sailing Directions.")

(C46758)

x3

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(3) The Town

The principal Town is LIVADIA, which is situated in the North-West corner of LIVADIA Bay. It is of archaeological interest but has no commercial, political or strategic importance.

The Military Governor's house is at PEREILLO (Port SCALA). The same restrictive regulations regarding the circulation and establishment of the civilian population are in force in STAMPALIA as in LERO. To go about the Island a special permit has to be obtained from the Naval Authorities, and entrance to any area containing defence works is forbidden.

Water Supply

The water supply is adequate.

(4) Government Establishments

(a) Barracks

- (i) LIVADIA Bay. On the shore of the seaplane anchorage.
- (ii) MONTE PERVOLE. For the crews of Coast Defence and A.A. Batteries.
- (iii) MONTE ATTIMADARI.
- (iv) AGRELLIDI Bay.
- (v) MONTE CASTELLANA.

(b) Fuel

Benzine, Kerosine and fuel oil are stored at Port MALTESANA near the Naval Base. There are Oil Tanks with a total capacity of 1,500 tons on the Island.

(7) Air Facilities

(a) Seaplane Bases

There are twelve mooring buoys for the use of seaplanes in MALTESANA Harbour and a Seaplane Alighting Area at the Naval Base. The number of aircraft, probably Naval flying boats, which use STAMPALIA as a Base is not known.

SAN BASILIO inlet, in the North of LIVADIA Bay, is also used, but only occasionally, as a Base for Seaplanes.

(b) Aerodromes and Landing Grounds

*There is an Airport at MALTESANA, North of the Naval Base, on the plain beyond the Barracks.

*There is an Emergency Landing Ground near LIVADIA, in the plain North of the Town.

(10) Transport Facilities

(a) Sea

STAMPALIA (PORT SCALA) is the terminus of the RHODES Line, which before the war was plying twice a month between all important Islands. In addition there are some motor schooners trading with KOS, KALIMNO and LERO.

(b) Roads

The road which connects Port MALTESANA with PORT SCALA and LIVADIA on the coast is in fairly good condition. It deteriorates as it passes from LIVADIA, through very hilly country Northward to FORT MONTE PERVOLE, and Southward to FORT MONTE ATTIMADARI.

A road connects Port MALTESANA with PERA GIALON and thence to the Fort on MONTE CASTELLANA.

- (iii) MONTE ATTIMADARI.
- (iv) AGRELLIDI Bay.
- (v) MONTE CASTELLANA.

(b) *Fuel*

Benzine, Kerosine and fuel oil are stored at Port MALTESANA near the Naval Base. There are Oil Tanks with a total capacity of 1,500 tons on the Island.

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The road which connects Port MALTESANA with PORT SCALA and LIVADIA on the coast is in fairly good condition. It deteriorates as it passes from LIVADIA, through very hilly country Northward to FORT MONTE PERVOLE, and Southward to FORT MONTE ATTIMADARI.

A road connects Port MALTESANA with PERA GIALON and thence to the Fort on MONTE CASTELLANA.

A road is under construction connecting Port MALTESANA with the Coast Defence Batteries on CAPE PULARI. This road is little more than a mule track at present.

(11) **Signal Communications**

W/T Stations

(a) PORT SCALA. This station, situated in Lat. 36° 32' 50" N., Long. 26° 22' 16" E., is also the telephonic centre of the whole Island, and communicates with all Observation Stations and fortifications.

(b) West of L'ASCENSIONE.

(c) PERA GIALON.

(d) MONTE ATTIMADARI.

(e) MONTE PERVOLE.

(f) MONTE CASTELLANA.

Telephones

The telephone exchange is at PALEOCASTRO. All Batteries are connected to the telephone system.

V/S Station

A Heliograph Station is on the roof of a Monastery.

(12) Defences*(i) Sea Front Defences**(a) Coast Defence Batteries*

No. 1 Battery: MONTE PERVOLE, mounted inside a concrete fort camouflaged from the air—4 guns of 3.9-in. calibre.

*No. 2 Battery: PALEOCASTRO; possibly mobile—2 guns of 2.7-in. calibre.

No. 3 Battery: SAN CRISOSTOMO, on the Southern slope of M. PROFETA ELIA, mounted on a platform—2 guns of (?) 6-in. calibre.

No. 4 Battery: MONTE VARDIA—(?) guns of (?) calibre.

No. 5 Battery: MONTE CUTELLA. Position Lat. $36^{\circ} 31' 20''$ N., Long. $26^{\circ} 19' 20''$ E.—(?) guns of 6-in. calibre.

No. 6 Battery: MONTE ATTIMADARI. Lat. $36^{\circ} 30' 50''$ N., Long. $26^{\circ} 20' 20''$ E.—a heavily armed fort; a large (?) number of guns of 3.9-in. calibre.

No. 7 Battery: MONTE NERO—2 guns of under 6-in. calibre; possibly 3.9-in.

No. 8 Battery: PUNTA SALLIDA—(?) guns of (?) calibre.

No. 9 Battery: LIVADIA. Lat. $36^{\circ} 31' 48''$ N., Long. $26^{\circ} 20' 30''$ E.—(?) guns of 6-in. calibre.

No. 10 Battery: CASTELLO, on the Southern point of PORTO SCALA—2 guns of 3.9-in. calibre.

No. 11 Battery: CASTELLO, on the Northern point of PORTO SCALA—2 guns of 3.9-in. calibre.

*No. 12 Battery: MONTE VIGLA—2 guns of under 6-in. calibre, possibly 3.9-in.

*No. 13 Battery: ST. ANDREA Bay, (?) position—(?) guns of (?) calibre.

No. 14 Battery: BATARIA NOVANTA UNA. Lat. $36^{\circ} 34' 30''$ N., Long. $26^{\circ} 22' 40''$ E.—10 guns of 6-in. calibre.

No. 15 Battery: SANTORINOU Hill, sited 035° PUNTA DIAPORI, 650 yards—(?) guns of (?) calibre.

No. 16 Battery: PUNTA DIAPORI, (?) position—2 guns of 5.9-in. calibre.

No. 17 Battery: SAN APOSTOLI—4 guns of 3.9-in. calibre.

No. 18 Battery: GLINONISI, (?) position—(?) guns of (?) calibre.

No. 19 Battery: CONDRONISI, sited on the summit of the hill in the centre of the island—2 guns of 5.9-in. calibre.

No. 20 Battery: PUNTA della FONTE—2 guns of 5.9-in. calibre.

*No. 21 Battery: ISOLA SAN DOMENICA—2 guns of (?) calibre.

No. 23 Battery: CIMA del TURCO. Lat. $36^{\circ} 34' 30''$ N., Long. $26^{\circ} 34' 55''$ E.—6 guns of 3.9-in. calibre.

No. 23 Battery: AGRELLIDI Bay: a permanently stationed mobile battery on the

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 - No. 18 Battery : GLINONISI, (?) position—(?) guns of (?) calibre.
 - No. 19 Battery : CONDRONISI, sited on the summit of the hill in the centre of the island—2 guns of 5.9-in. calibre.
 - No. 20 Battery : PUNTA della FONTE—2 guns of 5.9-in. calibre.
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 - No. 23 Battery : CIMA del TURCO. Lat. $36^{\circ} 34' 30''$ N., Long. $26^{\circ} 34' 55''$ E.—6 guns of 3.9-in. calibre.
 - No. 23 Battery : AGRELLIDI Bay ; a permanently stationed mobile battery on the South-West shores of the bay—(?) medium guns of (?) calibre.
 - *No. 24 Battery : ISOLA CUZZOMITI—2 guns of (?) calibre.
 - No. 25 Battery : C. PULARI (i), on the extreme point of the cliff—2 medium size guns of (?) calibre.
 - No. 26 Battery : C. PULARI (ii), on the hill above the cape—3 medium size guns of (?) calibre.
 - No. 27 Battery : MONTE CASTELLANA, mounted inside a strongly built concrete fort which controls a wide arc of approach from about N.N.W. through E. to S.S.W.—4 guns of (?) 3.9-in. calibre.
 - No. 28 Battery : PORT VATI, on the heights to the Eastward commanding the anchorage and its approaches—(?) guns of (?) calibre.
 - No. 29 Battery : M. St. TOMASSO—2 guns of 3.9-in. calibre.

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Observation Posts

Observation Posts, each unit comprising a large underground shelter, telescope, range-finder, telephone, W/T installation (in liaison with PERA GIALON) and a garrison of 25-30 marines, are established at—

- (i) MONTE ATTIMADARI.
- (ii) CIMA del TURCO.
- (iii) MONTE PROFETA ELIA
- (iv) MONTE PERVOLE.
- (v) MONTE CASTELLANA.
- (vi) CAPE PULARI.
- (vii) PALEOCASTRO.

(c) Local Defences

Trenches, Wire and Machine Gun Posts.—Barbed wire entanglements, trenches and machine gun posts have been located as follows:—

- (i) STRETTO: this entanglement divides the Island at the narrowest point.
- (ii) PORTO MALTESANA: between P. DIAPORI and the Naval Base and continued along the Northern shore of PORTO MALTESANA.
- (iii) MAKRIA PUNTA: just south of BALA della STRETTO, the wire extends to about 600 yards on either side of the PUNTO; it protects ammunition stores and an Observation Post.
- (iv) Between PUNTA FOCIONISIA, CAPO di VAI and the Southern end of BAIA di VAI along the coast.
- (v) BAIA di SAN ANDREA.
- (vi) MONTE ATTIMADARI and MONTE CASTELLANA, around the forts.
- (vii) PORT SCALA, around the fortified zone.

(g) Magazines

Magazines, Munition Stores and Dumps have been located as follows:—

- (i) Port MALTESANA: at the Naval Base and in underground galleries dug into SANTORINI Hill.
- (ii) CALATHOS Plage: West of Punta della FUNTE.
- (iii) BATARIA NOVANTA UNA: in an underground gallery. West of L'ASCENSIONE.
- (iv) SAN APOSTOLI.
- (v) MONTE CASTELLANA: on the Western slopes.
- (vi) PERA GIALON.
- (vii) MAKRIA PUNTA: behind barbed wire defences.
- *(viii) PORT SCALA.
- *(ix) MONTE PERVOLE.
- *(x) MONTE ATTIMADARI.
- *(xi) AGRILIO: a poison gas store.

(ii) Movable Armament

See DODECANESE—GENERAL.

(iii) Searchlights

*There is a Searchlight in MALTESANA Harbour, location not known.

(iv) Local Seaward Defences

Minefields.—A minefield, 2½ miles from the shore, extends from OXO PETRO to KAVO KHILUS; these are widely separated contact mines set at a depth of 10 ft.

Booms and Nets

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Minefields.—A minefield, 2½ miles from the shore, extends from OXO PETRO to KAVO KHILUS ; these are widely separated contact mines set at a depth of 10 ft.

Booms and Nets

A/S Booms are in position at the three entrances to MALTESANA Harbour.

(v) *Local Air Defences*

- No. 1 A.A. Battery : MONTE PERVOLE—(?) A.A. guns of (?) 3-in. calibre.
- No. 2 A.A. Battery : MONTE PROFETA ELIA—(?) A.A. guns of (?) 3-in. calibre.
- No. 3 A.A. Battery : MONTE ATTIMADARI—(?) A.A. guns of (?) 3-in. calibre.
- No. 4 A.A. Battery : PORTO SCALA—probably Pom-Poms.
- No. 5 A.A. Battery : SANTORINI Hill—(?) A.A. guns (several) of (?) 3-in. calibre.
- No. 6 A.A. Battery : PUNTA DIAPORI, near the coast Defence Battery—(?) A.A. guns of (?) 3-in. calibre.
- No. 7 A.A. Battery : SAN APOSTOLI—3 A.A. guns of (?) 3-in. calibre.
- No. 8 A.A. Battery : CONDRONISI—(?) A.A. guns of (?) 3-in. calibre.
- No. 9 A.A. Battery : SAN DOMENICA Island—(?) A.A. guns of (?) 3-in. calibre.
- No. 10 A.A. Battery : MONTE CASTELLANA—(?) A.A. guns of (?) 3-in. calibre.

STAMPALIA 169

(viii) *Garrison*

The total number of troops is about 1,000.

(13) **Reconnaissance**

AGRELLIDI BAY. This is considered to be the most suitable landing place, since the shore is not believed to be fortified with wire or trenches. The landing is easy from boats and the important military and naval centres of PORT MALTESANA and PERA GIALON are only $2\frac{1}{2}$ and $1\frac{1}{4}$ miles distant, respectively, from the beach and are connected by a good path. The Eastern coast defences of PORT MALTESANA must be taken into consideration.

MARMARI BAY : Its shore is not fortified, but landing is possible only in fine weather and the troops would have to force their way through the defences of STRETTO to reach PORT MALTESANA.

LIVADIA BAY. The landing is possible in fine weather but would have to be carried out under the fire of coast defence batteries 9 and 10, and the troops would have to encounter the wire and trench defences of PORTO SCALA.

Good landing places exist in PANORMO Bay and PORTO Bay but these places are rather far away from all important strategic points in the Island. The latter is very shallow and is commanded on both sides by high ground ; the entrance is only a few yards wide, in $1\frac{1}{4}$ fathoms.

BAIA di VAL, which is long and narrow, is excellent for landing. It has a sandy beach with some rocks at the head, and high ground on all sides. It is impossible in North-West winds.

All the Southerly points of Stampalia are useless when Southerly winds are blowing.

In the absence of definite information, all beaches must be considered to be defended.

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MAINLAND OF ITALY

GENERAL

(12) Defences

Little is known of the extent to which coastal areas between the main Ports of ITALY are defended. The following, with general information in Section V (5) Defended Areas, are the only particulars available of batteries, which, with armoured trains and Maritime coast watching organisation, constitute the intermediate defences of the Mainland.

LIGURIAN Seaboard (Excluding the area VOLTURI to RECCO, which is included in Defences of the Port of GENOA. See Plan 13).

(a) General

Grading.
Date of
Report.

The defences of the LIGURIAN Seaboard are reported to be increased by road blocks, blockhouses, machine guns, and A.A. guns and machine guns—the heaviest concentration being in the area ALBISSOLA—GENOA	C.3	1942
Coast Defence works are reported between RAPALLO and PORTO FINO		
Batteries are manned by Naval Personnel, and coastal schooners are placed some miles out to keep listening watch	B.3	1940
Six long-range Coast Defence Batteries are reported between FINALE and SPOTORNO; they may be Land Defences South-East of SPEZIA, between Marina di CARRARA and Marina di MASSA there are a number of small calibre guns: these were reported as A.A. guns but it is possible that they are also intended to prevent landing on the beach which, at this point, is flat and sandy	C.3	1940
	B.2	1941
(b) Minor Ports and A.A. Defences		
BORDIGHERA: Two 4.7-in. guns mounted; barbed wire along the shore	C.3	1942
ARENZANA: Battery 1, SAN MARTINO Mt.: Guns No. & Posn. mounted by the Tunnel situated at the end of a new road leading from the level crossing where the railway from ARENZANA crosses the main road. Two 15-in. guns.	C.3	1942
Battery 2: TERRE ROUGE: Behind S. MARTINO three 8.3-in. guns	C.3	1942
Magazine.—Ammunition is stored in the SAN MARTINO Tunnel	C.3	1942
SCOGLIO NAVE: Six 3-in. A.A. guns	C.3	1942

(a) General

of the Port of GENOA. See Plan 13).

	Grading.	Date of Report.
The defences of the LIGURIAN Seaboard are reported to be increased by road blocks, blockhouses, machine guns, and A.A. guns and machine guns—the heaviest concentration being in the area ALBISSOLA—GENOA	C.3	1942
Coast Defence works are reported between RAPALLO and PORTO FINO		
Batteries are manned by Naval Personnel, and coastal schooners are placed some miles out to keep listening watch	B.3	1940
Six long-range Coast Defence Batteries are reported between FINALE and SPOTORNO: they may be Land Defences	C.3	1940
South-East of SPEZIA, between Marina di CARRARA and Marina di MASSA there are a number of small calibre guns: these were reported as A.A. guns but it is possible that they are also intended to prevent landing on the beach which, at this point, is flat and sandy	B.2	1941

(b) Minor Ports and A.A. Defences

BORDIGHERA: Two 4.7-in. guns mounted; barbed wire along the shore	C.3	1942
ARENZANA: Battery 1, SAN MARTINO Mt.; Guns No. & Posn. mounted by the Tunnel situated at the end of a new road leading from the level crossing where the railway from ARENZANA crosses the main road. Two 15-in. guns.	C.3	1942
Battery 2: TERRE ROUGE: Behind S. MARTINO three 8.3-in. guns	C.3	1942
Magazine.—Ammunition is stored in the SAN MARTINO Tunnel	C.3	1942
SCOGGIO NAVE: Six 3-in. A.A. guns	C.3	1942

(c) Armoured Trains.—(For details of the organisation which brings this system of mobile defence into immediate action see Section V (5) Defended Areas.)

	Grading.	Date of Report.
Armoured Trains, mounting two to six A.A. guns and 6-in. to 6.8-in. Coast Defence guns, have been seen on the Coastal Railway between the Franco-Italian Frontier and SPEZIA	B.2	1940
Steam Armoured Trains have been stationed at VESIMA, ALBISSOLA, and VADO	C.3	1942
An armoured train carrying five 6-in. guns has been seen at NERVI	A.2	August, 1942
Large guns on railway mountings are reported to patrol the Coast between SPEZIA and RIVA TRIGOSO	B.2	1940

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WEST COAST OF ITALY

Defence Works have been increased and additional troops allocated to Coastal Defence

B.2 1942

GENOA—LEGHORN

There is a belt of A.A. guns along the coast between these Ports

B.3 1940

OSTIA

At the mouth of the River TIBER there are (?) number of (?) 12-in. guns
Similar Batteries are reported at unspecified points on the West Coast.

Pos. C.3
Cal. C.4 1940

SOUTH AND SOUTH-WEST COASTS OF ITALY

The Coast of Southern Italy is fortified against raids, particularly Calabria, where machine-gun nests and strong points have been established all along the coast, at railway and road intersections and near principal bridges

B.2 1942

AMANTEA—CATANZARO ..

This stretch of coast is being fortified with guns of medium calibre and machine-gun nests. The latter are placed to control vital roads and principle junctions. Railways are guarded

C.3 1941

CROTONE

A.A. guns of 3-in. calibre have been mounted along the coast in the CROTONE Area

B.2 1940

EAST COAST OF ITALY

FIUME—ABBAZIO, and probably beyond.

3-in. field guns, lightly camouflaged, and machine guns along the coast

C.0 1942

BARLETTA—BRINDISI

Four-gun Batteries of 4-in. guns are mounted along the coast, number and positions not known

B.2 1940

Armoured Trains

Armoured trains mounting A.A. and Coast Defence Naval guns have been seen on the Adriatic Coast

B.2 1940

MAINLAND OF ITALY AND ADJACENT ISLANDS DEFENDED PORTS

ANCONA

(Lat. 43° 37' N., Long. 13° 30' E.)

(See Plans 2 and 2a, 1941 (in preparation), and 3)

(1) General Remarks

ANCONA is of some strategic importance: it is the only good harbour between VENICE and BARI: it is well adapted for embarking troops, and it is situated at the narrowest part of the ADRIATIC SEA, which, at this point, is only 70 miles across.

It is of little commercial importance: imports consist of coal, grain, jute, phosphates and cement, and exports are agricultural products, lime and asphalt.

(2) Port Facilities

The Harbour

The Harbour is formed by moles constructed Westward of the town. North-Westerly gales cause a considerable sea and prevent vessels working cargo.

Depth of Water

There is a depth of 26 to 27 ft. at the entrance and of 24 to 25 ft. alongside the quays where vessels discharge.

Moles and Quays

The MOLO CLEMENTINO, the root of which is called MOLO TRAIANO, extends 3 cables Westward from the Northern end of the town, thence for about 1½ cables West-North-Westward it continues as the MOLO NORD, after which a breakwater extends Westward for 1½ cables.

The MOLO JONA projects about a cable South-South-Westward from the Eastern end of MOLO CLEMENTINO.

The Eastern side of the harbour is bounded by the CALATA NAZARIO SAURO to the Northward and by the CALATA FRYATT to the Southward.

From the CALATA NAZARIO SAURO the PONTILE TRAPEZOIDALE extends West-South-Westward for about 350 ft. and, further South, the PONTILE Santa MARIA, on which is the Port Office and at the root of which is the Customs House, extends Westward for 450 ft.

The MOLO SUD extends North-Westward from Southern part of the Harbour and terminates in a Northerly direction. From a point three-quarters of a cable from its Northern extremity a breakwater extends North-Westward.

There are two spurs, one extending Southward from the MOLO NORD and the other Northward from the Northern extremity of MOLO SUD, and it is between these two spurs that the entrance to the harbour lies.

The Northern breakwater is designed to give additional protection from the "Bora," and the Southern to prevent silting-up in the harbour entrance.

Lifting Appliances

There are five travelling cranes, each of 1 ton lifting capacity, normally sited on the MOLO JONA and MOLO CLEMENTINO.

(2) Port Facilities

The Harbour

The Harbour is formed by moles constructed Westward of the town. North-Westerly gales cause a considerable sea and prevent vessels working cargo.

Depth of Water

There is a depth of 26 to 27 ft. at the entrance and of 24 to 25 ft. alongside the quays where vessels discharge.

Moles and Quays

The MOLO CLEMENTINO, the root of which is called MOLO TRAIANO, extends 3 cables Westward from the Northern end of the town, thence for about $1\frac{1}{2}$ cables West-North-Westward it continues as the MOLO NORD, after which a breakwater extends Westward for $1\frac{1}{2}$ cables.

The MOLO JONA projects about a cable South-South-Westward from the Eastern end of MOLO CLEMENTINO.

The Eastern side of the harbour is bounded by the CALATA NAZARIO SAURO to the Northward and by the CALATA FRYATT to the Southward.

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The Northern breakwater is designed to give additional protection from the "Bora," and the Southern to prevent silting-up in the harbour entrance.

Lifting Appliances

There are five travelling cranes, each of 1 ton lifting capacity, normally sited on the MOLO JONA and MOLO CLEMENTINO.

There are also some electric cranes—number and position not known—for discharging coal and phosphates.

There are two medium-sized floating derricks with a lift not exceeding 30 tons.

There are two cranes, each of an estimated lifting capacity of 10 tons, at the Cantieri Navali Riuniti Yard.

Harbour Craft

There are two medium-sized Tugs, numerous Steam Trawlers, Drifters, Lighters and several Water-tank vessels in the port.

Floating and Dry Docks

There are no Floating or Dry Docks.

Patent Slips

There are two Patent Slips sited at the root of the MOLO SUD.

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Water Supply for Ships

Good water is laid on to the wharves: 150 tons per day can be shipped: water can also be supplied in tank vessels.

Warehouses

Warehouses run the length of the CALATA NAZARIO SAURO: there is also a large warehouse for tobacco at the Southern end of the harbour.

Clearing Facilities

The railway extends right round the Harbour.

(3) The Town

ANCONA has a population of 70,000.

Water Supply

The water supply comes from the River ESINO and is purified by filtration.

Hospitals

- (i) Civil Hospital: a modern building containing 350 beds: it is well equipped.
- (ii) Military Hospital: 250 beds.

(4) Government Establishments

Observatory

There is a Meteorological Observatory, which is situated at Monte CAPPUCCINI Signal Station.

Barracks

VILLAREY Barracks is the principal Military Establishment: it appears, externally, to be considerably superior to the average Italian Barracks: accommodation for 3,000 men. GIALDINI Barracks also accommodates 3,000 men. The FASCIST Barracks accommodates 200 men.

Prison

The Citadel is used as a Military Prison.

State Railway Fuel Works

The Fuel Works of the State Railways are situated at FALCONARA, about 7 miles W. by N. from ANCONA.

(5) Commercial Establishments

Shipyard

The Cantieri Navale Riuniti has been modernised and has facilities for building Destroyers and for carrying out large repairs to hull and machinery.

There are three main building slips suitable for building vessels up to 6,000 tons and some smaller ones for building coasters and tugs.

About 1,800 men are employed.

(a) Fuel Storage

- (i) At the root of the MOLO SUD, South of the Airport, there are two small Oil Fuel tanks, each of estimated capacity of 500 tons.

Water Supply

The water supply comes from the River ESINO and is purified by filtration.

Hospitals

- (i) Civil Hospital : a modern building containing 350 beds : it is well equipped.
- (ii) Military Hospital : 250 beds.

(4) Government Establishments

Observatory

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There are three main building slips suitable for building vessels up to 6,000 tons and some smaller ones for building coasters and tugs. About 1,800 men are employed.

(a) Fuel Storage

- (i) At the root of the MOLO SUD, South of the Airport, there are two small Oil Fuel tanks, each of estimated capacity of 500 tons.
 - (ii) On the MOLO JONA there is one Oil Fuel Tank of unknown capacity.
 - (iii) At ANCONA Airport there is a supply of Petrol : quantity unknown.
 - (iv) At FALCONARA, 7 miles from ANCONA, there are two large Petrol Depots, one of which belongs to A.G.I.P. and the other to S.I.A.P. Petrol is not stored in bulk at these Depots.
 - (v) An Oil and Petrol Installation is reported to be projected for ANCONA, but there is no evidence that the work has been put in hand.
- The project is reported to include eight main tanks protected by a camouflaged roof with further tanks underground of total capacity 13,000 tons, Pumping Station, Oiling Pier, etc.

The proposed site is not known.

(b) Coal

Small stocks of coal are available for shipping.

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(6) Aircraft Factories

Nil.

(7) Air Facilities

Seaplane Station

ANCONA Airport is established on the inner side of the Harbour between the Petroleum Wharf and the Patent Slips. There is one Hangar and a Slipway. The Station is provided with W/T, and a supply of petrol, quantity unknown, is available.

Landing Ground

FALCONARA Landing Ground: Position 43° 38' N., 13° 23' E. A well-appointed Landing Ground is situated at FALCONARA. At both the North-West and North-East corners of the area there is a steelwork Hangar about 150 by 50 ft. It is sited between the River ESINO and the angle formed by the junction of the Coastal Railway line and the line to FOLIGNO.

(8) War Material Factories

There are some small chemical works or agencies.

(9) Power Plants

There is an Electric Power Station on the West side of the VIALE dei NAZIONALE, near the Gasometer. It is a fairly large and modern installation and supplies most of the surrounding country. (P.D.)

(10) Transport Facilities

Rail

The Railway from ANCONA runs Northward to RAVENNA along the coast, with a junction at FALCONARA where the line branches inland to FOLIGNO. The main line along the coast is practically along the water front for several miles and is intersected at various points by bridges, the first being at the River ESINO. The Railway from ANCONA is continued to the South by a single-track line. This runs to FOGGIA and BARI, etc. An extension of the line is made to the Maritime Station and Harbour. There are extensive locomotive sheds and wagon parks at ANCONA Station.

Roads

The Main Road is the Coast Road to the Northward to RAVENNA which forks at RIMINI inland to BOLOGNA. This Road is in fair condition most of the way. The Road to the South runs to PESCARA-FOGGIA, etc., along the coast. The inland roads are in many cases under repair.

Air

The Soc. Italiana Servizi Aerei run a daily service to ZARA, connecting with the main ADRIATIC Service.

(11) Signal Communications

W/T Stations

(8) War Material Factories

There are some small chemical works or agencies.

(9) Power Plants

There is an Electric Power Station on the West side of the VIALE dei NAZIONALE, near the Gasometer. It is a fairly large and modern installation and supplies most of the surrounding country. (P.D.)

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Rail

The Railway from ANCONA runs Northward to RAVENNA along the coast, with a junction at FALCONARA where the line branches inland to FOLIGNO. The main line along the coast is practically along the water front for several miles and is intersected at various points by bridges, the first being at the River ESINO. The Railway from ANCONA is continued to the South by a single-track line. This runs to FOGGIA and BARI, etc. An extension of the line is made to the Maritime Station and Harbour. There are extensive locomotive sheds and wagon parks at ANCONA Station.

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The Main Road is the Coast Road to the Northward to RAVENNA which forks at RIMINI inland to BOLOGNA. This Road is in fair condition most of the way. The Road to the South runs to PESCARA-FOGGIA, etc., along the coast. The inland roads are in many cases under repair.

Air

The Soc. Italiana Servizio Aerei run a daily service to ZARA, connecting with the main ADRIATIC Service.

(11) Signal Communications

W/T Stations

There are W/T Stations :—

(i) At the back of the Citadel, where there are two large lattice masts; the buildings are surrounded in barbed wire, as is the rest of the Citadel

(ii) Near Monte CARDETTO Battery.

There is a D/F Station at ANCONA Airport, $43^{\circ} 37' 00''$ N., $13^{\circ} 29' 58''$ E.

V/S Station

The V/S Station is near the Lighthouse at Monte CAPPUCCINI.

Telephone and Telegraph

The Town is on the Telephone and Telegraph System.

Cables

There is a cable to ZARA.

(12) Defences

(i) Sea-Front Defences

(ii) Coast Defence Batteries

No information has been received about the following seven Batteries since 1933, when the position was as follows:—

Battery No. 1. TORRETTE Battery. Nothing observed in vicinity of position marked.

Battery No. 2. A. SAVIO Battery. Large fort on hilltop apparently disarmed.

Battery No. 3. FORT SCRIMA. Practically demolished.

Battery No. 3a. HARBOUR ENTRANCE (i): sited on the Southern Mole: ? 6 guns of 3.9-in. calibre.

Battery No. 3b. HARBOUR ENTRANCE (ii): sited on the Northern Mole: ? 6 guns of 3.9-in. calibre.

Battery No. 4. SAN GIACO. Concrete emplacements only remain.

Battery No. 5. No guns observed.

Battery No. 6. M. CARDETTO. Six guns of about 3-in. calibre in breastwork—visible from seaward. This battery appears to be manned by naval ratings.

Battery No. 7. No guns were seen in this position, which is a fairly large fort.

In June, 1941, ? guns of ? calibre have been reported on the seaward ends of the two breakwaters.

(iii) Searchlights

A probable Searchlight position was observed near the Lighthouse. It is not known whether it is in use as such.

(v) Local Air Defences

(a) Anti-Aircraft Batteries.

A.A. guns have been reported in the vicinity of M. CARDETTO.

No information.

(vii) Garrison

ANCONA is the Headquarters of a Division and, although no details are available, it seems probable that the garrison comprises two Regiments of Infantry and one or two of Artillery, with the requisite Supply Services.

(13) Reconnaissance

To the Northward of ANCONA the foreshore is straight and shingly and well suited for boatwork for several miles. The beach is divided from the immediate land by the railway embankment and a wall.

Further inland the country consists mainly of low hills, except at the mouth of the River ESINO, where it opens into a plain, somewhat marshy, even in summer.

To the South of the Town there are steep limestone cliffs, rendering any sort of landing impracticable, for a few miles until the coast resumes the same characteristics as that to the Northward.

All beaches are somewhat exposed and can be covered in most cases from the hills.

Water should be readily obtainable, especially on the Northern side.

Battery No. 4. SAN GIACO. Concrete emplacements only remain.

Battery No. 5. No guns observed.

Battery No. 6. M. CARDETTO. Six guns of about 3-in. calibre in breastwork—visible from seaward. This battery appears to be manned by naval ratings.

Battery No. 7. No guns were seen in this position, which is a fairly large fort.

In June, 1941, 2 guns of ? calibre have been reported on the seaward ends of the two breakwaters.

(iii) *Searchlights*

A probable Searchlight position was observed near the Lighthouse. It is not known whether it is in use as such.

(v) *Local Air Defences*

(a) Anti-Aircraft Batteries.

A.A. guns have been reported in the vicinity of M. CARDETTO.

No information.

(vii) *Garrison*

ANCONA is the Headquarters of a Division and, although no details are available, it seems probable that the garrison comprises two Regiments of Infantry and one or two of Artillery, with the requisite Supply Services.

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All beaches are somewhat exposed and can be covered in most cases from the hills.

Water should be readily obtainable, especially on the Northern side.

BARI

(Lat. 41° 08' N., Long. 16° 52' E.)

(See Plan 111 and Admiralty Chart No. 199.)

(1) *General Remarks*

BARI, on the Western shores of the Adriatic, is situated about 58 miles North-West of Brindisi and 39 miles South-East by East of Barletta. It is the chief commercial town on the coast, and is now of particular importance as being the port mainly used for the despatch of troops for Albania and Libya. Whereas all troop movements at one time took place from Naples, there is more recently a much greater use of Bari, Brindisi and Barletta. Food and supplies for Albania are being sent via Bari to Durazzo. It has been reported that the provisioning of convoys bound for Albania from Bari is effected at Brindisi or Ancona.

A Naval Base is under construction at Bari, the purpose being to provide a base from which to take offensive action. Warships meantime visit Bari from time to time.

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(2) Port Facilities

General

The Harbour is exposed to swell when the wind is in the North-West, but is well sheltered from other quarters. A cruiser squadron can get alongside the mole and can lie at bow and stern moorings.

Approach is easy, except in strong Northerly winds, when it is usual to wait outside until the weather moderates.

Depth of Water

There is a depth of water of $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms inside the harbour, and a reported intention which may have been carried out, to deepen to 10 fathoms.

Accommodation

Up to 95,000 tons of shipping has been seen in the harbour, exclusive of naval vessels, the largest ship being estimated at 8,500 tons.

Quays, Moles and Jetties

There are two harbours, one of which, the PORTO VECCHIO, is used only by fishing boats. The harbour at the PORTO NUOVO is formed by a mole extending from the Northern part of the town, while an inner mole, known as the MOLO PIZZOLI, extends from the Western part of the town. Good anchorage is afforded for vessels of moderate size.

A new mole, the NUOVO MOLO FORANEO, was completed in 1937. It extends from the root of the old outer mole, which is lined with quays up to the jetty, which has quays on both sides and at its head.

A destroyer basin is reported between the "Y"-shaped mole (MOLO SAN VITO) and the short pier to the South of it, in which up to five destroyers have been seen.

A port Railway Station and sidings are located on the Southern quayside, and standard gauge railway lines extend round the Southern circumference from the "Y"-shaped mole to alongside the Bari Fair buildings. There is, in addition, a light railway coming in from the West of the town and terminating in sidings between the gas works and the standard gauge sidings on the quay.

Lifting Appliances

There is one small 5-ton crane and there are two grain elevators on the old outer Molo.

Estimated Daily Capacity

In the absence of up-to-date information as to development it is difficult to assess capacity, but as an approximate estimate at least 3,000 tons per day could probably be handled, exclusive of M/T, of which for every 100 vehicles unloaded, the amount of Military Stores would be reduced by 400 tons.

Water

There is, under Government control, a plentiful supply of water both for drinking and boilers: pipe lines run the whole length of the quays with connection for hoses at frequent intervals.

There are a number of warehouses.

(3) The Town

The Town stands close to the sea on a low projecting point. The Old Town has narrow, tortuous streets, but the New Town is much larger, is well built, and is continually developing. The population may be up to 200,000.

(4) Government Establishments

Quays, Moles and Jetties

There are two harbours, one of which, the PORTO VECCHIO, is used only by fishing boats. The harbour at the PORTO NUOVO is formed by a mole extending from the Northern part of the town, while an inner mole, known as the MOLO PIZZOLI, extends from the Western part of the town. Good anchorage is afforded for vessels of moderate size.

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Water

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There are a number of warehouses.

(3) *The Town*

The Town stands close to the sea on a low projecting point. The Old Town has narrow, tortuous streets, but the New Town is much larger, is well built, and is continually developing. The population may be up to 200,000.

(4) *Government Establishments*

Barracks:—

- (i) A large barracks, $\frac{1}{4}$ of a mile East-North-East of the main Railway Station.
- (ii) A smaller barracks opposite the Maritime Railway Station.
- (iii) Troops reported quartered in Bari Fair buildings, West of the harbour, South-East of Bari Lighthouse.

There is also a large exhibition ground and building $\frac{1}{4}$ mile South-West of the Maritime Railway Station which may be an annexe to the Fair.

- (iv) An extensive new barracks about $\frac{1}{4}$ mile South of the Bari Fair. It consists of 10 large and 21 small buildings, with five others under construction.

- (v) A barracks is under construction about $1\frac{1}{4}$ miles South of the large barracks near the main Railway Station on the East side of BARI-CEGLIE DI CAMPO road. It consists of 24 "U"-shaped buildings.

Hospitals

There is a Civil and a Military Hospital.

SCARPANTO

SIMI 161

WEST COAST

BEACH "(c)" AGHIOS THEODOROS: there is a sandy beach North of the Cape where a landing could be made from boats in fine weather; but no roads lead inward.

BEACH "(d)" PHINEKI Bight: just inside the Northern part of the bay there is a small mole on the West side. A 50/60-ton caique can go alongside 108 yards from a small road which leads to the main road of the Island. The depth of water close to this mole is reported to be about 2½ fathoms.

BEACH "(e)" GLARES Bay: no particulars.

BEACH "(f)" FISES Bay: here landing is only possible in fine weather: there is a steep path to the village of OLIMBO.

BEACH "(g)" Saint IRENE Bay: There is a sandy beach with good anchorage in Northerly winds.

BEACH "(h)" TRISTOMA Bay: there is a mole where caiques can go alongside in fine weather.

BEACH "(i)" SARIA Bay: landing is impossible both on the North shore of SCARPANTO and on the South shore of SARIA.

KASO ISLAND

BEACH "(j)" Capo KAVO AKTIS. There is excellent landing according to the wind, on either Northern or Southern beaches. (*But see* Plan 89 and paragraph (12)—DEFENCES.)

BEACH "(k)" OPHRIS: landing is extremely difficult in a North wind.

BEACH "(l)" AGIOS IOANNIS Point (or Punta ZANNI): there is a small landing place in a gully in a bay just south of the point. Thence a path, very steep and rough, leads to the villages of POLI, ARVANTOKHORI, and OPHRIS, but it could only be used in very dry weather.

There are no good landing places on the South-East coast.

ARMATHIA ISLAND

BEACH "(m)". There is a landing place on the South East corner of the Island under the lee of the Southernmost point. Some houses are situated 160 yards from the beach. Water is available.

SIMI (and small adjacent islands)

(Lat. 36° 36' N., Long. 27° 51' E. (SIMI Town))

(See Plans 94 and 103)

(1) General Remarks

This group, which consists of the Islands of SIMI, SESKLI and NIMO, and various minor islets, including CONDRO, PLATI, OSSIA, DIAVANTE, MARMARA and COLUNDRO, is situated in the Gulf of DORIS near the Turkish Coast. SIMI is 15 miles West of the North point of RHODES.

SIMI is a mass of hard limestone, deeply dissected and submerged, overlaid with patches of softer marls and ragstone. The coast is irregular and deeply indented: on the North side the DIAPORI Channel, a hundred yards wide and deep enough for small craft (12-15 ft.), separates NIMO Island from the promontory of M. DIAPORI. The highest points are M. VIGLA (2,053 ft.) and M. COCCIMIDI (1,949 ft.) in the centre, and M. CROCE (1,755 ft.)

BARI 177

(5) Commercial Establishments***A.N.I.C. Refinery***

The most important commercial establishment in Bari is the oil hydrogenation plant belonging to the AZIENDA NAZIONALE IDROGENAZIONE COMBUSTIBILI. This plant, together with a similar plant at Leghorn (Livourne or LIVORNO) are the only important refineries in Italy especially equipped to deal with Albanian crude oil. Between them, the plants produced the greater part of Italy's aviation spirit, each refining 185,000 tons of crude oil annually before hostilities. It is reported that bombing led to the temporary disuse of the refinery at Bari. It is not known what proportion of aviation spirit is now produced.

The plant is located 1½ miles South-South-West of the Bari Lighthouse. Its most vulnerable points are the hydrogenation plant, the distillation plant, the cracking plant and the Power Station. There is a pipe-line running from the North-East corner of the refinery to the oil quay at the end of the Western breakwater, and an important electric transformer station is reported immediately to the East of the North-East boundary of the refinery area.

Fuel

(a) *Coal and Patent Fuel.*—There are three firms as follows:—

CAPORUNO MICHELI CARLONI.
STEFANI ANDRIARO CARLONI.
FRATELLI GAROFALO VI VITO.

The controlling interest of each is Italian. A small stock of Welsh and German coal is kept in a dump on shore; average stock 1,000 tons.

Ships berth alongside quays and coal is transported from dump to quays in wagons in bulk, thence it is carried on board in baskets or bags.

(b) *Fuel Oil.*—There are two firms, one deals with Standard Oil Co., and the other with Mexico and Albania; both are Italian. The agent for the Standard and Shell companies is the ships' chandler, Antonio Cianciola.

At the A.N.I.C. Refinery there are Storage Tanks with a total capacity of 150,000 tons for the various products which have been refined; it is possible that oil is piped from the Refinery Storage tanks to the MOLO S. CATALDO.

There is, in addition to the above, an Underground Oil Storage the position of which is not known.

Gas Works

The Gas Works are sited just south of the Maritime Station in the North-West of the Town, in position 182° West end of new Outer Mole, 2,100 yards.

Water Works

The Water Works are sited in the South-West corner of the harbour.

Motor Works

Part of the TURIN Motor Works has been transferred to BARI—site unknown.

Other Factories

An important Soap Factory is situated ¼ mile South-East of the Bari Fair, near the port. There is also reported to be a Cement Factory—location unknown.

Reports have been received that a branch of the Fiat Works has been opened at Bari. Its location is unknown.

South of the town, in position 153° West end of New OUTER MOLE, is an industrial area including a Canning Factory and a number of minor establishments. These adjoin the

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Water Works

The Water Works are sited in the South-West corner of the harbour.

Motor Works

Part of the TURIN Motor Works has been transferred to BARI—site unknown.

Other Factories

An important Soap Factory is situated $\frac{1}{2}$ mile South-East of the Bari Fair, near the port. There is also reported to be a Cement Factory—location unknown.

Reports have been received that a branch of the Fiat Works has been opened at Bari. Its location is unknown.

South of the town, in position 153° West end of New OUTER MOLE, is an industrial area including a Canning Factory and a number of minor establishments. These adjoin the Central Railway Station and Marshalling Yard.

Shipyards

There are two small shipyards situated near the MOLO PIZZOLI.

(7) *Air Facilities*

Aerodrome

The Aerodrome is 3 miles West of the Lighthouse on the West side of the BARI-BARLETTA railway line near the shore of the Adriatic Sea. It is triangular in shape, measuring 1,800 yards by 1,400 yards by 1,400 yards. The surface is grass-covered with no apparent runway. There is a dispersal runway leading to 15 blast shelters, large enough for bomber aircraft, on the Southern and Eastern perimeter. The Aerodrome is also used by fighter aircraft. There are four hangars and eight other buildings in the South-West corner of the aerodrome, as well as an ammunition hut protected by a thick blast wall.

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178 BARI**(9) Power Plants**

The Electric Power Station is sited in position 182°, West end of new Outer Mole, 2,100 yards adjoining the Gas Works.

(10) Transport Facilities**Rail**

BARI is on the main East Coast Railway and is at the junction of that line with the line which crosses inland to TARANTO. A steam tramway runs to BARLETTA.

The Central Railway Station lies to the South centre of the Town: the Marshalling Yard is conspicuous from the air.

The Maritime Station is sited on the South side of the PORTO NUOVO: lines serve the MOLO PIZZOLI, MOLO S. VITO and the Customs' House Mole. These lines connect with the main line.

Roads

BARI is on the main coast road which runs alongside the railway North-Westward and South-Eastward to BARLETTA and BRINDISI respectively.

There are also two other main roads, one to TARANTO and another to ALTAMURA, which is a main road junction for all parts of Italy.

There are also two minor roads out of BARI: one to ACQUAVIVA and the other to SANTERAMO.

(11) Signal Communications**W/T**

There are two Broadcasting Stations at Bari, of which the more powerful is the well-known propaganda station. The smaller one is in the neighbourhood of the Fiera del Levante. The other station, which is reported to be easily recognisable from its many pylons, is thought to be in or near the village of Ceglie Di CAMPO, about 4 miles to the South of Bari.

(12) Defences**(i) Sea Front Defences****(a) Coast Defence Batteries**

Battery No.	Name, Location and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	Sited on the OUTER Mole	4-4-in.	B.2	B.2	1941
2	North-West of BARI—sited on the coast, exact position not known.	4-4-in.	B.3	B.2	1941
3	South-East of BARI—sited on the coast	4-4-in.	B.3	B.2	1941
4	Sited 400 yards South-East of the last houses of BARI, exact position not known.	4-4-in.	A.3	B.2	1941

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BARI is on the main coast road which runs alongside the railway North-Westward and South-Eastward to BARLETTA and BRINDISI respectively.

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4	Sited 400 yards South-East of the last houses of BARI, exact position not known.	4-4 in.	A.3	B.2	1941

(ii) Movable Armament

None reported.

(iii) Searchlights

None reported.

Magazines

Two important dumps of war material are reported, one on MOLO PIZZOLI, the other on MOLO CAPITANERI.

(iv) Local Seaward Defences

(a) *Minefields*.—BARI is defensively mined.

(b) *Booms and Nets*.—An anti-submarine net is reported across the Inner Harbour.

There is a boom across the entrance to the Outer Harbour.

BARI
BARLETTA 179

(v) Local Air Defences
(a) Anti-Aircraft Batteries

A.A. Battery No.	Name, Location and Description.	Armament.	Grading.	Date of Latest Report.
A.A.1	Sited 400 yards South-East of last houses in BARI.	4-3-in. ..	A.3	1941
A.A.2	Sited about 2½ miles South-East of Main Railway Station.	4-? calibre ..	A.3	1941
A.A.3	Sited about 1 mile South-East of Main Railway Station.	4-? calibre ..	A.3	1941
A.A.4	Sited on the roof of an old church marked with yellow and white Papal flag, near the Regiment Elena Barracks.	? No and calibre ..	B.5	1941
A.A.5	Sited on Northern arm of Y-shaped Mole.	4-3-in. ..	A.3	1941
A.A.6	Sited on Southern arm of Y-shaped Mole.	4-3-in. ..	B.3	1941
A.A.7	Sited ½ mile West of Refinery ..	4-? calibre ..	A.3	1941
A.A.8	Sited South of the Salt pans ..	4-? calibre ..	A.3	1941
A.A.9	Sited North-East of the Salt pans ..	? No. and calibre ..	A.5	1941

BARLETTA

(Lat. 41° 19' N., Long. 16° 17' E.)

(1) General Remarks

BARLETTA is used for the embarkation of troops for the DODECANESE. Otherwise it is of little importance.

(2) Port Facilities

The Harbour is situated North-East of the Town and is formed by two Moles. The Western Mole extends in a North by West direction for 1,500 ft., it then curves East at right-angles for about 700 ft. then North-East for 800 ft. and finally East by North for 800 ft.

The Eastern Mole extends Northwards from a point 900 yards to the Eastward of the root of the Western Mole and has a total length of 4,400 ft.

The Western Mole is lined with quays which are connected to the Main East Coastal Railway. There are no quays on the Eastern Mole.

Vessels of 16-ft. draught can enter the Port and lie alongside the Western Mole. In the outer part of the Harbour there are depths of 3 to 4 fathoms; the inner part is shallow and the depths are less than 2 fathoms.

Lifting Appliances

There are small Travelling Cranes on the Quay near the Harbour Master's Office.

Water

Water is laid on to the Quays.

Repairs

Small repairs can be carried out.

A.A.5	Sited on Northern arm of Y-shaped Mole.	4-3-in.	..	..	A.3	1941
A.A.6	Sited on Southern arm of Y-shaped Mole.	4-3-in.	..	..	B.3	1941
A.A.7	Sited 1/2 mile West of Refinery	4-? calibre	..	..	A.3	1941
A.A.8	Sited South of the Saltpans	4-? calibre	..	..	A.3	1941
A.A.9	Sited North-East of the Saltpans	? No. and calibre	..	..	A.5	1941

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Water

Water is laid on to the Quays.

Repairs

Small repairs can be carried out.

(3) The Town

The streets are well paved and the houses large and lofty. Conspicuous buildings are the Cathedral and Castle. The population is about 50,000.

The principal imports consist of wood, coal, cereals, charcoal, sulphur, sulphate of copper and mineral oils. Exports are wine, brandy, olive oil, acids, salt, cement and wine casks.

Hospital

There is a Civil Hospital with 150 beds.

(5) Commercial Establishments**Oil Fuel**

There are four Oil Storage Tanks sited on the Harbour front half-way between the roots of the two Moles; these contain a total of 1,000 tons of oil fuel.

Coal

Coal is procurable in small quantities.

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BRINDISI

(10) **Transport Facilities**

Rail

BARLETTA is on the Coast Railway and is also connected with BARI by steam train.

Roads

The main coastal road passes through BARLETTA South-Eastward to BARI and BRINDISI and North-Westward to VIESTE.

There is another main road from BARLETTA through CANOSA to CERIGNOLA and FOGGIA where there is a road junction to all parts of ITALY. There is also another main road to BARI via ANDRIA, CORATO, RUVO and BITONTO. There is also a secondary road direct to FOGGIA.

(12) **Defences**

Coast Defence and A.A. Batteries

No information available.

Minefield

A Minefield is reported in the approaches to BARLETTA.

BRINDISI

(See Plans 4, 5 and 6)

(1) **General Remarks**

BRINDISI is the best anchorage for large vessels on the West side of the ADRIATIC and occupies an important position near the entrance. Both the Naval and Commercial Ports are under the control of the Naval authorities, and the Harbour is a Secondary Base of the Italian Fleet. It is used for embarking troops and military stores destined for DURAZZO. It is within easy reach of the Naval Dockyard at TARANTO.

(2) **Port Facilities**

The Southern smaller branch of the Inner Harbour is used by merchant ships and occasionally by Naval units which anchor off the shore on the Eastern side.

Some massive concrete warehouses have been erected on the Eastern extremity of the town between the points marked "Goods Station" and "Office" on Admiralty Chart 1492.

A 10,000-ton Cruiser can now lie and oil at the Quay immediately to the East of the Oiling Piers. Being situated close to the oil tanks, it is probable that an oil pipeline has been built for refuelling large Destroyers.

Just South of the PIGONATI Channel, there is what appears to be a large Transhipment Stores Depot, with a railway and new road connecting it to the main town.

Lifting Appliances

There are three Floating Cranes, which appear to be :—

- (i) Steam, 30 tons,
- (ii) and (iii) Electric, also of about the same lift. There is a small pier with 2-ton crane

No information available.

Minefield

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Lifting Appliances

There are three Floating Cranes, which appear to be :—

- (i) Steam, 30 tons,
- (ii) and (iii) Electric, also of about the same lift. There is a small pier with 2-ton crane reported on TRAVERSA Island, North-West point of PEDAGNA Rocks.

Floating Docks

There is a Floating Dock numbered G.O.11 with a lift of 2,000 tons. It is moored near the Submarine Piers.

There is a Commercial Floating Dock with a lift formerly believed to be 4,800 tons, now thought to be considerably less than this figure.

Slipway

The new Patent Slipway is being enlarged to haul a 1,000-ton Destroyer.

(3) The Town

The Town is unhealthy owing to the marshy land in the vicinity.

(4) Government Establishments*Naval Establishments*

The Naval Port is situated in the Northern branch of the Inner Harbour and is the Base of certain Destroyer and Submarine Flotillas attached to the Italian Fleet. It comprises:—

- (a) Berths for Destroyers consisting of buoys and stout timber pontoons about 540 ft. long on concrete piles, built out from the shore to permit such vessels to come along-side if required. Destroyers usually secure stern to bollards on the pontoons and bows to the buoys.
- (b) A Torpedo Pier about 150 ft. long provided with two $\frac{1}{2}$ -ton overhanging Cranes. A tramway is laid along the Pier.
- (c) Pontoon berths for Destroyers similar to those in (a) 210 ft. long.
- (d) Berths for Submarines formed by a pontoon 240 ft. long with three arms projecting from it about 90 ft. in length.
- (e) Pontoon berths for Destroyers, 360 ft. long.
- (f) Torpedo Repair Shop and Torpedo Store. The store has accommodation for about 300 torpedoes, and is situated in the lower galleries of the Castle, and connected with the workshop by trolley lines and a lift.
- (g) Distilling Plant on East side of the Old Castle.
- (h) DIFESA MARITTIMA Barracks in the Old Castle consisting of Offices, Quarters for petty officers and men, and a Hospital with 100 beds.

Destroyers are reported to moor in roadstead due South of words " Naval War Memorial ". (See C.B. Plan 4.)

Barracks

The Commercial Seaplane Hangars are, at present, used as Barracks for Airmen belonging to the Air Force.

There are Military Aviation Camps at SAN VITO, CALIMEA and LECCE near BRINDISI.

Oil Fuel Storage

A Naval Oil Fuel Depot is situated at the Southern end of the South arm of the Inner Harbour, and is surrounded by a high stone wall. The oil is stored in tanks as follows:—

- 12 tanks of 1,000 tons capacity.
 - 5 tanks of 2,000 tons capacity.
- In addition there is storage for 5,300 tons of special oil for Submarines.

Oil tanks are camouflaged.

Patent Fuel Factory

There is an important Patent Fuel Factory situated in the Inner Commercial Port about 350 yards South of the Harbour Station.

(7) Air Facilities*Seaplane Stations*

There are seven hangars with six slipways immediately North of PIGONATI Channel, four more large hangars (capacity for about 12 CANT. Z.506 B.), and two large cranes farther to the North. Farther North still are two more large hangars, used in pre-war days for commercial purposes. There are also flying-boat moorings North-West and West of the floating dock.

Sunken tanks for aviation petrol exist immediately behind each of the two groups of

- (f) Torpedo Repair Shop and Torpedo Store. The store has accommodation for about 300 torpedoes, and is situated in the lower galleries of the Castle, and connected with the workshop by trolley lines and a lift.
- (g) Distilling Plant on East side of the Old Castle.
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Sunken tanks for aviation petrol exist immediately behind each of the two groups of seaplane hangars on the Northern side of the Outer Harbour. Another sunken tank has been spotted in between the two large commercial hangars farther north.

Naval Port

A Seaplane Station is situated in position 40° 38' 25" N., 17° 55' 37" E., at the entrance West of the Naval Port, about three-quarters of a mile from BRINDISI Central Station.

Dimensions

The alighting area in the Naval Port is restricted, maximum dimensions being about 400 yards North-South and a possible 900 yards East-West.

Hangars and Buildings

There are two hangars, and in front of them four narrow sheds, and nearby a number of large buildings.

(L46758)

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Aerodromes

There are two aerodromes at BRINDISI as follows:—

- (a) Situated North-West of the seaplane hangars. The landing ground measures 1,425 yards from West to East, and 1,200 yards from North to South. The hangars (number unknown) and auxiliary buildings are on the south side of the landing area, and barracks exist to the South-East of them. A runway has been under construction measuring 860 by 57 yards lying North and South and is connected to the hangars by a small concrete strip. Encircling the aerodrome, dispersal points have been constructed.
- (b) The other aerodrome is at SAN VITO DEL NORMANNI, 6 miles West of the port and South of the Bari road.

(9) Power Plants

Electric Power for the Naval Port is obtained from the SILA Plant: the reserve plant consists of four oil engines of total power 1,500 H.P.
The position of the Town Power Station is not known.

(10) Transport Facilities

Railways

Single lines run Northward to BARI, Southward to OTRANTO and GALLIPOLI, and Westward to TARANTO.

The TARANTO and GALLIPOLI lines run inland and do not approach the coast again in the vicinity of BRINDISI. The line to BARI runs inland for about 5 miles, but approaches the coast again about 10 miles to the North of BRINDISI. The Central Railway Station is on the South-West side of the Town. A branch line runs along the Quays on the East side of the Town.

(11) Signal Communications

W/T Station

Medium-power W/T Stations situated behind the Air Force Barracks on the South side.

Submarine Cable

Cable to PORT EDDA in ALBANIA and one to VALONA. See "Submarine Telegraph Cables, Mediterranean, Black, and Red Seas (Fleet Telegraph Chart Folio OT.)".

D/F Station

There is an Adcock D/F Station at the Aerodrome at ST. VITO DEI NORMANNI near BRINDISI: the Control Room is sunk flush with the ground and approached by a trench.

(12) Defences

The coast for many miles North and South of BRINDISI is remarkable for the large number of Control and Observation Towers which are situated at intervals of about a quarter of a mile at a distance from the coast varying from a few yards to a mile. Their size varies from seven storied buildings to single storied square towers. Most are unoccupied and not concealed. All batteries except No. 10 are in telephonic communication with BRINDISI by twin lines.

(i) Sea Front Defences

(a) Coast Defence Batteries

BATTERY No. 1—C. CAVALLLO (1): Four guns of 6-in. calibre.—With shields mounted on pedestals on the sand dunes without any parapets: large arcs of fire: Control Position close in rear of guns: no Magazine or Searchlights observed.

BATTERY No. 2—C. CAVALLLO (2): Six howitzers of 12-in. calibre.—Large modern work with guns mounted behind a high parapet, but guns not visible from seaward. High

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BATTERY No. 2—C. CAVALLLO (2): Six howitzers of 12-in. calibre.—Large modern work with guns mounted behind a high parapet, but guns not visible from seaward. High wall in rear of Fort. Control Tower situated about 900 yards in rear.

BATTERY No. 3—C. BLANCO: No guns mounted.—Positions for Six guns of 6-in. calibre. Low circular Tower is situated at each end of Battery: no Searchlights observed; Battery is not protected from rear.

BATTERY No. 4—PTA FIUME GRANDE: ? Six guns of 6-in. calibre.—Strongly fortified position, surrounded by high walls with only an entrance in rear through a steep cutting. Guns well placed to command the Outer Roadstead.

BATTERY No. 5—PEDAGNE GRANDE: Two guns of 15-in. calibre.—Mounted in a Turret on a large semi-circular emplacement: sub-calibre guns on top: Turret has all round fire with two Observation or Searchlight Positions. A high tripod mast is situated 1,000 yards in rear by No. 3 Battery which is presumably the Turret Control Position.

BATTERY No. 6—LA CHIESA ISLAND: One gun of 4-in. calibre.

BATTERY No. 7—MONA-CELLO ISLAND: One gun of 6-in. calibre.

BATTERY No. 8—S. ANDREA: Four guns of 6-in. calibre.

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BATTERY No. 8A—LUNGA PT.? Two or ? guns of ? 15-in. calibre, mounted in one turret.

BATTERY No. 9—LICOLA PT. Two guns of 15-in. calibre.—Mounted in Turret exactly similar to No. 5: Observation or Searchlight Position situated close to Northward of Turret: Control or Observation Tower to Southward as shown on Plan. Control probably carried out in tripod mast Control Top situated 900 yards to S.E. of Turret.

BATTERY No. 10—LOPIA POINT: Two guns of ? 15-in. calibre.

BATTERY No. 11—SIRRONE POINT: Four guns of ? 6-in. calibre.—Guns are mounted on top of a parapet at small intervals: very conspicuous from seawards: these guns may be of 11-in. calibre or old 12-in. converted to 6-in. Magazine 200 yards to North of Battery. Control Position 500 yards to Westward.

BATTERY No. 12—C. GALLO: ? Six to nine howitzers of 12-in. calibre.—Large modern work similar to No. 2: Fort very hard to see from seaward: Observation or Searchlight Position situated close to Westward of Fort.

Beach Defences

About 11 miles north of BRINDISI, on the shore, there is reported to be an old square stone Tower: in this Tower, which is manned, are H.A./L.A. or machine-guns.

Further Batteries Projected

Positions have been inspected near the coast which are intended for guns of long range and probably of at least 12-in. calibre.

The arrival of four guns of 15-in. (?12-in.) calibre has been reported.

It is apparently the intention that these guns, when mounted, in conjunction with those already mounted on SASENO Island, will enable the Italians to control the Straits of OTRANTO.

Gun Emplacements

A large number of disused gun emplacements have been located along the coast to the Northward and Southward of the Port: some of these may be brought into use.

Magazines

Heavily entrenched and carefully guarded iron buildings with special safety fittings to protect them from lightning exist in the following positions:—

- (i) About 900 yards in rear of C. CAVALLIO Battery.
- (ii) About 400 yards to the North-Eastward of the Conspicuous Chimney at BONIFICIO.

The Magazines for Nos. 9 and 11 Batteries have been located, as shown on Plan 4, near LICOLA Point and South-West of SIRRONE Point and there is every probability that Magazines exist close to the remaining Batteries.

(iii) *Searchlights*

The following Searchlights have been located.

- (a) Two in the vicinity of BATTERY No. 2.
- (b) The Naval War Memorial mounts a searchlight at the top.
- (c) One on the Island of ST. ANDREA.
- (d) One near the Semaphore on Fort MARE.

Sound Locator

An instrument—believed to be a Sound Locator—is mounted on a small tower on Fort MARE, just behind the Searchlight.

(iv) *Local Seaward Defences*

Minefield

The approaches to the Port are mined. The most prominent objects seen when approaching the Harbour are four square buildings situated close to the shore, two to the Southward and two to the Northward of the Harbour. Owing to their great height (over

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Minefield

The approaches to the Port are mined. The most prominent objects seen when approaching the Harbour are four square buildings situated close to the shore, two to the Southward and two to the Northward of the Harbour. Owing to their great height (over 100 ft.) it is probable that they are fitted with some Depression Position-Finding Apparatus for use with Observation Minefields. They face North-East.

At least 400 mines are stored in Fort MARE on ST. ANDREA Island, but their nature has not been determined.

A light buoy is moored close South-Westward of the occulting red light at the head of the South Breakwater between the Inner and Outer Roads. A line of floats, parallel to the Breakwater, extends from this buoy to the shore. (See Chart No. 1492.) These floats support an Electric Flare Path used for guiding Seaplanes into the Harbour.

Booms (A.2 1942)

Two parallel single-line Booms, 393 yards and 300 yards in length, stretch across the Harbour entrance from Fort MARE to the opposite Breakwater.

A three-sided double-line Boom protects the Battleship IMPERO lying against the shore. (July, 1942)

Beyond the PIGONATI Channel are three short lengths of Boom not in use.

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(v) *Local Air Defences.* (Reference to Plan 4: Admiralty Chart 1492)

(a) *A.A. Batteries*

A.A. Machine-guns are mounted on Fort MARE and at the Northern end of ST. ANDREA Island.

A.A. BATTERY No. 1—BONIFIGIO.—Sited in sunken pits in a North-South Line, on the coast, 400 yards North-East of the conspicuous chimney; eight A.A. guns of 3-in. calibre.
A.A. BATTERY No. 2—MASSA ZACCARIA.—Sited half mile South-West of MASSA ZACCARIA; ? A.A. guns of ? calibre.

A.A. BATTERY No. 3—BANCHINA PIGNATTI.—Sited on the South-East side of the PIGNATTI Channel; ? A.A. guns of ? calibre.

A.A. BATTERY No. 3a—CEMETERY.—Sited in pits 600 yards South by East from Cemetery South of Naval Oil Tanks; 2 ? 4 A.A. guns of 3-in. calibre.

A.A. BATTERY No. 4—BRINDISI.—Sited on the Easternmost corner of the Town near a Factory; ? A.A. guns of ? calibre.

A.A. BATTERY No. 4a—BARI ROAD.—Sited in pits 1½ miles on the road to South VITO and BARI; 4 A.A. guns of 3-in. calibre.

A.A. BATTERY No. 5—COMMERCIAL SEAPLANE HANGARS.—Sited quarter mile North-East of the Commercial Seaplane Hangars; ? A.A. guns of ? calibre.

A.A. BATTERY No. 6—CASTELLO.—Sited in the Southern part of ST. ANDREA Island; ? A.A. guns of ? calibre.

A.A. BATTERY No. 7—ST. ANDREA.—Sited in the East part of the Island; four A.A. guns of ? 4-in. calibre.

A.A. BATTERY No. 8—CALA MATER DOMINI.—Sited immediately east of the Cala; ? A.A. guns of ? calibre.

A.A. BATTERY No. 9—LICOLA PT.—Sited on the 15-in. gun turrets or in concrete pits nearby; ? A.A. guns of ? calibre.

A.A. BATTERY No. 10—LOPIA PT.—Sited on the 15-in. gun turrets or in concrete pits nearby; ? A.A. guns of ? calibre.

A.A. BATTERY No. 11—MONTICELLI.—Sited South of a copse and South-West of farm buildings of MONTICELLI Farmhouse; six A.A. guns of 3.9-in. calibre; these guns are arranged in a line running North-West and South-East and are separated by embankments breast high.

A.A. BATTERY No. 12—LAURENTIS FARM.—Sited South-East from the Farm and West by South from MONTICELLI; ? A.A. guns of ? calibre.

A.A. BATTERY No. 13—MADONNA DEL CASALE.—Sited half mile to the West of the building; ? A.A. guns of ? calibre.

The Main Railway Station is defended by heavy and light A.A. guns.

(b) *Balloon Barrage*

There are eight Balloons near the Oil Tanks, three by the Patent Fuel Factory, and three by the Seaplane Station in the Naval Port (A.I.).

Balloons have also been seen flying North of the Town. They are known to have been flown at 4,000 ft. (A.I.).

(c) *Aircraft Sound Detectors*

An Aircraft Sound Detector is sited in rear of Coast Defence Battery, No. 4.

(d) *A.A. Searchlights*

These have been located as follows:—

- (a) One mile South of Seaplane Hangars.
- (b) One near the Old Fort on the Breakwater.
- (c) One near the Aerodrome.
- (d) One near A.A. Battery, No. 2, 200 yards to South-West.

(e) *Rangefinders*

Rangefinders have been reported as follows:—

- (1) To South of Coast Defence Battery No. 8A.

A.A. BATTERY No. 5—COMMERCIAL SEAPLANE HANGARS.—Sited quarter mile North-East of the Commercial Seaplane Hangars: ? A.A. guns of ? calibre.

A.A. BATTERY No. 6—CASTELLO.—Sited in the Southern part of ST. ANDREA Island: ? A.A. guns of ? calibre.

A.A. BATTERY No. 7—ST. ANDREA.—Sited in the East part of the Island: four A.A. guns of ? 4-in. calibre.

A.A. BATTERY No. 8—CALA MATER DOMINI.—Sited immediately east of the Cala: ? A.A. guns of ? calibre.

A.A. BATTERY No. 9—LICOLA PT.—Sited on the 15-in. gun turrets or in concrete pits nearby: ? A.A. guns of ? calibre.

A.A. BATTERY No. 10—LOPIA PT.—Sited on the 15-in. gun turrets or in concrete pits nearby: ? A.A. guns of ? calibre.

A.A. BATTERY No. 11—MONTICELLI.—Sited South of a copse and South-West of farm buildings of MONTICELLI Farmhouse: six A.A. guns of 3.9-in. calibre: these guns are arranged in a line running North-West and South-East and are separated by embankments breast high.

A.A. BATTERY No. 12—LAURENTIS FARM.—Sited South-East from the Farm and West by South from MONTICELLI: ? A.A. guns of ? calibre.

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- (c) One near the Aerodrome.
- (d) One near A.A. Battery, No. 2, 200 yards to South-West.

(e) Rangefinders

Rangefinders have been reported as follows:—

- (1) To South of Coast Defence Battery No. 8A.
- (2) To North of A.A. Battery No. 5.
- (3) To South of Control Tower, South of Coast Defence Battery No. 4.
- (4) On top of the War Memorial.

(f) Smoke Screen

The release of a Smoke Screen is part of the A.A. defences of BRINDISI.

(13) Reconnaissance

Landing Places for Troops

Although the sandy coast to the Northward and Southward of BRINDISI is favourable for landing operations, and cover would be afforded by the sand dunes close to the shore, it would be a matter of considerable difficulty to manoeuvre to the Southward of BRINDISI during the rainy season due to heavy going and marsh land in rear of sand dunes. The coast to the Northward of BATTERY No. 12 is very favourable for landing operations. It is well to bear in mind that the coast is well watched and that guns may be encountered at short intervals along this portion of the coast.

CASTELLAMARE DI STABIA 185

CASTELLAMARE DI STABIA

(Lat. 40° 41' 30" N., Long. 14° 28' 30" E.)

(See Plans 8 and 9)

(1) General Remarks

CASTELLAMARE is situated 15 miles South of NAPLES, and is of importance, owing to its Naval Dockyard, which is reported to be busy on Naval repair work. The principal landmark is a high Silo similar in appearance to the grain silos at LEGHORN and GENOA.

In the Bay there is an Open Anchorage; the enclosed Harbour is small and is divided into two parts by the MOLO DI PONENTE.

To the Westward of this Mole is the Naval Port and the Royal Dockyard.

The harbour has been well developed in recent years but the latest Italian charts do not show this development and the extent of it is not known. It has been reported that there is a well-equipped Submarine Base but there is no information that it is being used as such.

(2) Port Facilities

The height of the Southern Quay and the MOLO DI LEVANTE (the Breakwater to the Eastward of MOLO DI PONENTE) is 4 ft. above sea-level, and the least depth of water alongside is 1½ fathoms. The Harbour, therefore, affords good facilities for embarking and disembarking troops.

There are also good landing places to the North-East of the MOLO DI LEVANTE, in the small Harbour enclosed by the rocky Breakwaters. There are, however, no lights on these Breakwaters.

The Railway runs along the quay and into the Royal Dockyard, as shown on Admiralty Chart No. 1400.

Estimated Daily Capacity.

1,500 d.w. tons stores, exclusive of M.T., of which for every 100 vehicles unloaded, the amount of Military Stores would be reduced by 400 tons.

Lifting Appliances

Small Dockyard Cranes.

The Naval Authorities own a Floating Crane capable of lifting 40 tons: there are also two small floating cranes.

Docks

	Length	Width at Entrance	Depth	Lifting Capacity
Floating Dock No. 1	380'	46'	39' 4"	2,000 tons
Floating Dock No. 2	347' 9"	85' 4"	39' 4"	1,600 tons

The above docks were not in the harbour in January, 1942: it is not known where they now are.

(3) The Town

The town lies Eastward of CASTELLAMARE Harbour and consists of two main streets running parallel with the coast for about a mile. It is built on the slope of Monte d'AURO, from which flow the medicinal springs which gave CASTELLAMARE its reputation.

The Office of the Captain of the Port is shown on Admiralty Chart 1400. The Militia Headquarters are in the Town, about 10 minutes walk from the landing place.

Population

The population in 1936 was about 43,500.

Hospital

There is a Hospital in the Town, position not known.

(4) Government Establishments

Rope Factory

The height of the Southern Quay and the MOLO DI LEVANTE (the Breakwater to the Eastward of MOLO DI PONENTE) is 4 ft. above sea-level, and the least depth of water alongside is 1½ fathoms. The Harbour, therefore, affords good facilities for embarking and disembarking troops.

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(4) Government Establishments

Rope Factory

This is the only Government Rope Factory in ITALY. It is situated in the Navalmeccanica Yard of which it occupies a large portion, and produces nearly all the hemp rope required by the Army and Navy. No manilla or grass hawsers are made. The Factory is well organised and efficient and the quality of the rope made is excellent.

(5) Commercial Establishments

"Navalmeccanica"

This Shipyard is the old Royal Dockyard and was purchased by the above company in 1939. It is one of the oldest Yards in ITALY. It occupies a somewhat cramped situation which restricts development, but previously some of the largest ships of the Navy were built there. The Yard has done little work lately beyond the building of Barges and repairs to Submarines. The Light Cruiser "Giulio Germanico" was, however, laid down in 1939.

A new Machine Shop has been built to the North of No. 1 Slip, and is well equipped with machinery of British manufacture. A large Workshop is situated parallel to No. 1 Building Slip. The Workshop is provided with 5-ton Electric Overhead Cranes. There are four slips,

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The most Northerly one is a patent Slip with hauling gear housed in the building marked "E" on Plan S. Four 25-ton Electric Cranes with an overhang of 50 ft. and a hook height of 100 ft. are provided for use with the Building Slips. Electric welding is stated to be in use to a limited extent.

The Shipbuilding Yard undertakes the construction of hulls and Self-Docking Floating Docks.

The machinery in general is worked from a modern Electric Power Station, with one turbo-dynamo and three steam-driven alternators, giving a total power of 1,180 kW., used for driving all the machines in the Yard and also for lighting purposes. The total personnel of the Yard is 2,000 men.

Consorzio Cooperativo per Costruzioni Navali

Shipbuilding Yard situated at POZZANO Point, about $\frac{1}{2}$ mile West of CASTELLAMARE. It was formed during an emergency for the construction of ships made of wood, owing to shortage of steel. Cargo vessels up to 7,000 tons displacement are constructed by the Yard. Two electrical transformers are installed, for transforming the high voltage current from the Ente-Volturno to work all electrically-driven machine tools. There is one inclined masonry Slip for ships up to 460 ft. Three Broadside Slips were under construction in 1918, to take ships 328 ft. in length.

The Royal Dockyard is small and only capable of building small craft, and there appears to be no intention of enlarging or improving it. The main point of interest is that rope for the Italian Navy is made at this Yard.

Fuel

There are no commercial firms supplying or stocking Fuel but the Navalmeccanica Yard normally keep a stock of 1,000 tons of Fuel, the Storage Capacity being about 4,000 tons. They also keep a stock of 5,000 tons of Coal and a small Stock of Petrol.

(6) Aircraft Factories

The A.V.I.S. Air Frame Works are situated about 1 mile North-North-East of the Town between the words "MADDER FACTORY" and "FOUNDRY" on Admiralty Chart No. 1728. 1,500 men could probably be employed in the existing Shop. Output is probably not higher than six Aircraft per month but this number could be considerably increased given men and materials in the space available. 800 men are at present employed but the number could be increased in the existing shop to 1,500. It is a branch of the CAPRONI Works.

(7) Air Facilities

Seaplane Station (Service)

Situated on the sea front, 1 mile to the Northward from CASTELLAMARE. It has not been possible to gain admission, or to discover the number of Planes there. The Hangars are situated 1.5 miles, 012° from Gp. Fl. Light on MOLO DI PONENTE.

The Harbour would not appear to be ideal for a Seaplane Base. During the summer months a North-West wind (about force 3) gets up about mid-day and causes a short, steep sea in the bay. It is considered, however, that landing would be possible. The wind drops completely at sunset.

There are Repair Facilities at the Dockyard and Seaplane Station.

There is a normal Slipway, but no Cranes have been seen at the Station.

The sandy beach running Northward along the coast from CASTELLAMARE is very steep and narrow, and is not considered suitable for beaching Aircraft.

(8) War Material Factories

Just outside CASTELLAMARE, half a mile inland from the sea road to NAPLES, at the Eastern end of the Town, there is a new Munition Factory which produces shells and cartridges and other munitions from the steel ingot stage.

(9) Power Plants

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(9) Power Plants

No information available.

(10) Transport Facilities

Rail

Main Railway NAPLES to SALERNO, branch from TORRE ANNUNZIATA to CASTELLAMARE.

The double track Railway to NAPLES runs Northward along the coast. A single track branch runs along the coast Southward to GRAGNANO.

Road

The Roads are cobbled for some distance out of the Town, but are fairly good.

(11) Signal Communications

Usual Telegraph and Telephone Services.

(12) Defences

The Coast Defences and A.A. Defences are included in the Defence Scheme of NAPLES, which see.

CROTONE 187

CROTONE

(Lat. 39° 05' N., Long. 17° 08' E.)

(See Plan 112 and Admiralty Chart No. 198)

(1) General Remarks*Description*

CROTONE is a small commercial port situated about 80 miles Southward of TARANTO and 5 miles North-Westward of CAPE COLONNE.

Zinc concentrates are imported: these pass through a fertiliser plant and are re-exported in large coasters, in the form of fertilisers.

Anchorage

There are anchorages about a mile and 2½ miles respectively South-Eastwards towards Cape COLONNE, in depths of about 7 and 8 fathoms. Small vessels can anchor further in shore in depths of about 4 fathoms. The holding ground is good but the anchorages are exposed to winds from the Eastern semi-circle.

Tides and Currents

A high water level in summer indicates the approach of bad weather from between South-West and South-East.

A low water level in summer indicates that fine weather may be expected, but in winter that Northerly winds, perhaps of great force, are probable.

A South-going current runs about 2 miles off shore: close to the harbour currents are weak and variable.

In fresh Easterly winds the sea breaks at the mouth of Porto VECCHIO and makes entrance dangerous.

Conspicuous Objects

These include a fort, with high bastions, 2 large factories which are visible 10 miles, and the cemetery, surrounded by a low wall, situated about a mile Southward of the town.

(2) Port Facilities

(a) PORT VECCHIO, which affords good shelter, lies East-South-Eastward of the town and is protected from the Eastward by a breakwater.

Dredging operations, with the object of deepening the whole harbour to 20 ft., were in progress in 1936.

Accommodation

This harbour can accommodate four or five vessels up to 230 ft. in length and drawing 16 ft.: they can secure to the quays except on the Northern and North-Eastern sides of the inner part of the harbour, which are fronted by a shoal bank.

Vessels can also go alongside the Southern side of a pier which extends South-Eastward from the middle of the Western side of the harbour.

Boats can, in favourable circumstances, go alongside a small pier named SANITA.

(b) Porto NUOVO, the larger of the two harbours, is situated North-Eastward of the town.

It is protected by a breakwater on its Eastern side which extends 4½ cables North-North-Westward: on the Westward side there is a mole extending 2 cables North-North-Eastward.

Dredging operations, with the object of deepening to 30 ft. the entrance and the harbour, with the exception of its Southern part, were in progress in 1936.

Cape COLONNE, in depths of about 7 and 8 fathoms. Small vessels can anchor further in shore in depths of about 4 fathoms. The holding ground is good but the anchorages are exposed to winds from the Eastern semi-circle.

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Dredging operations, with the object of deepening to 30 ft. the entrance and the harbour, with the exception of its Southern part, were in progress in 1936.

Accommodation

There are two berths for vessels up to 330 ft. in length, drawing 26 ft., alongside the mole. In 1937 there was 27 ft. of water in the outer berth and 17 ft. in the inner: dredging was in progress.

Four vessels drawing less than 16 ft. can secure to the quays near the root of the breakwater. Other quays cannot be approached within 230 ft. on account of shoals.

Method of Discharge

There are several modern cranes on the quays, the largest of which can lift 9 tons: cargoes are discharged by grab into railway trucks.

Coal

A small stock of coal is available.

Water

Water is laid on to the quays: supply limited in summer.

CROTONE
188 **FERRAJO, PORTO (ELBA)**

Repair Facilities

Repairs to the hull and machinery of small vessels can be carried out.

Facilities for Clearing Port Area

There are railway sidings in the port.

(3) The Town

The town has a population of 20,000.

There is a Civil Hospital situated in the South-Western outskirts.

(5) Commercial Establishments

About a mile from the Porto Nuovo there is a mill in which zinc concentrates are treated for the production of fertilizers.

There are two other large factories.

(10) Transport Facilities

Road and Railway

The main coastal road and railway pass through CROTONE

(11) Signal Communications

Except for a report of a D/F Station at CROTONE, there is no information.

(12) Defences

None have been reported.

FERRAJO, PORTO (ELBA)

(Lat. 42° 49' N., Long. 10° 20' E.)

(See Plans 28 and 28A)

(1) General Remarks

The Port has been developed as a small Submarine and Light Craft Base with facilities for re-fuelling. It is suitable for use by Cruisers and a very few Capital Ships. Its importance is principally due to the Iron Ore trade which is referred to in paragraph (5).

The roadstead of Porto FERRAJO has depths of from 14 to 22 fathoms at the entrance, gradually decreasing within.

Anchorage

There is anchorage in 10 fathoms, soft mud, with the reservoir Northward of the Iron Works (on the West side of Port FERRAJO Bay) in line with MONTE BELLO bearing 289°. There is also anchorage, in 8 to 9 fathoms, soft mud, with the Southern side of TORRE MARTELLO in line with the Northern edge of Forte INGLESSE, bearing 302°, and the Light Tower on Forte STELLA bearing 000°.

The holding ground is not good in either of these anchorages, and with strong South-Easterly winds vessels are liable to drag, even with two anchors down.

There is anchorage in LA FOSSA, in depths of 8 fathoms, with the Northern reservoir in

(10) **Transport Facilities**

Road and Railway

The main coastal road and railway pass through CROTONE

(11) **Signal Communications**

Except for a report of a D/F Station at CROTONE, there is no information.

(12) **Defences**

None have been reported.

FERRAJO, PORTO (ELBA)

(Lat. 42° 49' N., Long. 10° 20' E.)

(See Plans 28 and 28A)

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Anchorage

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The holding ground is not good in either of these anchorages, and with strong South-Easterly winds vessels are liable to drag, even with two anchors down.

There is anchorage in LA FOSSA, in depths of 8 fathoms, with the Northern reservoir in line with the South-Western extreme of Forte INGLESSE (Lat. 42° 49' N., Long. 10° 19' E.), bearing 325°, and the Mole at the head of LA DARSENA bearing 041°.

Conspicuous Objects

The white conical summit of Monte BELLO, near the Coast, about 1½ miles Westward of TORRE MARTELLO.

The ruins of Santa LUCIA, on a bare peak about 1½ miles South-West of Torre MARTELLO.

The Light Tower of Fort STELLA, on the Eastern point of Porto FERRAJO Promontory.

Winds

When the mountains around Port FERRAJO are covered with cloud, South-Easterly winds, which predominate in this area, are indicated, and will blow strong when the water level in the port rises, and remains above normal.

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(2) Port Facilities

Description of Harbour

The Harbour is open to the South, and is divided into (a) The Darsena, which opens South-Westward, and (b) SENO del PONTICELLO, South of which four Piers extend.

(a) LA DARSENA

The Darsena, the entrance to which is between P. del TORRIONE on the East and Molo SANITA, on the West, is a basin surrounded by North-Western and North-Eastern Quays, and a Mole, exclusively used for Naval purposes, at the Southern end of the Eastern side. The Basin is about 800 ft. long and 650 ft. wide, with an average depth of about 10 ft. at Quays, and from 16 to 18 ft. close off them.

Mole at head of Basin

Length 40 yards, depth alongside approximately 13 ft. Reserved for Mail Steamers.

North Western Quay

Length 200 yards, depth alongside 10-18 ft. Small vessels moor Stern-to this Quay.

North-Eastern Quay

Length 270 yards, depth alongside 10-12 ft. Sailing vessels moor close together for about 55 yards from the head of the Basin along the Quay.

Naval Mole

Length 70 yards, width 16 yards. This Mole is situated at the South-Eastern extremity of the East side of the DARSENA, off Tower Point.

(b) SENO di PONTICELLO

Pontile HENNIN, Northernmost Pier

Length 130 yards, depth alongside (outer part) 30 ft. This Pier is connected by a framework Bridge with the Iron Works which lie to the West of it.

Southernmost Pier

Length 200 yards, depth alongside (outer part) 20-23 ft.

Intermediate Piers

Between Pontile HENNIN and the Southernmost Pier, there are two small Piers, 40 yards apart, each extending about 75 ft., with a 12-ft. depth of water between them.

Mooring Buoys

There are Mooring Buoys in LA DARSENA, and on each side of Pontile HENNIN. There are two mooring buoys for the use of Naval vessels between Punta del TORRIONE and Punta LE GROTTA.

Cranage

Several cranes are available, the largest is of 10-ton capacity.

Harbour Craft

There are tugs and lighters, number not known.

Oil

There is a Pumping Station at the end of Molo SANITA behind which are the Oil Tanks.

Water

Water is supplied by Water-Boat.

Docks and Repair Facilities

There are two Patent Slips, each 197 ft. long. Small repairs can be effected.

(3) The Town

Length 200 yards, depth alongside 10-18 ft. Small vessels moor close together for about 55 yards from the head of the Basin along the Quay.

Naval Mole

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(3) The Town

The Town, which is surrounded by walls, stands on the Southern side of the Promontory, which is bounded by FORT FALCONE on the West, and Fort STELLA on the East.

Population

The population, 8,500 in 1930, is mostly registered Fascist, but there is a strong catholic Anti-Party element.

Provisions

While there are few stocks of food on the Island, fish is fairly plentiful.

Water

The water supply for Porto FERRAJO comes by underground aqueduct from Monte POGGIO, supplying the village of PROCCHIO on its way. In Porto FERRAJO there is a large cistern immediately West of Fort STELLA. All the water is distributed from this cistern. Outside the town, supply is dependent on wells, which are plentiful, but the water tastes most unpleasant.

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(4) **Government Establishments**
Barracks

Naval Barracks.—These are East of the Naval Mole, on the LINGUELLA. There is a large modern Barracks in the old LONGONE CITADEL.

Harbour Master's Office
This is on Molo SANITA.

(5) **Commercial Establishments**

ELBA is the most important Italian source of iron ore and in 1937 produced 60 per cent. of the total Italian output. The works of the ILVA Iron and Steel Company are situated immediately to the West of the Town. The ore from the RIO MARINE Mines is lightered to PORTO FERRAJO and unloaded by special transporters. There are five Blast Furnaces at the PORTO FERRAJO works and three more at PIOMBINO on the mainland opposite. The annual output of the six furnaces is about 500,000 tons of iron, which is approximately half of the total Italian output of pig iron. Interference with these furnaces would therefore have a serious effect on the Italian steel industry.

Oil Installation

There is a Naphtha Installation of several thousand tons capacity under the wall of the South-West bastion of Forte FALCONE. Owing to the peculiar angle of the bastion the installation is almost invisible from sea, land and air. One Tank has a capacity of at least 3,000 tons. Main pipes (12-in.) and secondary pipes run right round the Port.

Repair Shops

The Repair Shops at PORTO FERRAJO are ill-fitted and not up to date. Only small Tugs are refitted at the Port.

(7) **Air Facilities**

Seaplane Base

An unconfirmed report states that the Port is to be developed as a Seaplane Base and that facilities for Landplanes are also to be provided.

There is a Seaplane Alighting Station in the Bay West of Punta delle GROTTI. Aircraft are forbidden to fly over ELBA and the PIOMBINO Channel.

Aerodrome

An Aerodrome is reported to be under construction on PIANOSA Island—7 miles South of ELBA.

(10) **Transport Facilities**

Sea

There is regular steamer communication with Italian Mainland Ports.

Roads

A good road leads from the Town to a position West of the South-Western point of Porto FERRAJO Bay. Here the road forks, the Eastern arm going to Port LONGONE, and the Western to PROCCHIO and thence Southwards to CAMPO Bay.

A new Military Road has been constructed. This runs from a bend in the above main road, South-West of MAGAZZINI, 100 yards East of La VILLA, and joins it again East of point 228 (Monte CASTELLO) South of PROCCHIO.

There is a road along the Coast, from Porto FERRAJO to the battery position at Cape ENFOLA.

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There is a road along the Coast, from Porto FERRAJO to the battery position at Cape ENFOLA.

In general, the roads on the Island are macadamised and good. They are two-way and stand up well to Military traffic. They are fairly well graded; there is a steep and winding section near CAMPO el AJA, and a fairly steep hill near CAMPO dell COLLE.

Lateral communication is by track only.

Railways

There appears to be a light railway which connects the three Southernmost Piers of SENO dell PONTICELLO with the ILVA Ironworks, and continues down the Western side of the Gulf of Porto FERRAJO as far as the waste ground by C. S. PIETRO.

(11) Signal Communications

Semaphore at West end of the Island and W/T Station at PORTO FERRAJO are shown on Admiralty Chart No. 158 and Plan 28. Telegraph and/or power line to the semaphore goes over Mount MARCIANA. The W/T Station is fitted for R/T and is manned by naval ratings.

FERRAJO, PORTO 191

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

Battery.	Situation.	No. and Calibre of Guns.	Grading.	Date.
No. 1	Cape ENFOLA—(In tunnels in the hillside; two above, and three 30 ft. below, aimed in the CORSICA-CAPRAIA direction.	5—6 in. ..	Position A.2 No. and Calibre B.3	1940 or earlier.
No. 2	Cape PERO—(Lat. 42° 43' 20" N., Long. 10° 14' 00" E).	4—? 4-7 in. ..	B.2	1940 or earlier. 1938
No. 3	Cape SAN ANDREA ..	? 5 or 6—? 6 in. ..	No. and Position B.2	1938
No. 4	COLLE PECORINO—1 mile North-East of PROCCHIO the approach to the battery is from the main road.	?—? 6 in. ..	Calibre C.3 Position B.2 Calibre C.3	1938
No. 5	SCAGLIERI—about $\frac{1}{2}$ mile to the South-West.	?—? 6 in. ..	Position B.2 Calibre C.3	1938
No. 6	PUNTA della GROTTA—On the East side.	2—? 6 in. ..	No. and Position B.2 Calibre C.3	1938

(g) Magazines

There is an Arsenal, and a Powder Magazine 400 yards South-West of S. LUCIA (3 miles East of PROCCHIO), on the South-West of the valley; in sections in the side of the hill.

There is an underground Arsenal by the A.A. Battery on the Porto FERRAJO promontory.

(See (v) below.)

Observation Post

There is a look-out Post on the Island of PIANOSA.

(iv) Local Seaward Defences

Boom

The Harbour entrance is closed by a Boom which extends from TOWER Point to LE GROTTA Point with the gate at the Northern end.

(v) Local Air Defences

Anti-Aircraft Batteries

There are strong A.A. defences to the North and North-West of the ILVA Works.

There is a Battery of A.A. guns (one or two in number) on the East side of the Porto FERRAJO Promontory.

(13) Reconnaissance

Owing to its mountainous nature, the Island of ELBA is very difficult country for operations. Though not very high in most parts, the hills are rocky and covered with scrub. Possibilities of movement off the roads or tracks would, therefore, be very limited. There are very few trees. The lower slopes of the hills are usually terraced with vines.

On the South coast from Gulf of CAMPO to the Gulf of STELLA is a coastal plain of average width of $\frac{1}{2}$ mile. The Western and Southern shores of the Gulf of PORTO FERRAJO as far as LA CASA are also flat for about $\frac{1}{2}$ mile inland. The Eastern and Western parts of the Island are very hilly and broken country.

East of PROCCHIO the approach to the battery is from the main road.				1938	
No. 5	SCAGLIERI—about $\frac{1}{2}$ mile to the South-West.	2—? 6-in.	..	Position B.2 Calibre C.3	1938
No. 6	PUNTA della GROTTA—On the East side.	2—? 6-in.	..	No. and Position B.2 Calibre C.3	1938

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(v) Local Air Defences**Anti-Aircraft Batteries**

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A.F.V.s could only operate along the roads or in the plains mentioned above.

It is considered that the best approaches to the island would be by landings at the Gulfs of PROCCHIO, CAMPO or PORTO FERRAJO. The two former have excellent beaches of average width about 90–150 yards. They are sandy, while the Gulf of PORTO FERRAJO is stony. All three beaches are partly commanded by the Cape ENFOLA Battery. Tanks could not be landed direct on to any of these beaches; there is, however, a good quay at MARINE DI CAMPO. There is some cover, chiefly scrub and vines, at the back of all these beaches.

Field works would be possible on the plains. On the hills there is rarely more than 2 ft. of earth. Where vines grow there is certain to be at least $3\frac{1}{2}$ ft. of soil.

The only appreciable stream flows from near POGGIO to the sea at MARCIANA MARINE. It has a broad stony bed, about 300 ft. wide towards its mouth; except for occasional floods, it is, however, almost empty.

PIANOSA, unlike the other Islands of the TOSCANA Group, is almost flat. It might serve as a landing ground for aircraft. It is 7 miles from ELBA and could be brought under gunfire from that Island. It has no Garrison.

FIUME

(See Plan No. 53)

(1) General Remarks

FIUME which was formerly an important Austrian Port is now of secondary importance. It can handle a large amount of commercial traffic. Large vessels can hug the coast round the QUARNARO thus keeping inside territorial waters.

(2) Port Facilities

There are ample facilities for embarking and disembarking troops with considerable rail-connected Quayage for large ships though several Quays have no lifting appliances. There are 15 Cranes of about one ton capacity on the RIVA LUIGI RIZZO and three of two tons on the RIVA AMMIRAGLIO THAON DE REVEL. There is a Floating Dock to lift 4,500 tons moored in the basin adjoining this Yard. Only four tugs are available, of which only one (similar to the "West Dean" class) is of a reasonable size.

Dock

	Extreme Length	Width of Entrance	Depth on Blocks	Lifting Capacity
Floating Dock	309' 5"	65' 7"	22'	4,500 tons (can lift vessels of 6,500 tons register)

(3) The Town

See Plan No. 53.

(4) Government Establishments

Torpedo Factory

The "Silurificio di Fiume"—formerly Whitehead's, employs about 1,500 workmen, working in three shifts.

The factory is situated on the water-front East of the QUARNARO Yard. The works have been modernized and enlarged and are manufacturing the following types of torpedoes:—

- (a) 21-in. } Heater, driven by compressed air (200 Atm.), heated by paraffin.
- (b) 18-in. }
- (c) 18-in. Aerial Torpedo.

(a) Particulars of the 21-in. Torpedo

Length, 24 ft. 7 in.
Weight, 1 ton 5½ cwt.
Speed, 40 knots.
Range, 20 nautical miles.
Explosive charge, 440 lbs. Trinitrotoluol, 4.
Automatic depth and direction pilot.
Two propellers.

Firing at present has been done by percussion (trials have been carried out with both electric and magnetic firing).

(b) Particulars of the 18-in. Torpedo

Length, 16 ft. 6 in.

Dock

Floating Dock	Extreme Length	Width of Entrance	Depth on Blocks	Lifting Capacity
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 Automatic depth and direction pilot.
 Two propellers.

Firing at present has been done by percussion (trials have been carried out with both electric and magnetic firing).

(b) Particulars of the 18-in. Torpedo

Length, 16 ft. 6 in.
 Weight, 1 ton 2 cwt.
 Speed, 40 knots.
 Range, 8 nautical miles.
 Explosive charge, 330 lb. Trinitrotoluol, 4.
 Firing, etc., similar to the 21-in.

Particulars of the 18-in. Aerial Torpedo

Length, 13 ft. 6 in.
 Weight, 17 cwt. 40 lb.
 Speed, 35 knots.
 Range, 8 nautical miles.
 Explosive charge, 264 lb. Trinitrotoluol, 4.
 Launching: cannot be launched at a height exceeding 330 ft.

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The "SILURIFICIO di FIUME" sends Torpedoes to GERMANY via the BRENNER: the Torpedoes are sent without either explosive charge or percussion (firing mechanism) cap. A report states that Magnetic Mines are made here and that electrically propelled and exploded torpedoes are handled.

There is an Experimental Torpedo Firing Station equipped on the following lines:— There are two Under-Water Torpedo Tubes and two Above-Water Tubes, one of these is electrically controlled and the others worked by compressed air. There is an Observation and control Tower for trials.

Workshops include a Cleaning and Packing Section, a Main Assembly Section, a Foundry and Carpenter's Shop.

The experimental staff consists of three engineers and six mechanics.

(5) Commercial Establishments

"CANTIERI NAVALI DEL QUARNARO." This firm, which was formerly the Austrian shipyard of "DANUBIUS Co.," has six Building Shipyards. (See Section V (2).) The equipment of the Yard is mediocre and includes few machines of modern type.

The Armour Plate Workshop is now used for other purposes. There is a department for the repair and refit of State Railway engines, including boilers. The firm procures its steel from the TERNI STEEL WORKS. The Fitting-Out Basin is provided with an excellent Travelling Gantry, with a maximum lift of 100 tons. The Yard has its own Electric Power Station, and employs 1,200 men.

Torpedo Boats are constructed either at the CANTIERI NAVALI DEL QUARNARO or at the Torpedo Factory.

Petroleum Refinery and Tanks

The Refinery, owned by the A.G.I.P., is situated near the Petroleum Basin. It can be recognised from seaward by its two high chimneys with a tall Tower between them. The six Tanks shown South of the Railway Line on Plan No. 53 stand on higher ground than the Refinery and should be easily visible from ship's control or from the air. Capacity of Tanks is stated to be 116,500 cubic ft. each. The output per annum is 120,000 tons. The six Tanks North of the Railway Line appear to be approximately the same size.

Fuel Oil and Diesel Oil are available for ships on application, but quantities in stock are kept secret.

(6) Aircraft Factories

Nil.

(7) Air Facilities

Machines of the S.I.S.A. Line land and take off from the main Harbour. There is one buoy for mooring purposes West of MOLE SAN MARCO, where the machine is moored up for the night.

(9) Power Plants

These are shown on Plan No. 53. Mention should be made specially of the Electric light, Power Station and Water Works situated in the extreme North-East corner of Plan No. 53 on the River ENEO. This Station supplies Electric Light and Power along the whole RIVIERA, VOLOSICA, ABBAZIA and LAURANA.

(10) Transport Facilities

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(10) Transport Facilities

Air

FIUME is served by the S.I.S.A. line No. 3 which runs two services during the day—FIUME, ABBAZIA, BRIONI, VENEZIA and vice-versa.

The machines used on this Service are small Flying Boats of "CANT" type, fitted with one 500 h.p. Isotta Fraschini Engine. Carrying capacity is six passengers and mails.

(12) Defences

Two "pontoon," on each of which is a 5.9-in. gun, have been anchored at the end of the Breakwater for the protection of the Wharf and Torpedo Factory.

Batteries of two guns, each of 3.5-in. calibre, believed to be A.A., have been placed on MOLO LUNGO and also in immediate vicinity of SILURIFICIO di FIUME.

A.A. Sound Detectors have been installed near the town.

Details of Land Defences and Garrisons, especially on YUGOSLAV frontier, are required.

(C46758)

P

GAETA

(Lat. 41° 13' N., Long. 13° 34' E.)

(See Plans 11 and 12)

(1) General Remarks

GAETA Bay affords excellent shelter during Southerly, through West to Northerly winds. Moorings for Battleships are laid down opposite the coast between S. ANTONIO and MULINO points, together with an inner line of moorings for smaller ships up to 4,000 tons. In addition to these there are moorings for three Destroyers inside the breakwater.

It is reasonable to assume that GAETA could be rapidly constituted as an Advanced Naval Base.

(2) Port Facilities

Estimated Daily Capacity

300 d.w. tons stores, exclusive of M/T, of which for every 25 unloaded, the amount of Military Stores would be reduced by 100 tons.

(4) Government Establishments

Fuel Storage

There are three large concrete Tanks containing crude oil for ships' furnaces. These three Tanks have a total capacity of 50,000 tons.

(12) Defences

(i) *Sea Front Defences*(a) *Coast Defence Batteries* (See inset on Plan No. 11.)

It is believed that certain of the smaller guns (6-in. and 4.7-in.) were removed during the war 1914-18 and have not been replaced.

The following is a list of the Batteries:—

Battery No. 1. *SILVIO SAVIO*: Eight B.L. howitzers of 9.4-in. calibre; four B.L. guns of 6-in. calibre; (?) six B.L. guns of 6-in. calibre.

Battery No. 2. *PHILLIPSTHALL*: Two guns of (?) 4.7-in. calibre.

Battery No. 3. *CINQUE PIANI*: (?) guns of (?) calibre. It is possible that no guns are mounted.

Battery No. 4. *South of ORLANDO Tower*: (?) 12 guns of 4.7-in. or larger calibre. It is possible that no guns are mounted.

Battery No. 5. *North of ORLANDO Tower*: (?) six guns of 6-in. calibre. It is possible that no guns are mounted.

Battery No. 6. *Fort ORLANDO*: Five B.L. guns of 10-in. calibre; eight howitzers of 9.4-in. or 11-in. calibre. There may be other guns further West.

Battery No. 7. *STENDARDO Point* (1): (?) six Q.F. guns of (?) 2.2-in. calibre.

Battery No. 8. *STENDARDO Point* (2): Four guns of 6-in. calibre.

Battery No. 9. *S. ANTONIO Point*: (?) guns of (?) calibre.

(iv) *Local Seaward Defences**Booms and Net Defences*

An A/S Boom is in position.

(v) *Local Air Defences**Anti-Aircraft Batteries*

NO INFORMATION.

Magazines

(4) Government Establishments

Fuel Storage

There are three large concrete Tanks containing crude oil for ships' furnaces. These three Tanks have a total capacity of 50,000 tons.

(12) Defences

(i) *Sea Front Defences*

(a) *Coast Defence Batteries* (See inset on Plan No. 11.)

It is believed that certain of the smaller guns (6-in. and 4.7-in.) were removed during the war 1914-18 and have not been replaced.

The following is a list of the Batteries:—

Battery No. 1. SILVIO SAVIO: Eight B.L. howitzers of 9.4-in. calibre; four B.L. guns of 6-in. calibre; (?) six B.L. guns of 6-in. calibre.

Battery No. 2. PHILLIPSTHALL: Two guns of (?) 4.7-in. calibre.

Battery No. 3. CINQUE PIANI: (?) guns of (?) calibre. It is possible that no guns are mounted.

Battery No. 4. South of ORLANDO Tower: (?) 12 guns of 4.7-in. or larger calibre. It is possible that no guns are mounted.

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(iv) *Local Seaward Defences*

Booms and Net Defences

An A/S Boom is in position.

(v) *Local Air Defences*

Anti-Aircraft Batteries

NO INFORMATION.

Magazines

The Magazine, which is situated on the South-West side of Mount ORLANDO, is a white stone building with five gables and probably extends into the side of the hill. It is not visible from outside the walls, but its position is well marked by the conspicuous white church and monastery of Montagna SPACCATE. There are no lines of rails, nor visible means of ammunition supply.

Searchlights

There are three Searchlights with a dynamo near each. One of these is reported to be in No. 6 Fort ORLANDO and one near No. 8 Battery.

Naval Station

Warships are not permanently stationed at GAETA. The small Naval Repair Base there was reported to have been suppressed in 1921 in accordance with the post-war re-organisation scheme, but according to the latest information, dated 1924, it has been retained together with the DIFESA MARITTIMA.

GAETA
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Possible Objectives

Water Supply

Local supplies are practically negligible. A Tank in the Barracks of the DIFESA MARITTIMA has a capacity of 160 tons and is kept filled from NAPLES. Another 85-ton Tank supplies water to a hydrant on the Quays. Warships anchoring in the Bay are supplied by Tank Vessels drawing water from FORMIA.

Lighting

A High Tension Overhead Line, supplying three-phase alternating current at 3,500 volts from an inland mountain Hydro-Electric Generating Station, follows the coast Road to FORMIA, and is led to the transformers at the Electric Light Works in the Town. This line is carried on white porcelain insulators fixed to cross beams on creosoted posts about 30 ft. above the roadway.

Railways

GAETA is connected with NAPLES by rail. The Station is East of the Cemetery, North of the middle of the SERAPO Bay shore.

The line is a single track as far as SPARANISE, the junction on the main ROME-NAPLES line. It passes along the Eastern slopes of Mount COLLI and Mount TORTONE and thence round the West side of Mount TONDO and past the salient of the mountain road leading to Mount CONCA. About 400 yards from this point it crosses the APPIAN WAY by a Viaduct of 25 stone arches, the centre arch of which is from 50 to 60 ft. high. It then runs along the North side of the road to FORMIA.

There are two tunnels—one being to the North-East of Mount TOMBONE and the other between Mount TONDO and Mount TORTONE.

New lines are under construction to place GAETA in more direct communication by rail with NAPLES and ROME. The new line to NAPLES will keep parallel to the coast at a short distance from it.

GENOA

(Lat. 44° 23' N., Long. 8° 55' E.)

See Plans 13 and 14.

Reports marked * are of doubtful reliability.

(1) General Remarks

GENOA is one of the two greatest Italian Ports and competes with ANTWERP, ROTTERDAM and HAMBURG for the Central European Trade. It is an important shipbuilding, repairing and iron-smelting centre. The Port is purely Commercial.

(2) Port Facilities

The largest vessels can enter the Harbour, which has an area of about 1,005 enclosed acres (total area to Western limit at the POLCEVERA Torrent). Protection is afforded by five large Breakwaters. The width of the Eastern entrance is 820 ft. and that of the Western entrance 341 ft.; the width of the entrance to the Inner Harbour (from CALATA GADDA to PONTE PALEOCAPA) is 1,050 ft.

Inside the Harbour there are 20 large Jetties with Quays of a total length of 58,600 ft. and a total area of 405 acres; 130 vessels are able to tie up and load or unload direct with the Quayside.

Total length of Jetties and Breakwaters, 20,330 ft. Total length of external Jetties, viz., Molo Duca di GALLIERA and its Westward extension, Molo PRINCIPE UMBERTO, 15,274 ft. Length of Western Breakwater from the POLCEVERA Torrent to the entrance

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Considerable harbour improvements are still in progress in the XXVII OTTOBRE Basin, where five large Quays are being constructed as shown on Plan 14. Two of these quays are already complete (June, 1939) and a third nearly so. On the North-West side of this basin a special basin is to be constructed for oil traffic at a cost of about 5½ million lire, the purpose being reduction of fire risk in other parts of the Port.

Depth of water at entrances and alongside external jetties, 49 to 72 ft. Average depth of water in the Outer Harbour, 59 ft.; Inner Harbour, from 23 to 40 ft. Depth alongside the Quays varies from 23 ft. 6 in. to 36 ft. 1 in.

Estimated Daily Capacity

There is Berthing Accommodation (without use of specialized Berths) sufficient to handle 16,000 to 20,000 d.w. tons stores per day. In practice the Port may be regarded as having a capacity of 10,000 tons per day with a good margin of alternative berths should any be put out of action. These figures are exclusive of M.T. of which for every 100 vehicles unloaded the amount of Military Stores would be reduced by 400 tons.

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Docks

Docks.	Extreme Length.	Length at Top.	Width at Mean Springs.	Width at Top.	Depth at Mean H.W.	Depth on Blocks.
Dry Dock No. 1	571'	561'	81'	82' 8"	28' 6"	—
Dry Dock No. 2 (Can be divided into 2 or 3 Docks)	702'	?	60'	60' 7"	26'	—
Dry Dock No. 3	?	853'	105'	?	36'	—
Dry Dock No. 4	919' (Length may eventually be increased to 1,148')	?	135' 9"	?	?	42' 7"
Municipal Dock	280' 5"	—	Width at Entrance. 72' 2"	—	Depth at M.W.L. and on Blocks. 20'	

Lifting Appliances

There are 174 Electric or Hydraulic Cranes with lifting capacities varying from 10 to 1½ tons. There are also 43 electric coal hoists with a capacity of 4 to 5 tons.

Harbour Craft

The Harbour Craft includes 30 Tugs, some of which are sea-going, two Salvage Vessels and 2,000 Cargo Craft of various types with an aggregate tonnage of 100,000 tons.

(3) **The Town.** (See Plan 14.)(4) **Government Establishments**

The ISTITUTO IDROGRAPHICO, situated just North of the West Railway Station (see Plan 14). The Director of this establishment also acts as "Naval Commander" of the Port.

There is a Military Arsenal half a mile North of the Northern side of the Inner Harbour.

(5) **Commercial Establishments**

Ansaldo.—Further details concerning this firm are given in Section V (2). It owns the following establishments at or near GENOA:—

Shipbuilding and Repair Yard at SESTRI PONENTE.—The Western (or new) section undertakes construction of vessels of largest size. The Eastern (or old) section is chiefly used for smaller craft, such as Destroyers, and is entirely self-contained. There are in all seven Permanent Building Slips (984 ft., 820 ft., 656 ft., 492 ft., and three small) and 10 Temporary Slips. In the Eastern section is one of the largest equipments in the world for galvanising iron plates.

Shipbuilding Yard at CORNIGLIANO.—Two Building Slips (393 ft. and one small).

Fitting-Out Yards.—Situated in the East part of the Outer Harbour on the GUARDIANO Mole. Repairs to all types of vessels can be undertaken here and the Workshops are practically self-contained. Electricity for Power and Lighting are derived from the Town Supply at 12,000 volts, two 800-h.p. Converters being installed; but there is an independent 300-h.p. steam-driven Electric Generating Plant for use if necessary. Compressor plant of 400 h.p. supplies compressed air for automatic tools. There is one steam 60-ton Floating Crane, one

Depth at M.W.L.
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The new Fitting-Out Yard of Ansaldo is situated on the westernmost mole in the BENITO EACINO (see Plan 14). The Fitting-Out Quay is at the end of the mole, and situated on it is a large new shop supplied with crane facilities.

Repair Yard in GENOA Harbour, on the Molo VECCHIO, consists of shops for repairing hulls, machinery and boilers.

Ordinance, Boiler and Engine Works at SAMPIERDARENA. The boring lathes can take a 17.7-in. L/45 gun. Guns up to 15-in. have been manufactured. There is a shrinking pit 58 ft. deep and 150-ton Crane running on rails, 79 ft. above ground level. Boilers of all sizes can be manufactured. There is a 1,000-ton Hydraulic Press; bending rollers to take plates up to 14 ft. 7 in.; vertical riveter for barrels up to 150 tons; two 40-ton Cranes. Marine engines, reciprocating, turbine and internal combustion, are made up to all sizes. There are four heavy turning shops.

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Armour Plate and Gun Steel Works at CORNIGLIANO. One 90-ton Siemens Furnace, basic process, for production of armour; three electric furnaces for the production of steel, each of 27 tons capacity, which were installed about three years ago. There are also five Siemens Open-Hearth Furnaces of about 40 tons capacity.

Illa Steel Works.—The GENOA Branch of this large undertaking lies immediately at the East of the ANSALDO Yard at SESTRI PONENTE.

Delta Metal Works at CORNIGLIANO.—Situated near the steel works and produce torpedo tubes, turbine blades, segments for dynamo commutators, etc., of high standard.

Electrical Works at CORNIGLIANO.—Situated near the steel works and produce electrical apparatus of all sorts for war and merchant ships, including apparatus for the turrets of Italian Battleships.

Extensions to the main factory building on the South-East side are in hand and work on the roofing is progressing.

One gasometer has been built and the foundations of another have been laid. Part of a large building has been dismantled to enable the foundations of the second gasometer to be laid.

CORNIGLIANO. Extension to ANSALDO'S Works

Work is progressing in the area which has been reclaimed West of BACINO XXVIII OTTOBRE. The Eastern half of this area is now completely reclaimed and about 12 buildings have been erected. The lay-out and nature of these buildings—four of which appear to be blast furnaces—indicate that this site is an extension to ANSALDO'S ORDNANCE and ELECTRICAL Works and not an Aerodrome or Seaplane Station as previously reported.

A further 1½ miles of the foreshore at SESTRI PONENTE is also included in the scheme but work has not started.

Odero-Termi-Orlando have the following establishments:—

Shipbuilding and Engineering works at SESTRI PONENTE.—There are six Building Slips 500 ft. long, which appear to be derelict; nothing has been launched from them for five years. It is one of the principal establishments in ITALY for the construction of steam engines.

Repair Shops on the MOLO VECCHIO in the Harbour.

Cantieri del Tirreno.—*Fitting out Works* on the CALATA DELLE GRAZIE in the Harbour, Vessels of the largest size can come alongside.

Ente Bacini (Dry Docks Corporation).—Dry Dock No. 4, one of the only three in ITALY capable of accommodating the "LITTORIO" class Battleships, was completed and brought into use on June 17th, 1939, after taking over four years to build. It is situated on the outer side of the Molo GUARDIANO and has been built up in the sea as opposed to being excavated. The capacity is 260,000 cubic yards and the Dock can be emptied in 4½ hours by means of three powerful Electric Pumps. The use of shores has been eliminated, chocks only being required to support a ship's hull.

At the CALATA GRAZIE there are three Docks, details of which are given in para. (2) Port Facilities. There is also a small Dry Dock at the DARSENA, of dimensions 274 ft. by 72 ft. by 23 ft.

San Giorgio Optical Works.—These works are situated at SESTRI PONENTE, immediately to the East and slightly inland of the Odero-Termi-Orlando Shipyard.

The firm produces rangefinders, periscopes, fire control gear and other precision instruments, and also has large electrical and engineering sections.

Radio MARCONI Factory: situated in Via VARESE, 3.

Fuel Storage

Oil Fuel and Petrol.—There is a total estimated storage capacity of 75,250 tons as

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Fuel Storage

Oil Fuel and Petrol.—There is a total estimated storage capacity of 75,250 tons as follows:—

- (a) Fuel oil 62,000 tons.
- (b) Lubricating oil 13,000 tons.
- (c) Petrol 250 tons.

situated in the Dock area, lying to the West of the PORTO NUOVO. None of the tanks is protected by a blast wall; nor is any group of tanks completely surrounded by a fire wall, designed to prevent the total escape of oil flowing from damaged tanks.

The tanks are located as follows:—

(i) *CANZIO WHARF, on the West side of the VITTORIO EMANUELE HARBOUR*

- (a) Eight oil tanks, dazzle-painted; total estimated capacity 40,000 tons of fuel oil. These eight tanks are divided into two groups, each of four tanks, separated by a central pumping station. A tanker is moored close to the pumping station.
- (b) Eight small oil tanks, dazzle-painted; total estimated capacity 250 tons of petrol.

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(ii) *LUBRICATING OIL DEPÔT at the Eastern end of the CALATA MOLO NUOVO*
This Depôt is situated immediately North-East of the base of the CANZIO WHARF, and contains 26 dazzle-painted tanks, the total estimated capacity of which is 13,000 tons of lubricating oil.

A tanker is moored 250 yards to the West of this Depôt.

(iii) *North of the CALATA GIACCONE*

Three dazzle-painted tanks; estimated total capacity 10,000 tons of fuel oil.

(iv) *550 Yards West of ANSALDO'S ORDNANCE WORKS*

A floating roof tank, which was about 60 per cent. full in April, 1941; estimated capacity of tank 12,000 tons of fuel oil; estimated contents 7,200 tons.

Coal

Stocks are sufficient to meet all requirements and facilities include a Floating Coal Deposit with a capacity of 15,000 tons.

(6) *Aircraft Factories*

At SAN GIORGIO there is a branch factory of the SOCIETA ANONIMA PIAGGIO which manufactures components for the parent factory. 1,000 men are employed.

(7) *Air Facilities*

Seaplane Station

Situated on North side of Vittorio Emanuele III Basin, to the West of Capo di FARO, it belongs to a Civil Air Line, the Societa Anonima Navigazione, which has its Headquarters at GENOA. The Station occupies a frontage of 1,300 ft. between the two new jetties in the basin. There are two Hangars. The DUCA DEGLI ABRUZZI Basin appears also to be in use as a Seaplane Station.

Landing Ground

Small Landing Ground with North to South runway on the PONTE SOMALIA and East to West runway North of the CALATA TRIPOLI and the CALATA MOGADISCIO. A landing "T" is visible. This Landing Ground is in use; six planes have been sighted lined up in front of the hangars.

(8) *War Material Factories*

Military Arsenal

Situated about 500 yards North of the Main Railway Station (Plan No. 14). Stated in November, 1930, to be in course of complete demolition together with the large Military (S. BENIGNO) Barracks.

Ansaldo's are engaged in the production of shells.

(9) *Power Plants*

The new Steam Electric Power Station is situated close to the PONTE SAN GIORGIO and covers an area of 20,332.6 square yards.

At present it produces a power of 100,000 kw., but will eventually be capable of producing twice this amount.

The main lines carry 60,000 to 120,000 volts to the transformers for distribution.

This Station will eventually supply Power and Lighting for the Harbour Works and for a large part of the Town.

There is a Power Line to GENOA from VENTIMIGLIA, 83 miles inland. The course of the line is shown on Plan No. 14. Steam and Electric Power Station near the ANDREA DORIA Pier and Auxiliary Station near the MARINETTA supply the Hydraulic Installation of the

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Power Station in the CAVA CHIAPELLA supplies the Electric Installations serving the Western part of the Port.

Grain Installation situated on the S. LIMBANIA Quay, capacity 50,000 tons. There is a pneumatic plant for handling grain on the PARODI Pier, capacity 50 tons an hour.

Cold Stores at the wet dock, capacity 127,000 cubic ft. Military Cold Store near the General Warehouses (MARINETTA), capacity 2,400 tons of carcasses.

(10) **Transport Facilities**

Railways

GENOA is on the line from SPEZIA to the French Frontier at VENTIMIGLIA. The line has been doubled and electrified in certain sections, Power being supplied, it is believed, from the Central Electric Station in the CAVA CHIAPELLA at GENOA. It follows the general line of the coast from SPEZIA to VENTIMIGLIA and is open to bombardment at numerous points. Just West of ZOAGLI Station, 20 miles Eastward of GENOA, is an important Bridge.

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(11) Signal Communications

A V/S Station is situated South of and adjoining the FARO Lighthouse.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

Battery No.	Name, Location and Description.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	VOLTRI—Sited about 1 mile to the East-North-East, on the South slopes of Bric del VENTO in Lat. $44^{\circ} 25' 57''$ N., Long. $8^{\circ} 46' 15''$ E., in open emplacements, possibly H.A./L.A.	4—? calibre	A.2	—	1942
2	CASTELLUCCIO—Sited about 1,000 yards to the West of PEGLI on the South slopes of BRIC CABANNA.	4—6-in.	A.2	A.3	1942
3	PEGLI—Sited about $\frac{1}{2}$ mile North-North-East of PEGLI village on the South slopes of a hill in Lat. $44^{\circ} 26' 01''$ N., Long. $8^{\circ} 49' 32''$ E., 3 emplacements—2 occupied by medium guns.	2 (?) 3—6-in.	A.2	A.5	1942
4	PEGLI—Sited about 1 mile North-North-East of PEGLI in Lat. $44^{\circ} 26' 22''$ N., Long. $8^{\circ} 49' 39''$ E., 2 emplacements probably occupied by heavy guns.	2—? calibre (8-in. or above).	A.2	A.5	1942
5	MULTEDO—0.2 miles East of TORRENTE VARENNA, unoccupied emplacements for C.D. guns.	? guns—? calibre	A.2	—	1942
6	Monte CROCE Battery—4 emplacements look empty now (? camouflage), were occupied in 4.41.	? 4—? calibre	A.2	—	1942
7	ERSELLI Battery—On the South slopes of Mte. CROCE, 4 emplacements, 3 probably occupied by medium guns. All occupied in April 1941.	3 (?) 4—above 4.5-in. less than 8-in.	A.2	A.3	1942
8	Monte GUANO Battery—4 emplacements occupied in April 1941.	4—? calibre	A.2	—	1942
9	SAN MARTINO Battery, SAMPIER DARENA—Sited on South-West slopes of BELVEDERE Belfry Hill; 4 occupied emplacements probably medium guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
10	Ponte ERITREA—Sited at the South end, 6 emplacements, 4 of which are occupied by medium C.D. guns; in addition nearby 4 empty emplacements.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
11	LANTERNE Battery—Capo del FARO—near lighthouse, 2 emplacements which may be occupied.	? 2—? calibre	A.2	—	1942
12	FORT SAN BENIGNO, Capo del FARO—Sited on the edge of the cliff; 4 emplacements occupied by medium guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
13	Fort CROCETTA—4 emplacements probably occupied by medium C.D. guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
14	At junction of Molo PRINCIPE UMBERTO with Mola DUCA di GALLIERA—6 em-	6—? calibre	A.2	—	1942

1	VOLTRI—Sited about 1 mile to the East-North-East, on the South slopes of Bric del VENTO in Lat. 44° 25' 57" N., Long. 8° 46' 15" E., in open emplacements, possibly H.A./L.A.	4—? calibre	A.2	—	1942
2	CASTELLUCCIO—Sited about 1,000 yards to the West of PEGLI on the South slopes of BRIC CABANNA.	4—6-in.	A.2	A.3	1942
3	PEGLI—Sited about 1 mile North-North-East of PEGLI village on the South slopes of a hill in Lat. 44° 26' 01" N., Long. 8° 49' 32" E., 3 emplacements—2 occupied by medium guns.	2 (?) 3—6-in.	A.2	A.5	1942
4	PEGLI—Sited about 1 mile North-North-East of PEGLI in Lat. 44° 26' 22" N., Long. 8° 49' 39" E., 2 emplacements probably occupied by heavy guns.	2—? calibre (8-in. or above).	A.2	A.5	1942
5	MULTEO—0.2 miles East of TORRENTE VARENNA, unoccupied emplacements for C.D. guns.	? guns—? calibre	A.2	—	1942
6	Monte CROCE Battery—4 emplacements look empty now (? camouflage), were occupied in 4.41.	? 4—? calibre	A.2	—	1942
7	ERSELLI Battery—On the South slopes of Mte. CROCE, 4 emplacements, 3 probably occupied by medium guns. All occupied in April, 1941.	3 (?) 4—above 4.5-in. less than 8-in.	A.2	A.3	1942
8	Monte GUANO Battery—4 emplacements occupied in April, 1941.	4—? calibre	A.2	—	1942
9	SAN MARTINO Battery, SAMPIER DARENA—Sited on South-West slopes of BELVEDERE Belfry Hill; 4 occupied emplacements probably medium guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
10	Ponte ERITREA—Sited at the South end, 6 emplacements, 4 of which are occupied by medium C.D. guns; in addition nearby 4 empty emplacements.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
11	LANTERNE Battery—Capo del FARO—near lighthouse, 2 emplacements which may be occupied.	? 2—? calibre	A.2	—	1942
12	FORT SAN BENIGNO, Capo del FARO—Sited on the edge of the cliff; 4 emplacements occupied by medium guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
13	Fort CROCETTA—4 emplacements probably occupied by medium C.D. guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
14	At junction of Molo PRINCIPE UMBERTO with Mola DUCA di GALLIERA—6 emplacements, probably occupied C.D. guns.	6—? calibre	A.2	—	1942
15	West of and adjoining OLD LIGHT TOWER, 700 yards South-East of foot of Molo UMBERTO CAGNI—6 emplacements, probably occupied by 6 medium C.D. guns.	6—above 4.5-in. less than 8-in.	A.2	A.5	1942
16	Punta VAGNO—Sited 700 yards East of the point; 4 emplacements, probably occupied by medium guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
17	Fort San MARTINO—Sited on the South slopes of the hill, Lat. 44° 24' 09" N., Long. 8° 58' 11" E., 6 emplacements, 4 of which are occupied by medium C.D. guns.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942
18	Punta PRIARUGLIA—Sited 950 yards East of the point, Lat. 44° 23' 05" N., Long. 9° 00' 17" E., 4 guns, probably medium C.D. Battery.	4—above 4.5-in. less than 8-in.	A.2	A.5	1942

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(c) Machine Gun Posts

There are double Machine Gun Posts by the Military Hospital (see plan 13) and in Via Balbi (leading to the Main Railway Station, see plan 14). C.3. 1941.

(g) Magazines

There is a Magazine a quarter of a mile North of the Military Arsenal.

(iv) Local Seaward Defences

Minefields

Approaches mined.

Booms and A/S Net Defence

The Eastern entrance of the Port of GENOA is protected by two parallel Booms, 230 yards apart:—

(a) *Outer Boom*.—This extends from the South-West end of the Molo UMBERTO CAGNI to the end of the Molo DUCA di GALLIERA (not the Breakwater extension of it). A stretch of this Boom, 128 yards long, has been seen drawn back in a North-West direction to a buoy, making a gate through which a T.L.C. could pass.

(b) *Inner Boom*.—This extends from a point on the Molo DUCA di GALLIERA, 230 yards West of the junction of the Outer Boom with the Mole. It runs North-North-Eastwards from this point for 330 yards, then bends East-North-East for 95 yards and finally South-East for 67 yards. The total length is approximately 490 yards. The gate, when open and drawn back in an easterly direction to the same buoy as the Outer gate, is 157 yards wide. (A.2. 1942.)

(c) A Boom is in position between the Ponte C. COLOMBO and Ponte A. PARODI. (B.2. 1942.)

(d) A Boom, which opens at 6 a.m. and closes at 5 p.m. is placed between Ponte PIETRO PALEOCAPA and Calata GADDA. (C.2. 1942.)

(v) Local Air Defences

Anti-Aircraft Batteries

A.A. Battery No.	Name, Location, Description.	Armament.	Grading.	Date of Latest Report.
A.A.1	S. BARTOLOMEO—North-West of SESTRI PONENTE in Lat. 44° 25' 49" N., Long. 8° 50' 12" E. 2 emplacements which appear to be empty. (These may be for C.D. guns.)	? guns and calibre	A.2	1942
A.A.2	Monte CROCE—Sited near C.D. Battery No. 6. Light A.A. emplacements, may be occupied.	? No—2-in. or less	A.3	1942
A.A.3	ERSELLI—Sited near C.D. Battery No. 7. A number of possible light A.A. positions.	? No—2-in. or less	A.4	1942
A.A.4	Monte GUANO—Sited near C.D. Battery No. 8. Three emplacements occupied possibly by A.A.	3—? calibre	A.3	1942
A.A.5	BELVEDERE Belfrey, SAMPIERDARENA—Sited immediately East of C.D. Battery No. 9. Two emplacements, probably occupied by heavy A.A. guns.	2—3-in. or larger	A.3	1942
A.A.6	Ponte SOMALIA—Sited at the end of Ponte in Lat. 44° 24' 09" N., Long. 8° 53' 30" E. Two occupied emplacements, probably for heavy A.A. guns.	2—3-in. or larger	A.3	1942

back in a North-West direction to a buoy, making a gate through which ships could pass.

(b) *Inner Boom*.—This extends from a point on the Molo DUCA di GALLIERA, 230 yards West of the junction of the Outer Boom with the Mole. It runs North-North-Eastwards from this point for 330 yards, then bends East-North-East for 95 yards and finally South-East for 67 yards. The total length is approximately 490 yards. The gate, when open and drawn back in an easterly direction to the same buoy as the Outer gate, is 157 yards wide. (A.2. 1942.)

(c) A Boom is in position between the Ponte C. COLOMBO and Ponte A. PARODI. (B.2. 1942.)

(d) A Boom, which opens at 6 a.m. and closes at 5 p.m. is placed between Ponte PIETRO PALEOCAPA and Calata GADDA. (C.2. 1942.)

(v) *Local Air Defences*
Anti-Aircraft Batteries

A.A. Battery No.	Name, Location, Description.	Armament.	Grading.	Date of Latest Report.
A.A.1	S. BARTOLOMEO—North-West of SESTRI PONENTE in Lat. $44^{\circ}25'49''$ N., Long. $8^{\circ}50'12''$ E.; 2 emplacements which appear to be empty. (These may be for C.D. guns.)	? guns and calibre ..	A.2	1942
A.A.2	Monte CROCE—Sited near C.D. Battery No. 6. Light A.A. emplacements, may be occupied.	? No.—2-in. or less ..	A.3	1942
A.A.3	ERSELLI—Sited near C.D. Battery No. 7. A number of possible light A.A. positions.	? No.—2-in. or less ..	A.4	1942
A.A.4	Monte GUANO—Sited near C.D. Battery No. 8. Three emplacements occupied possibly by A.A.	3—? calibre ..	A.3	1942
A.A.5	BELVEDERE Belfrey, SAMPIERDARENA—Sited immediately East of C.D. Battery No. 9. Two emplacements, probably occupied by heavy A.A. guns.	2—3-in. or larger ..	A.3	1942
A.A.6	Ponte SOMALIA—Sited at the end of Ponte in Lat. $44^{\circ}24'09''$ N., Long. $8^{\circ}53'30''$ E. Two occupied emplacements, probably for heavy A.A. guns. Near Fort S. BENIGNO (C.D. Battery No. 12)—Sited on the edge of the cliff. Two occupied emplacements, possibly A.A.	2—3-in. or larger ..	A.3	1942
A.A.7	Ponte PIETRO PALEOCAPA—Lat. $44^{\circ}24'10''$ N., Long. $8^{\circ}55'06''$ E. Two emplacements, occupied by heavy A.A. guns.	2—? calibre ..	A.3	1942
A.A.8	CAMANDOLI Battery—Lat. $44^{\circ}24'43''$ N., Long. $8^{\circ}54'14''$ E. Four large emplacements, layout indicated heavy A.A. guns. A number of smaller emplacements may contain light searchlights or controls.	4—3-in. or larger ? No. of 2-in. or less ..	A.3	1942
A.A.10	PROMONTORIO Belfrey—Sited in an old fort, 340 yards East of the belfrey in Lat. $44^{\circ}25'06''$ N., Long. $8^{\circ}54'12''$ E. Four large emplacements, empty, and eight small emplacements which may be occupied by light A.A. guns.	? 8—2-in. or less ..	A.3	1942

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Anti-Aircraft Batteries—continued

A.A. Battery No.	Name, Location, Description.	Armament.	Grading.	Date of Latest Report.
A.A. 11	GRANAROLA—Sited in Lat. 44° 25' 27" N., Long. 8° 54' 38" E. Two circular emplacements which might be A.A., and 9? 10 occupied by very small guns (possibly A.A. machine guns).	2—? 3-in. or larger 9—2-in. or less	A.4	1942
A.A. 12	Punta GRANAROLO	4—? calibre	B.3	1940
A.A. 13	Fort BEGATO	2—4-in.	B.3	1940
A.A. 14	San SIMONE Battery—4-gun heavy A.A. battery.	4—3-in. or larger	A.2	1942
A.A. 15	Molo VECCHIO—Lat. 44° 24' 25" N., Long. 8° 55' 10" E. Two possible A.A. guns in open emplacements.	2—? calibre	A.4	1942
A.A. 16	Molo GIANO—Sited at the end of the mole in Lat. 44° 23' 56" N., Long. 8° 55' 32" E. Two emplacements probably occupied by heavy A.A. guns.	2—3-in. or larger	A.3	1942
A.A. 17	Molo UMBERTO CAGNI—Sited half way along the mole in Lat. 44° 23' 47" N., Long. 8° 55' 44" E. Two emplacements possibly occupied by heavy A.A. guns.	2—3-in. or larger	A.4	1942
A.A. 18	Molo UMBERTO CAGNI—Sited near the root of the mole in Lat. 44° 23' 54" N., Long. 8° 55' 52" E. Two emplacements possibly occupied by heavy A.A. guns.	2—3-in. or larger	A.4	1942
A.A. 19	Old LIGHT TOWER—Sited immediately in rear of C.D. Battery No. 15. Two emplacements, probably occupied by heavy A.A. guns.	2—3-in. or larger	A.3	1942
A.A. 20	Punta VAGNO	4—? 3 in.	A.2	1941
A.A. 21	Cta CIANDERLINO—Sited on hill 672, Lat. 44° 24' 56" N., Long. 8° 58' 20" E. (It is possible but improbable that these are C.D. guns.)	4—? 3-in. or larger	A.2	1942
A.A. 22	CHIAPPELO—Sited East of the Stadium at S. MARTINO, Lat. 44° 24' 25" N., Long. 8° 59' 05" E. Two emplacements (possibly more), probably occupied by A.A. guns.	2? more—? calibre	A.3	1942

Supplementary A.A. Defences and A.A. Close Defence

A.A. Machine Guns are mounted on the roofs of houses from Molo VECCHIO along the East side of the harbour as far as Corso AURELIO SAFFI and in and on buildings in the docks area.

There are rafts, armed with A.A. guns, moored in the harbour.

Unspecified A.A. batteries are reported to be manned by Germans.

A Radiolocation Station, also manned by Germans, has been reported: position not stated.

Twenty small guns, mounted on concrete emplacements, have been reported along the coast between QUINTO and NERV: these may be A.A. guns or C.D. guns.

Smoke Screen

On sounding of the alarm, a smoke screen covering the Harbour is reported to be released from the high ground round the Botanical Gardens, immediately North-West of Via BALBI, and from the Maritime Station. (1941. B.2).

A.A.17	8° 55' 34" E. Two emplacements probably occupied by heavy A.A. guns. Molo UMBERTO CAGNI—Sited half way along the mole in Lat. 44° 23' 47" N., Long. 8° 55' 44" E. Two emplacements possibly occupied by heavy A.A. guns.	2—3-in. or larger	A.4	1942
A.A.18	Molo UMBERTO CAGNI—Sited near the root of the mole in Lat. 44° 23' 54" N., Long. 8° 55' 52" E. Two emplacements possibly occupied by heavy A.A. guns.	2—3-in. or larger	A.4	1942
A.A.19	Old LIGHT TOWER—Sited immediately in rear of C.D. Battery No. 15. Two emplacements, probably occupied by heavy A.A. guns.	2—3-in. or larger	A.3	1942
A.A.20	Punta VAGNO	4—? 3 in.	A.2	1941
A.A.21	Cta CIANDERLINO—Sited on hill 672, Lat. 44° 24' 56" N., Long. 8° 58' 20" E. (It is possible but improbable that these are C.D. guns.)	4—? 3-in. or larger	A.2	1942
A.A.22	CHIAPPELO—Sited East of the Stadium at S. MARTINO, Lat. 44° 24' 25" N., Long. 8° 59' 05" E. Two emplacements (possibly more), probably occupied by A.A. guns.	2? more—? calibre	A.3	1942

Supplementary A.A. Defences and A.A. Close Defence

A.A. Machine Guns are mounted on the roofs of houses from Molo VECCHIO along the East side of the harbour as far as Corso AURELIO SAFFI and in and on buildings in the docks area.

There are rafts, armed with A.A. guns, moored in the harbour.

Unspecified A.A. batteries are reported to be manned by Germans.

A Radiolocation Station, also manned by Germans, has been reported: position not stated.

Twenty small guns, mounted on concrete emplacements, have been reported along the coast between QUINTO and NERVI: these may be A.A. guns or C.D. guns.

Smoke Screen

On sounding of the alarm, a smoke screen covering the Harbour is reported to be released from the high ground round the Botanical Gardens, immediately North-West of Via BALBI, and from the Maritime Station. (1941. B.2.)

Balloon Barrage

Balloons, flying at 7,000 ft., have been sited between the sea and 2 miles inland at TARRENTE POLCEVERA. They are probably at short stay and only flown when the alarm sounds.

Intermediate Defences

A belt of A.A. guns is reported along the coast from GENOA to LEGHORN.

Armoured Trains

There are armoured trains on the coastal railway, mounting an unspecified number of Coast Defence guns of unstated calibre; some have six 3-in. A.A. guns. (B.2.)

(vi) Land Defences:

- A. Fort BELLA TENSALIA: four guns of (?) calibre: 1940 or earlier: C.3.
- B. Fort RATTI. (?) guns of (?) calibre: 1940 or earlier: B.0.
- C. Fort RICHELIEU. (?) guns of (?) calibre: 1940 or earlier: B.0.
- D. Fort S. TECLA. (?) guns of (?) calibre: 1940 or earlier: B.0.

IMPERIA

(Lat. 43° 53' N., Long. 08° 02' E.)

(See Admiralty Chart 1402)

(1) General Remarks

IMPERIA, which consists of the two small harbours of Porto MAURIZIO and ONEGLIA, is situated on the Italian Riviera at the South-Westerly extremity of the Gulf of GENOA.

Anchorage

There is anchorage in depths of 7 fathoms, sand, good holding ground, on the line joining the head of the Southern mole at Porto MAURIZIO to the head of the Eastern mole at ONEGLIA, at a distance of 2½ cables from the former.

There is also anchorage in depths of 6 to 6½ fathoms, sand, good holding ground, 2½ cables Southward of the head of the Eastern mole at ONEGLIA.

These anchorages are unsafe in South-Westerly winds.

Conspicuous Objects

At Porto MAURIZIO there is a large yellow Cathedral with a conspicuous cupola and two bellfries with cupolas; equally conspicuous is the Monastery of Santa CHIARA, a building with a low row of arches, near the coast, about 1½ cables South-South-Westward of the Cathedral.

At ONEGLIA there are two bellfries, the Western and higher one being that of the Cathedral.

Tides and Currents

South-Easterly winds send in much sea and swell into Porto MAURIZIO; at ONEGLIA fresh Easterly winds cause a circular current in the harbour, which runs through the entrance in a North-Easterly direction, along the Eastern mole and thence Southward down the Western mole.

(2) Port Facilities

Description of the Harbours

(a) Porto MAURIZIO

The harbour is protected by two moles; the Northern is curved and the Southern extends 3½ cables South-South-Eastward. The entrance between the two moles is about half a cable wide and faces East-South-Eastward.

Depths of Water.—There are depths of 26 ft. at the entrance and of from 21 to 28 ft. in the harbour, except in the South-Western part where the depths are less than 18 ft.

Quays.—Calata PRINCIPE TOMASO extends along the Northern side of the harbour, has a total length of 1,000 ft., with depths of from 10 to 25 ft. alongside.

Vessels usually anchor and secure their sterns to the quay.

Water is laid on to the quay.

Mooring Buoys.—There are several mooring buoys in the harbour and at its entrance.

(b) ONEGLIA

The harbour is protected by two moles; the entrance faces South-Westward.

Depth of Water.—There are depths of 24 to 30 ft. in the entrance and of from 25 to 28 ft.

There is also anchorage in depths of 6 to 6½ fathoms, sand, good holding ground, 2½ cables Southward of the head of the Eastern mole at ONEGLIA.

These anchorages are unsafe in South-Westerly winds.

Conspicuous Objects

At Porto MAURIZIO there is a large yellow Cathedral with a conspicuous cupola and two belfries with cupolas; equally conspicuous is the Monastery of Santa CHIARA, a building with a low row of arches, near the coast, about 1½ cables South-South-Westward of the Cathedral.

At ONEGLIA there are two belfries, the Western and higher one being that of the Cathedral.

Tides and Currents

South-Easterly winds send in much sea and swell into Porto MAURIZIO: at ONEGLIA fresh Easterly winds cause a circular current in the harbour, which runs through the entrance in a North-Easterly direction, along the Eastern mole and thence Southward down the Western mole.

(2) Port Facilities

Description of the Harbours

(a) Porto MAURIZIO

The harbour is protected by two moles; the Northern is curved and the Southern extends 3½ cables South-South-Eastward. The entrance between the two moles is about half a cable wide and faces East-South-Eastward.

Depths of Water.—There are depths of 26 ft. at the entrance and of from 21 to 28 ft. in the harbour, except in the South-Western part where the depths are less than 18 ft.

Quays.—Calata PRINCIPE TOMASO extends along the Northern side of the harbour, has a total length of 1,000 ft., with depths of from 10 to 25 ft. alongside.

Vessels usually anchor and secure their sterns to the quay. Water is laid on to the quay.

Mooring Buoys.—There are several mooring buoys in the harbour and at its entrance.

(b) ONEGLIA

The harbour is protected by two moles: the entrance faces South-Westward.

Depth of Water.—There are depths of 24 to 30 ft. in the entrance and of from 25 to 28 ft. in the harbour.

Quays.—The Western mole is quayed for 400 ft. on its Eastern side. It is used principally for discharging coal and has depths of from 22 to 25 ft. alongside.

The Northern Quay, on via della MARINA, is 1,000 ft. long with depths of from 25 ft. at its Western end shoaling to 6 ft. at its Eastern end. The Western end is reserved for steam vessels: small vessels anchor in the Eastern side of the harbour. Water is laid on to the quay.

Mooring Buoys.—There are three mooring buoys in the harbour.

(3) The Town

The combined population of Porto MAURIZIO and of ONEGLIA is about 35,000. There are two hospitals, one in each town.

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(4) **Government Establishments**

To the North of Porto MAURIZIO there is a Naval Institute on which is surmounted, in a quadrangular tower, a meteorological observatory.

In ONEGLIA there is a large Penitentiary.

Oil Refineries

The SASSO (edible) Oil Refineries are at IMPERIA. It is possible that these may now be used for refining other kinds of oil.

(5) **Commercial Establishments**

A small stock of coal is maintained: small repairs can be effected.

(7) **Air Facilities**

Seaplane Alighting Areas

(a) *Porto MAURIZIO*.—The area reserved for seaplanes is bounded Southward by a line joining the light columns on the Northern and Southern moles; Westward and North-Westward by the Northern Mole and the coast as far as the mouth of the RIO BAITE, about half a mile North-Eastward; and Eastward by a line joining the river mouth and the light column on the Southern Mole.

(b) *ONEGLIA*.—The area reserved for seaplanes is bounded Southward by a line joining the light column on the Eastern Mole and the mouth of the RIO BAITE; Northward by a line joining the river mouth and the light column on the Western Mole; and Eastward by a line joining the light columns on the moles.

(10) **Transport Facilities**

Roads

Porto MAURIZIO and ONEGLIA are both on the main coast road which runs from GENOA along the RIVIERA to the French Frontier.

Another main road runs inland to the Northward to CEVA, which is a road junction for SAVONA to the East and MONDOVI and CUNEO to the West.

Rail

Both towns are on the Main Coastal Railway which runs from the French Frontier to SAVONA, GENOA, SPEZIA, LEGHORN and the South.

(12) **Defences**

No information has been received.

LAMPEDUSA ISLAND

(Latitude 35° 31' N., Longitude 12° 37' W.)

(See Plan 106 and Admiralty Chart 193.)

(1) **General Remarks**

LAMPEDUSA Island is situated South-South-East from PANTELLARIA Island and

(a) **Porto MAURIZIO**.—The area reserved for seaplanes is bounded Southward by a line joining the light columns on the Northern and Southern moles; Westward and Northward by the Northern Mole and the coast as far as the mouth of the RIO BAITE, about half a mile North-Eastward; and Eastward by a line joining the river mouth and the light column on the Southern Mole.

(b) **ONEGLIA**.—The area reserved for seaplanes is bounded Southwards by a line joining the light column on the Eastern Mole and the mouth of the RIO BAITE; Northward by a line joining the river mouth and the light column on the Western Mole; and Eastward by a line joining the light columns on the moles.

(10) Transport Facilities

Roads

Porto MAURIZIO and ONEGLIA are both on the main coast road which runs from GENOA along the RIVIERA to the French Frontier.

Another main road runs inland to the Northward to CEVA, which is a road junction for SAVONA to the East and MONDOVI and CUNEO to the West.

Rail

Both towns are on the Main Coastal Railway which runs from the French Frontier to SAVONA, GENOA, SPEZIA, LEGHORN and the South.

(12) Defences

No information has been received.

LAMPEDUSA ISLAND

(Latitude 35° 31' N., Longitude 12° 37' W.)

(See Plan 106 and Admiralty Chart 193.)

(1) General Remarks

LAMPEDUSA Island is situated South-South-East from PANTELLARIA Island and West by South from MALTA. It is sometimes used by enemy escort vessels and small steamers as a port of refuge.

(2) Port Facilities

A 1,000 ton coastal ship was sunk in June, 1941, inside the harbour in a position 2 cables from the entrance with her stern to the Eastern shore and her bows pointing 330°.

(4) Government Establishments

Fuel Storage

There is no reserve of Oil or Petrol.

Barracks

Small Barracks are situated in the Valley at position 087°, 12½ Cables from GUITGIA LT.

LAMPEDUSA ISLAND LIPARI ISLANDS

(7) Air Facilities

A Seaplane Station is under construction near the South-East point of LAMPEDUSA Island at a place called CALA FRANCESE. It is not known what progress has been made. There is an old Aerodrome 17° 4 Cables from GUITGLIA LT. which was used by the French in the War 1914-18; there are no signs of this Aerodrome being re-conditioned, but it could be brought into use.

(11) Signal Communication

There is a Semaphore 3½ miles North-West of LAMPEDUSA at a point known as Mt. ALBERO SOLE. A W/T station with two masts is reported East of MADONNA Pt., in position 35° 29' 47" N., 12° 35' 41" E.

(12) Defences

(i) Seafront Defences

(a) Coast Defence Batteries

	Date of Report.	Grading.
No. 1 Battery. PUNTA GRECALE, on the North coast near the lighthouse; Three guns of ? calibre.	Prior to 1941.	B.2.
No. 2 Battery. PUNTA CAVALLLO BIANCO MACAFERRI; Three guns of ? 5-in. calibre; One gun emplacement.	Number: 1941. Position confirmed: 1941.	A.1.
No. 3 Battery. SALINA Bay; Three positions for guns of ? calibre.		Positions: A.1. Guns E.D.: A.3. Emplacements: A.1. Guns E.D.: A.2.
No. 4 Battery. PUNTA GUITGLIA; Facing South-East; Two H.A./L.A. guns of ? calibre (light); One H.A./L.A. gun emplacement.	1941.	

(e) *Local Defence*.—There are trenches, with possible machine-gun emplacements, along the shore of CALA PISANA. (1941. E.D. A.3.)

Observation Post

There is an observation post in a high building at the East point of the North shore of CALA PISANA.

(iv) Local Seaward Defences

Listening Post

On the East side of the harbour there is a submarine listening post.

Boom

A boom, reported to be not torpedo proof, is anchored to two buoys and extends halfway across the entrance to the harbour from off the lighthouse on PUNTA CAVALLLO BIANCO.

(v) Local Air Defences

	Date of Report.	Grading.
PUNTA GUITGLIA, facing South-West, 50-60 yards West of E.D. Battery 4. Emplacement for one gun of ? calibre (light) (probably H.A./L.A.).	1941	Emplacement: A.1. Gun E.D.: A.2.

A.A. machine-guns are sited on both headlands at the entrance and others are disposed around LAMPEDUSA Harbour. (1941. B.2.)

Notes on Efficiency of A.A. Defences

In June, 1942.—"Intense flak from at least 20 light and heavy A.A. guns. Searchlights about 10 in action—effective."

(viii) Garrison

There are about 200 Artillerymen on the Island.

the North coast near the lighthouse:

- Three guns of ? calibre.
- No. 2 Battery. PUNTA CAVALLLO
BIANCO MACAFERRI: Three guns of
? 5-in. calibre: One gun emplacement.
- No. 3 Battery. SALINA Bay: Three
positions for guns of ? calibre.
- No. 4 Battery. PUNTA GUITGIA:
Facing South-East: Two H.A.L.A.
guns of ? calibre (light): One H.A.L.A.
gun emplacement.

(e) *Local Defence*.—There are trenches, with possible machine-gun emplacements, along the shore of CALA PISANA. (1941. E.D. A.3.)

Observation Post

There is an observation post in a high building at the East point of the North shore of CALA PISANA.

(iv) *Local Seaward Defences*

Listening Post

On the East side of the harbour there is a submarine listening post.

Boom

A boom, reported to be not torpedo proof, is anchored to two buoys and extends halfway across the entrance to the harbour from off the lighthouse on PUNTA CAVALLLO BIANCO.

(v) *Local Air Defences*

PUNTA GUITGIA, facing South-West, 50-60 yards
West of E.D. Battery 4. Emplacement for one gun
of ? calibre (light) (probably H.A.L.A.).

A.A. machine-guns are sited on both headlands at the entrance and others are disposed around LAMPEDUSA Harbour. (1941. B.2.)

Notes on Efficiency of A.A. Defences

In June, 1942.—"Intense flak from at least 20 light and heavy A.A. guns. Searchlights about 10 in action—effective."

(viii) *Garrison*

There are about 200 Artillerymen on the Island.

LIPARI ISLANDS

(Lat. 38° 30' N., Long. 14° 57' E.,

(See Admiralty Chart 172.)

(1) *General Remarks*

The Islands lie to the North-West of MILAZZO on the North coast of SICILY and are fertile and well cultivated. Isola LIPARI, the principal island of the group, is used by the Italians as a penal settlement and on the island Anti-Facists are interned. Goods, mostly wine, currants, capers, fish and pumice stone are exported to NAPLES and PALERMO.

LIPARI ISLANDS
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Other local products include oranges and olives.

The principal diet of the islanders consists of bread, pastry, vegetables, fruit, fish and very little meat; this suggests that they are partly self-supporting.

(11) Signal Communications

Cable

There is cable communication between LIPARI and SALINA and between LIPARI-PANAREA-STROMBOLI. The position of these cables is marked on Admiralty Chart 172. There is also cable communication with MILAZZO, in SICILY.

W/T

There is W/T communication between the islands, with SICILY, and the mainland. The positions of the stations are not known.

(12) Defences

Excavations were observed on commanding points in the LIPARI Group which appeared to be Defence Positions in course of preparation.

Coast Defence Batteries

No modern Defences have been reported.

A.A. Batteries

Believed to exist, no particulars.

LIVORNO (LEGHORN)

(Lat. 43° 33' N., Long. 10° 18' E.)

(See Plan 15.)

(1) General Remarks

The port is entirely artificial and consists of two inner harbours, PORTO MEDICEO and PORTO VITTORIO EMANUELE III, and an outer harbour, AVAMPORTO, all three protected by moles and breakwaters and lying in front of the town of LIVORNO, which is built on flat low-lying ground largely reclaimed in ancient times; in consequence, the town is a network of canals connected to the harbour, available for barges and lighters, and running under permanent stone bridges.

About 2½ miles off the shore and roughly parallel with it is a shoal of sand and mud, BANCHI (or SECCHIE) DELLA MELORIA. This shoal, just over 3 miles long, is marked at its Southern end by a tower, TORRE DELLA MELORIA, and a lighthouse, which are exactly 3 miles due West of the port; at its Northern end it was marked by a lightship. Between the Southern half of this shoal and the shore is LIVORNO Road with depths of 4 to 7 fathoms, sand and mud, in which anchorage may be obtained either for sheltering from Westerly gales or for awaiting entrance to the port.

The approaches to AVAMPORTO are either North or South of BANCHI DELLA MELORIA on courses 156° or 060°. The former leads over depths of 3½ fathoms, but on the Southern route depths of 6 fathoms are maintained until the breakwaters are reached.

(12) Defences

Excavations were observed on commanding points in the LIPARI Group which appeared to be Defence Positions in course of preparation.

Coast Defence Batteries

No modern Defences have been reported.

A.A. Batteries

Believed to exist, no particulars.

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(Lat. 43° 33' N., Long. 10° 18' E.)

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(1) General Remarks

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About 2½ miles off the shore and roughly parallel with it is a shoal of sand and mud, BANCHI (or SECHE) DELLA MELORIA. This shoal, just over 3 miles long, is marked at its Southern end by a tower, TORRE DELLA MELORIA, and a lighthouse, which are exactly 3 miles due West of the port; at its Northern end it was marked by a lightship. Between the Southern half of this shoal and the shore is LIVORNO Road with depths of 4 to 7 fathoms, sand and mud, in which anchorage may be obtained either for sheltering from Westerly gales or for awaiting entrance to the port.

The approaches to AVAMPORTO are either North or South of BANCHI DELLA MELORIA on courses 156° or 060°. The former leads over depths of 3½ fathoms, but on the Southern route depths of 6 fathoms are maintained until the breakwaters are reached.

The Northern entrance between DIGA MELORIA and DIGA MARZOCCO is about 350 yards wide, but the entrance, as defined by the four-fathom contours, is only 200 yards wide.

The Southern entrance between DIGA CURVILINEA and DIGA DELLA VEGLIAIA is over 600 yards wide, but the effective width as defined by the four-fathom contours is narrowed between DIGA CURVILINEA and SECCA PIANA to 240 yards.

Anchorage

For ships of less than 24 ft. draught nearly the whole of LIVORNO Road is available for anchoring on bottoms of sand, mud and weed, and a destroyer flotilla could easily be accommodated. There are a few depths in this area less than 4 fathoms, but these are easily avoided; deep-draught ships can anchor South of the line TORRE DE MARZOCCO bearing 065° and West of the line 162°/342° drawn through DIGA DELLA VEGLIAIA Light-house, where there is almost unlimited accommodation in depths of 6 to 16 fathoms, mud.

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This deep-water anchorage is exposed to Southerly and South-Westerly winds.

Three or four anchor berths (of 1 cable radius) are possible in PORTO VITTORIO EMANUELE III and in AVAMPORTO, 24 ft., mud, but ships in these berths would definitely obstruct traffic using the port.

Conspicuous Objects

TORRE DE MARZOCCO, a slender, white, hexagonal tower with a red roof, at the root of DIGA MARZOCCO.

The electric power station 400 yards East of TORRE DE MARZOCCO.

The high silo, surmounted by a clock tower, on PUNTA FRANCO.

The Dominican Convent with cupola, towards North of city.

The Cathedral belfry, reddish and quadrangular, in middle of city.

The Naval Academy South of city.

The high Lighthouse on SECCA PIANA.

The summit of MONTENERO, about three miles South-South-East of city.

Tides and Currents

Spring rise about 1½ ft.

Tidal streams negligible.

Currents are almost entirely dependent on the prevailing wind. In summer after persistent North-Westerly winds there is usually a strong South-going current between BANCHI DELLA MELORIA and the coast, and in AVAMPORTO. In winter the prevailing wind is North-East, which presumably causes little or no current.

Weather

Special Note on Winter Conditions.—*Wind and Sea.*—Fifty per cent. of the winter winds are North-East (vide *Mediterranean Pilot*, Vol. II, App. III).

Speaking generally, bad weather is rare and the chances of an on-shore wind of more than Force 3 are about 8 to 1 against.

Off-shore winds are at times fresh and are accompanied by much cloud and rain (or snow); they are squally, and flying conditions under the lee of the mountains are bad because of down currents. They raise a moderate sea about 5 miles off-shore.

Even during disturbed weather conditions Southerly winds seldom reach up the coast, but on occasions the swell produced by them will be felt right into the Gulf of Genoa.

Temperature.—Temperatures in December and January usually range between 37° and 57° F.

Cloud and Rain.—In December and January about 10 days each month are overcast with low cloud, and about eight cloudless or nearly so. Rain falls, sometimes very heavily, for about seven days each month.

Visibility.—Visibility in December and January is seldom bad near the coast, but may be on perhaps three days a month, though even then it seldom lasts more than 12 hours.

(2) Port Facilities

Description of Harbour

The harbour is protected from the sea by three main breakwaters: on the North by DIGA MARZOCCO, extending for 1,600 yards South-West from TORRE DE MARZOCCO.

The summit of MONTENERO, about three miles South-South-East of city.

Tides and Currents

Spring rise about 14 ft.

Tidal streams negligible.

Currents are almost entirely dependent on the prevailing wind. In summer after persistent North-Westerly winds there is usually a strong South-going current between BANCHI DELLA MELORIA and the coast, and in AVAMPORTO. In winter the prevailing wind is North-East, which presumably causes little or no current.

Weather

Special Note on Winter Conditions.—Wind and Sea.—Fifty per cent. of the winter winds are North-East (*vide Mediterranean Pilot, Vol. II, App. III*).

Speaking generally, bad weather is rare and the chances of an on-shore wind of more than Force 3 are about 8 to 1 against.

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Temperature.—Temperatures in December and January usually range between 37° and 57° F.

Cloud and Rain.—In December and January about 10 days each month are overcast with low cloud, and about eight cloudless or nearly so. Rain falls, sometimes very heavily, for about seven days each month.

Visibility.—Visibility in December and January is seldom bad near the coast, but may be on perhaps three days a month, though even then it seldom lasts more than 12 hours.

(2) Port Facilities

Description of Harbour

The harbour is protected from the sea by three main breakwaters: on the North by DIGA MARZOCCO, extending for 1,600 yards South-West from TORRE DE MARZOCCO; on the West by DIGA CURVILINEA, about 1,100 yards long and crescent-shaped, with an extension DIGA MELORIA, 800 yards long, running North-North-West; and on the South by DIGA DELLA VEGLIAIA, a detached breakwater 540 yards long running West to East, the Eastern end being about 600 yards clear of the shore and the intervening area being shoal ground. A reef, SECCA PIANA, and a small breakwater South of it and East of the Southern end of DIGA CURVILINEA also give protection from the South.

The Northern portion of the harbour is PORTO VITTORIO EMANUELE III and is contained by DIGA MELORIA, DIGA MARZOCCO, and DIGA RETTILINEA. The last-named mole is quayed on its South-East side. (The proposed scheme to quay the North-West side under the name of Brin Quay seems to have made no progress.) The ruling depths in PORTO VITTORIO EMANUELE III are about 25 ft., but the Eastern part, the site of the proposed Brin Quay, is shoal. It forms the entrance to ambitious new harbour works extending to the North-East, consisting of DARSENA PISA (reported to be shallow), DARSENA PETROLI with about 30 ft., BACINO MERIDIONALE and its North-North-East extension

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through the Eastern industrial zone, forming a dog-legged basin about 2,800 yards long by 100 yards wide. Immediately South of DARSENA PISA is a small boat camber enclosed by the first part of the retaining wall of the proposed Brin Quay.

Leading off to the North, between DARSENA PETROLI and BACINO MERIDIONALE, is DARSENA CIANO which forms the entrance to CANALE DEI NAVICELLI, connecting with PISA; this canal has recently been widened and is now 100 ft. wide, 9 ft. deep, and capable of taking 600-ton lighters. New Basin No. 1 is entered from the North-East corner of DARSENA CIANO. A small basin, unquayed, leads off on the East side just opposite the corner of the "dog-leg"; CANALE DELLE CATERATTE, connecting with the town canal system, leads into the middle of its South-Western side.

Immediately South of PORTO VITTORIO EMANUELE III are BACINO CAPPELLINI and its extension to the North-East, BACINO FIRENZE. These bacinos have a common entrance with PORTO MEDICEO and are quayed on both sides, CALATA ORLANDO and CALATA PISA on the North-Western side (these quays are on the South-Eastern side of DIGA RETTILINEA), and CALATA DEPOSITO FRANCO and CALATA CARRARA on the South-Eastern side. From the North-Eastern end of BACINO FIRENZE, CANALE DELLE INDUSTRIE, available for lighters without top-hammer, leads under three fixed bridges past the government petroleum stores and thence under a swing bridge to DARSENA CIANO.

The ruling depths in Bacinos CAPPELLINI and FIRENZE are about 26 ft.

DARSENA STAZIONE MARITTIMA, with depths of 10 to 14 ft., is entered from the North-Eastern corner of BACINO CAPPELLINI under a fixed bridge, the clear opening being about 20 ft. wide. It has CALATA MASSA and CALATA LUCCA on its North-West and South-East sides respectively. An opening South-West of CALATA LUCCA gives access to DARSENA VECCHIA and the canal system which wanders through the town.

AVAMPORTO is bounded by DIGA CURVILINEA on the West and by MOLO MEDICEO on the East. In the South-East corner is SECCA PIANA, a rocky ledge on which is erected the high lighthouse.

The ruling depths in AVAMPORTO are about 27 ft. and are found between DIGA CURVILINEA and a line drawn parallel to it 320 yards to the East. East of this it shoals towards MOLO MEDICEO, the 15 ft. contour lying roughly on the line joining SECCA PIANA with the northern end of MOLO MEDICEO.

There is a Seaplane Base in the South-East corner of AVAMPORTO, the slipway and hangars of which are on the South-Western side of MOLO MEDICEO.

PORTO MEDICEO (or PORTO VECCHIO) is entered from the North-Eastern corner of AVAMPORTO and has depths of 24 to 30 ft. in the entrance, which lies between the South-West end of DIGA RETTILINEA and the Northern end of MOLO MEDICEO. PORTO MEDICEO is bounded on the West by MOLO MEDICEO, the South-Eastern quay of which is named CALATA LA BASSA; on the South by CALATA DOGANA (Customs Wharf or ANCORE; on the East by CALATA ELBA and CALATA DOGANA (Customs Wharf or ANELLI Quay). A short Mole extends for about 160 ft. from the South end of CALATA DOGANA separating it from CALATA ELBA. The Captain of the Port's Offices lie to the North of CALATA DOGANA. PORTO MEDICEO is bounded on the North-East by CALATA SGARALLINO, which is the South side of PUNTA FRANCO, on which stands the conspicuous silo mentioned under "Conspicuous Objects" above.

The ruling depths in PORTO MEDICEO are 25 ft., the Southern end being slightly shoaler than the Northern.

DARSENA VECCHIA (Old Dock) is entered from the North-Eastern corner of PORTO MEDICEO between FORTEZZA VECCHIA, at the Eastern end of CALATA SGARALLINO (in the South-Western turret of which Fort Nelson resided) and the Captain of the Port's Offices. It extends in a North-to-South direction, is about 100 yards broad, and is divided

the South-Eastern side. From the North-Eastern end of BACINO FIRENZE, CANALE DELLE INDUSTRIE, available for lighters without top-hamper, leads under three fixed bridges past the government petroleum stores and thence under a swing bridge to DARSENA CIANO.

The ruling depths in Bacinos CAPPELLINI and FIRENZE are about 26 ft.

DARSENA STAZIONE MARITTIMA, with depths of 10 to 14 ft., is entered from the North-Eastern corner of BACINO CAPPELLINI under a fixed bridge, the clear opening being about 20 ft. wide. It has CALATA MASSA and CALATA LUCCA on its North-West and South-East sides respectively. An opening South-West of CALATA LUCCA gives access to DARSENA VECCHIA and the canal system which wanders through the town.

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The ruling depths in AVAMPORTO are about 27 ft. and are found between DIGA CURVILINEA and a line drawn parallel to it 320 yards to the East. East of this it shoals towards MOLO MEDICEO, the 15 ft. contour lying roughly on the line joining SECCA PIANA with the northern end of MOLO MEDICEO.

There is a Seaplane Base in the South-East corner of AVAMPORTO, the slipway and hangars of which are on the South-Western side of MOLO MEDICEO.

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The ruling depths in PORTO MEDICEO are 25 ft., the Southern end being slightly shoaler than the Northern.

DARSENA VECCHIA (Old Dock) is entered from the North-Eastern corner of PORTO MEDICEO between FORTEZZA VECCHIA, at the Eastern end of CALATA SGARALLINO (in the South-Western turret of which fort Nelson resided) and the Captain of the Port's Offices. It extends in a North-to-South direction, is about 100 yards broad, and is divided roughly in two by short moles which extend from either side, leaving an opening about 100 ft. wide between their ends. The quays or landing-places on the East side are named SCALI FASCELLI and SCALO MICHELI.

The ruling depths in DARSENA VECCHIA are 15 ft., but it is doubtful whether a depth of more than 12 ft. can be carried through the entrance.

On the North side of DARSENA VECCHIA is FORTEZZA VECCHIA (already mentioned), close East of which is the Canal FOSCO DELLA FOCE connecting DARSENA VECCHIA with DARSENA STAZIONE MARITTIMA. An offshoot from this canal branches inland and after circling the old part of the city returns to the South end of PORTO MEDICEO by way of DARSENA NUOVA. The Quay on the South-East side of FOSCO DELLA FOCE is named SCALO REGIO. On the South-Eastern side of DARSENA VECCHIA is the famous statue I Quattro Mori standing in the PIAZZA MICHELI. FOSCO DEI FRANCESI, a boat-passage in the South end of DARSENA VECCHIA, leads under a fixed bridge, PONTE NUOVO, into DARSENA NUOVA.

DARSEN A NUOVA is entered through a swing bridge in the South-East corner of PORTO MEDICEO. It is an irregular-shaped basin given over almost entirely to the Orlando Bros.' shipbuilding yard, and has depths of 20 to 24 ft. A patent slip and a dry dock occupy the Northern side, and three building slips the South-Eastern end; to the West of these latter slips is a fitting-out quay. West of the swing bridge is waste ground, which used to contain more building slips, now being dredged.

The South-West part of DARSEN A NUOVA is shut off by a pontoon bridge and appears to be shoal; it connects by boat-passages with the South-Western corner of PORTO MEDICEO. There is a large tobacco store between this part of the Darsena and PORTO MEDICEO.

The largest building slips of Orlando Bros.' Shipbuilding Yard are outside AVAMPOR TO proper, the launching basin being enclosed on the North by SECCA PIANA and on the South by a narrow dog-legged breakwater extending for about 350 yards from the South-Western corner of the Shipbuilding Yard. The entrance to this launching basin lies about 160 yards South of the high lighthouse and is about 75 yards broad. It is closed by a boom defence net.

South of the Orlando Shipbuilding Yard are public gardens with a sea-wall about 12 ft. high surmounted by a 3 ft. high parapet. This wall extends to the Southward in the form of a slight crescent for about 550 yards, extending from the middle of the wall for about 400 ft. is a pier on which are some buildings, including a bathing establishment, charted as BAGNI REGINA. This pier forms the North side of a small boat-harbour, PORTICCIOL O NAZARIO SAURO, the South side of which is enclosed by an L-shaped breakwater. The entrance between this breakwater and the BAGNI REGINA Pier is about 50 ft. wide. The depths in the boat-harbour are charted as 8 and 9 ft., but the depth in the entrance is only 5 ft. Apart from the boat-harbour the depths in front of the public gardens are very shoal and vary between 1 and 3 ft. The 6 ft. contour lies about 250 yards from the sea-wall and outside the entrance to the boat-harbour.

At the South end of the wall mentioned above (and immediately opposite DIGA DELLA VEGLIAIA) the coast turns Westwards, still bounded by the sea-wall, for 240 yards to PUNTA CAVALLEGGIERI. In the corner thus formed is another bathing establishment, BAGNI TROTTA, which has a pier leading up to the public gardens. The coast then turns South-South-East for 400 yards before turning Eastwards again for 100 yards back to its original frontage; the broad-fronted headland so formed is called SPIANATA DEI CAVALLEGGIERI. It is fronted by a rocky ledge and surrounded for nearly the whole of its length by a sea-wall.

From SPIANATA DEI CAVALLEGGIERI the coast, still surmounted by a sea-wall 6 to 8 ft. high, trends South-South-East for about 360 yards. There are two bathing establishments off this section, BAGNI PANCALDI and BAGNI PALMIERI (ACQUAVIVA). The water-space between SPIANATA DEI CAVALLEGGIERI and BAGNI PANCALDI forms a small camber with an entrance about 50 yards wide; this entrance seems clear of rocks but the inside appears to be foul.

Between BAGNI PANCALDI and BAGNI PALMIERI (ACQUAVIVA) is a rectangular walled enclosure which is a children's paddling-pool and sand-pit. The bathing establishments appear to be fronted by rocks.

The coast then turns South-East for 170 yards to PIAZZA SAN JACOPO, immediately South of which is the Naval Academy built on a rocky headland. There is a serpentine boat camber on the North-West side of the Academy and another small boat camber about 400 yards South of it. The entrance to the Northern camber is about 40 ft. wide, but the entrance to the Southern one is blocked by a large pillar, leaving a 25-ft. wide channel either side of it. There appears to be deepish water in both these cambers and the approaches to them also appear to be clean.

by a boom defence net.

South of the Orlando Shipbuilding Yard are public gardens with a sea-wall about 12 ft. high surmounted by a 3 ft. high parapet. This wall extends to the Southward in the form of a slight crescent for about 550 yards; extending from the middle of the wall for about 400 ft. is a pier on which are some buildings, including a bathing establishment, charted as BAGNI REGINA. This pier forms the North side of a small boat-harbour, PORTICCILO NAZARIO SAURO, the South side of which is enclosed by an L-shaped breakwater. The entrance between this breakwater and the BAGNI REGINA Pier is about 50 ft. wide. The depths in the boat-harbour are charted as 8 and 9 ft., but the depth in the entrance is only 5 ft. Apart from the boat-harbour the depths in front of the public gardens are very shoal and vary between 1 and 3 ft. The 6 ft. contour lies about 250 yards from the sea-wall and outside the entrance to the boat-harbour.

At the South end of the wall mentioned above (and immediately opposite DIGA DELLA VEGLIATA) the coast turns Westwards, still bounded by the sea-wall, for 240 yards to PUNTA CAVALLEGERI. In the corner thus formed is another bathing establishment, BAGNI TROTTA, which has a pier leading up to the public gardens. The coast then turns South-South-East for 400 yards before turning Eastwards again for 100 yards back to its original frontage; the broad-fronted headland so formed is called SPIANATA DEI CAVALLEGERI. It is fronted by a rocky ledge and surrounded for nearly the whole of its length by a sea-wall.

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Between BAGNI PANCALDI and BAGNI PALMIERI (ACQUAVIVA) is a rectangular walled enclosure which is a children's paddling-pool and sand-pit. The bathing establishments appear to be fronted by rocks.

The coast then turns South-East for 170 yards to PIAZZA SAN JACOPO, immediately South of which is the Naval Academy built on a rocky headland. There is a serpentine boat camber on the North-West side of the Academy and another small boat camber about 400 yards South of it. The entrance to the Northern camber is about 40 ft. wide, but the entrance to the Southern one is blocked by a large pillar, leaving a 25-ft. wide channel either side of it. There appears to be deepish water in both these cambers and the approaches to them also appear to be clean.

Mooring Buoys

The latest photographs show four mooring buoys moored within 200 yards of DIGA CURVILINEA, one off the entrance to PORTO MEDICEO and one (as charted) off the Captain of the Port's offices.

Accommodation

Four cruisers
Eight destroyers
Twenty large ships at quays
In addition several smaller ships.

} In AVAMPORTO, moored stern to DIGA CURVILINEA.

Method of Discharge

By ships' appliances into lighters from ships in AVAMPORTO
By ships' appliances and cranes into lorries and trucks from ships alongside.

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Trade

Chief imports: coal, fuel oil and motor spirit, phosphates, wood, cereals, kaolin, metals (especially copper), cellulose, skins, lubricating oil, cotton, etc.

Chief exports: marble, alabaster, granite, cement, tiles, wines, olive oil, maize, flour, woollen goods, hides and skins, glass.

In 1938, 3,895 vessels entered the port, totalling 4,085,000 tons.

1,476,000 tons of goods entered.

515,000 tons of goods cleared.

(Note.—In 1934 goods entered included 1,000,000 tons of coal and 100,000 tons of fuel oil.)

Essential Civil Traffic

Negligible.

*Estimated Daily Capacity**Alongside**

		Tons.
Darsena Ciano ..	1 at 350 tons ..	350
New Basin No. 1 ..	4 at 350 and 1 at 500 tons ..	1,900
Bacino Meridionale ..	2 at 350 tons ..	700
Calata Orlando ..	2 at 500 and 1 at 350 tons ..	1,350
Calata Deposito Franco ..	1 at 350 tons ..	350
Calata Carrara ..	3 at 350 tons ..	1,050
Calata Dogana ..	1 at 350 tons ..	350
		6,050
	Ships in AVAMPORTO and small ships in PORTO MEDICEO	2,000

By Lighter—

(Say) 8,000 tons daily.

* Ships lying at coal quay, Calata Pisa, not included.

Since the quays of the new dock system, BACINO MERIDIONALE and its North-Easterly extension, are not fully developed, and also since the peace-time daily clearance did not exceed 4,000 tons, it is unlikely that a daily rate of more than 6,000 tons could be exceeded. This figure is exclusive of M/T, of which for every 100 vehicles unloaded, the amount of Military Stores would be reduced by 400 tons.

Harbour Craft

- 1 large tug (seen November, 1941).
- 20 small tugs (5 reported to be equipped for salvage).
- 3 water boats.
- (1 naphtha barge, in 1937.)
- 250 lighters.
- Many pulling boats and small fishing-craft.

Landing of Men and Stores by Water Transport

Men.—Usual landing-place for men is at the landing-steps on the East side of PORTO MEDICEO.

There are also steps at the Captain of the Port's offices, and in DARSENA VECCHIA, including SCALO MICHELI, and at the head of MOLO MEDICEO.

Several of the quays have landing-steps, and there are also several landing-places for boats in the town canals.

Stores.—If all big-ship berths were occupied, stores could be landed in DARSENA STAZIONE MARITTIMA and in DARSENA VECCHIA; and, if the quay was clear, at

Darsena Ciano ..	1 at 350 tons ..	350
New Basin No. 1 ..	4 at 350 and 1 at 500 tons ..	1,900
Bacino Meridionale ..	2 at 350 tons ..	700
Calata Orlando ..	2 at 500 and 1 at 350 tons ..	1,350
Calata Deposito Franco ..	1 at 350 tons ..	350
Calata Carrara ..	3 at 350 tons ..	1,050
Calata Dogana ..	1 at 350 tons ..	350
		6,050

By Lighter—

Ships in AVAMPORTO and small ships in PORTO MEDICEO 2,000

(Say) 8,000 tons daily.

* Ships lying at coal quay, Calata Pisa, not included.

Since the quays of the new dock system, BACINO MERIDIONALE and its North-Easterly extension, are not fully developed, and also since the peace-time daily clearance did not exceed 4,000 tons, it is unlikely that a daily rate of more than 6,000 tons could be exceeded. This figure is exclusive of M/T, of which for every 100 vehicles unloaded, the amount of Military Stores would be reduced by 400 tons.

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Several of the quays have landing-steps, and there are also several landing-places for boats in the town canals.

Stores.—If all big-ship berths were occupied, stores could be landed in DARSENA STAZIONE MARITTIMA and in DARSENA VECCHIA; and, if the quay was clear, at CALATA DOGANA; at all of these cranes are available.

The maximum distance involved is 1,600 yards.

Landing Facilities outside Port Area

North.—From the South part of MARINA DI PISA to IL CALAMBRONE, a small river 4½ miles to the South, the coast is low and wooded and is fronted by a shelving sandy beach. A new and wide road runs behind the beach and is never more than 400 yards from it. As stated in paragraph (10) Transport Facilities, this road crosses IL CALAMBRONE about 400 yards from its mouth and then turns east. From 3,100 yards to 1,200 yards North of IL CALAMBRONE there are several large bathing establishments for poor children. The 1:60 is sandy and the average gradient (at the time of the most recent survey) varied between beach and 1:140. The beach is backed by low dunes about 6 ft. high. There are several stone groynes to prevent beach erosion in front of the bathing establishments, but elsewhere the beach is clear. The seaward approaches North of BANCHI DELLA MELORIA are also clear.

(C46758)

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Quayage, Cranage and Clearance From Quays

Name.	Length (feet).	Width (feet).	Height (feet).	Depth (feet).	No. of berths.	Cranes.			Rail, road and discharge facilities.
						No.	Capacity.	Type.	
PORTO VITTORIO EMANUELE III									
Diga Meloria ..	2,250	48	About 8	27 at 100 ft. off; about 12 alongside.	—	—	—	—	None
Diga Marzocco ..	3,600	15 25 (Southern 300 ft.)	About 10	15 to 9	—	—	—	—	None
Diga Rettilinea : North-West side	1,750	25	About 8	About 5	—	—	—	—	No facilities for unloading, but a railway line runs 25 ft. behind wall with a road between it and wall.
DARSENA PETROLI									
West Pier ..	700	15	About 8	24—30 (East) (?) 12 (West)	One	—	—	—	Oil pipe-line along pier and projection. Path along pier.
East Quay ..	450	5	About 8	24—30	One	—	—	—	Oil pipe-line along quay and projection. Path along quay.
East Pier ..	250	15							
Quay immediately East of above ..	520	—	About 8	24—30	One	—	—	—	

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Quayage, Cranage and Clearance From Quays

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LIVORNO

Height (feet).	Depth (feet).	No. of berths.	Cranes.			Rail, road and discharge facilities.	Remarks.
			No.	Capacity.	Type.		
About 8	27 at 100 ft. off; about 12 alongside.	—	—	—	—	None	There appear to be no bollards for stern moorings. Doubtful whether craft of more than 6 ft. can go alongside. Outside of breakwater appears to be cleaner than the usual detached breakwater, but doubtful whether any craft could go alongside. Boom defence secured 620 ft. South of North end.
About 10	15 to 9	—	—	—	—	None	Impossible to say whether ships could berth alongside, but since diga is not quayed it would appear unlikely. Photographs indicate that the boulders usually associated with unquayed breakwaters, if they do exist, do not protrude very far. Surface appears moderately smooth. Exit would be into S.I.A.P. oil installation.
About 8	About 5	—	—	—	—	No facilities for unloading, but a railway line runs 25 ft. behind wall with a road between it and wall.	This wall is not quayed and only boats and light craft could come alongside. Chart shows loose boulders alongside, but these cannot be seen on photographs. The South-West end of diga is rounded and appears to have landing steps.
About 8	24—30 (East) (?) 12 (West)	One	—	—	—	Oil pipe-line along pier and projection. Path along pier.	A short projection 75 ft. long, 15 ft. wide, at right angles to the pier, exists on North side 500 ft. from outer end.
About 8	24—30	One	—	—	—	Oil pipe-line along quay and projection. Path along quay.	Short projection 75 ft. long, 15 ft. wide, on South side 200 ft. from outer end.
About 8	24—30	One	—	—	—	—	Waste ground behind quay.

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(C46758)	Basin South-East of Torre de Marzocco:										
	North	400	—	About 8	Not known	—	—	—	—	—	
	South	1,750	—	About 8	Not known	—	—	—	—	—	Good road 60 ft. behind wall. This road continues along to North-East, crossing Canale delle Industrie by a swing bridge.
	DARSENA CIANO North-East side ..	660	About 30	About 8	About 20	One	—	—	—	—	Railway line along quay with road behind, both connecting with factory for tarring railway sleepers, and thence with LIVORNO.
	NEW BASIN No. 1 West Quay ..	1,300	About 75	About 8	About 24	2	5 (or 6)	(?)	(?)	—	Double rail track on quayside. Road behind.
	North Quay ..	710	About 37	About 8	About 20	One	—	—	—	—	Road on quayside. Double rail track behind.
	East Quay ..	875	About 175	About 8	About 20	One	One	(?)	Travelling electric (transporter)	—	Treble rail track on quayside, single track at back of quay.
	South-East Quay	775	About 170	About 8	About 24	One	—	—	—	—	Double rail track on quayside, single track at back of quay. In New Basin No. 1 ships discharge into trucks or lorries, using cranes and ships' appliances. Both road and rail go to LIVORNO round North end of docks.

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	About 8	Not known	—	—	—	—	—	Retaining wall alongside which ships might lie. Continuation to North-East as far as DARSENA CIANO appears to be a bank.
	About 8	Not known	—	—	—	—	Good road 60 ft. behind wall. This road continues along to North-East, crossing Canale delle Industrie by a swing bridge.	Retaining wall alongside which ships might lie.
30	About 8	About 20	One	—	—	—	Railway line along quay with road behind, both connecting with factory for tarring railway sleepers, and thence with LIVORNO.	Depth alongside uncertain; ships of 220 ft. have been seen alongside Eastern end.
75	About 8	About 24	2	5 (or 6)	(?)	(?)	Double rail track on quayside. Road behind.	Depth alongside uncertain. Ships of 430 ft. have been seen alongside.
37	About 8	About 20	One	—	—	—	Road on quayside. Double rail track behind.	Depth alongside uncertain.
175	About 8	About 20	One	One	(?)	Travelling electric (transporter)	Treble rail track on quayside, single track at back of quay.	Depth alongside uncertain. A naval hull (type uncertain) is fitting out alongside (November, 1941).
170	About 8	About 24	One	—	—	—	Double rail track on quayside, single track at back of quay. In New Basin No. 1 ships discharge into trucks or lorries, using cranes and ships' appliances. Both road and rail go to LIVORNO round North end of docks.	Depth alongside uncertain. Ships of over 400 ft. have been seen alongside. East and South-East quays are quite clear of warehouses and obstructions.

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Quayage, Cranage and Clearance from Quays—continued.

Name.	Length (feet).	Width (feet).	Height (feet).	Depth (feet).	No. of berths.	Cranes.			Rail, road and discharge facilities.	
						No.	Capacity.	Type.		
BACINO MERIDIONALE North-West Quay	1,040	62	About 8	About 24	2	One	(?)	Travelling electric	Two railway tracks and road along quay, both joining up with those from New Basin No. 1. Ships discharge into trucks or lorries, using crane and own ap- pliances.	D
South-East side ..	2,560	—	About 8	About 20	—	—	—	—	None	T
EXTENSION OF BACINO MERIDIONALE through East indus- trial zone.	—	—	—	—	—	—	—	—	—	T
West side	About 3,600	—	About 8	Probably shoal except at South end	One small	One	Small	Hand	None known	T
East side	About 3,600	—	About 8	Probably shoal	—	—	—	—	None	N
Canale delle Cater- atte Basin.	570 (North side)	37	About 8	Probably shoal	—	—	—	—	None	N B

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Quayage, Cranage and Clearance from Quays—continued.

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Height (feet)	Depth (feet)	No. of berths	Cranes			Rail, road and discharge facilities	Remarks
			No.	Capacity.	Type.		
About 8	About 24	2	One	(?)	Travelling electric	Two railway tracks and road along quay, both joining up with those from New Basin No. 1. Ships discharge into trucks or lorries, using crane and own ap- pliances.	Depth alongside uncertain. Two ships of 400 ft. have been seen alongside at the same time.
About 8	About 20	—	—	—	—	None	This is not a quay, but small craft appear to lie alongside. A road runs parallel to and 50 ft. behind the sea-wall.
—	—	—	—	—	—	—	This basin is part of the new harbour works, not yet completed, and is probably shoal.
About 8	Probably shoal except at South end	One small	One	Small	Hand	None known	This wall is not quayed but at South end are two small piers jutting out 50 and 25 ft.; a small ship has been seen alongside end of shorter one. Between the piers is a structure somewhat similar to a grain elevator leading to a factory (unidentified).
About 8	Probably shoal	—	—	—	—	None	Not quayed.
About 8	Probably shoal	—	—	—	—	None	Not quayed. A high wall runs 37 ft. behind the basin wall. Basin used by tankers supplying the A.N.I.C. refinery; they appear to moor stern to Eastern end, away from basin sides, which are probably shoal. Two short piers jutting out from East side probably carry pipe-lines. In addition to Canale delle Cateratte, which enters on South, there is a small canal entering on East side between the pipe-line piers.

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Harbour	Area (acres)	Depth (fathoms)	Length (meters)	Breadth (meters)	Water (cubic meters)	Ships (number)	Capacity (tons)	Facilities	Remarks
DARSENA PISA									
East side ..	1,250	—	About 8	Probably shoal	—	—	—	—	No facilities for unloading. A broad road leads round basin 250 ft. behind South end, 100 ft. behind East end, across Canale delle Industrie to the broad road leading from Dogana d'Acqua to East Industrial Zone.
South side ..	About 400	—	—	—	—	—	—	—	
BACINO CAPPELLINI									
Calata Orlando ..	1,640	30	About 8	23—28	3	One One One or 2	30 tons 20 tons 1½ tons	Travelling electric Travelling electric Electric	Railway line along quay. Discharge by cranes or ships' appliances into railway trucks or into lorries on road running along Diga Rettilinea.
Calata Deposito Franco ..	900	50	About 6	23—28	One large, one small	2 One	1½ tons —	Electric Grain elevator	Railway and road along quay. By ships' appliances and cranes into trucks and lorries.
South-Western arm	150 (N.E.) 200 (S.W.)	26	About 6	About 13 (close alongside)	—	—	—	—	Road along arm. No facilities for unloading.
North-East end ..	90+140	—	About 6	Shoal	—	—	—	—	No facilities ..
BACINO FIRENZE									
Calata Pisa ..	1,500 (slightly dog-legged)	220—300	About 8	20—40	3	4	4 tons	Travelling electric (transporter)	Three railway sidings each side of quay. Road from Diga Rettilinea leads along North-West side of quay.
Calata Carrara ..	1,590	60	About 6	20—24	3	—	—	—	Double rail track alongside quay. By ships' appliances into railway trucks.

About 8	Probably shoal	—	—	—	—	No facilities for unloading. A broad road leads round basin 250 ft. behind South end, 100 ft. behind East end, across Canale delle Industrie to the broad road leading from Dogana d'Acqua to East Industrial Zone.	Several lighters have been seen moored stern-on to East wall; small huts extend almost to waterside. South side is occupied by a small ship repair yard; lighters moor stern-on to what wall there is.
About 8	23—28	3	One One One or 2	30 tons 20 tons 1½ tons	Travelling electric Travelling electric Electric	Railway line along quay. Discharge by cranes or ships' appliances into railway trucks or into lorries on road running along Diga Rettilinea.	—
About 6	23—28	One large, one small	2 One	1½ tons	Electric Grain elevator	Railway and road along quay. By ships' appliances and cranes into trucks and lorries.	Chiefly used as a grain quay. The large grain silo is near South-West end of quay.
About 6	About 13 (close alongside)	—	—	—	—	Road along arm. No facilities for unloading.	Small craft berth alongside North-East side.
About 6	Shoal	—	—	—	—	No facilities	This wall is broken by entrance to DARSENA STAZIONE MARITTIMA. In November, 1941, a ship of 260 ft. was moored (parallel to Calata Deposito Franco) stern to wall.
About 8	20—40	3	4	4 tons	Travelling electric (transporter)	Three railway sidings each side of quay. Road from Diga Rettilinea leads along North-West side of quay.	Coal quay. Cranes used for bunkering ships.
About 6	20—24	3	—	—	—	Double rail track alongside quay. By ships' appliances into railway trucks.	Quay formerly used chiefly for loading marble. Canale delle Industrie, 70 ft. wide, leads out of North-East end, leaving 125 and 70 ft. of quay either side. Ships have been seen to moor stern to these quays parallel to line of basin.

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Quayage, Cranage and Clearance from Quays—continued.

Name.	Length (feet).	Width (feet).	Height (feet).	Depth (feet).	No. of berths.	Cranes.			Road, rail, and discharge facilities.	
						No.	Capacity.	Type.		
DARSEN STAZIONE MARITTIMA	—	—	—	—	—	—	—	—	—	T
Calata Massa	800	About 30	About 6	10—14	—	—	—	—	Railway siding along quay.	L
Calata Lucca	650	50	About 6	10—14	—	2	3½ tons	(?)	Many railway sidings, connecting with marsh- alling yard of STAZ- IONE MARITTIMA. By cranes into railway trucks.	L
AVAMPORTO Diga Curvilinea	About 3,500	98	About 26 to top of parapet (?) 15—18 to surface	24 at 80 ft. off; about 7 alongside	—	—	—	—	—	Sh
MOLO MEDICEO West side	460	—	About 6	7—10	—	—	—	—	None	Th
	560	About 30	About 6	About 10	—	—	—	—	No facilities for unload- ing. Quay leads into a walled yard.	Th
	350	36 for South 100 ft.; rest nil.	About 6	About 6	—	—	—	—	High wall blocks North 250 ft. No facilities for unloading in South 100 ft.	Th

*Quayage, Cranage and Clearance from Quays—continued.*214
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Height (feet).	Depth (feet).	No. of berths.	Cranes.			Road, rail, and discharge facilities.	Remarks.
			No.	Capacity.	Type.		
—	—	—	—	—	—	—	This basin is really part of STAZIONE MARITTIMA. Only used for barge and lighter traffic.
About 6	10—14	—	—	—	—	Railway siding along quay.	Large warehouse at North-East end. No apparent facilities for unloading.
About 6	10—14	—	2	3½ tons	(?)	Many railway sidings, connecting with marshalling yard of STAZIONE MARITTIMA. By cranes into railway trucks.	Large warehouse at North-East end. Existence of cranes uncertain.
About 26 to top of parapet (?) 15—18 to surface	24 at 80 ft. off; about 7 alongside	—	—	—	—	—	Ships moor stern-to to bollards on breakwater. In 1941 there were 4 mooring buoys off Northern half of diga to assist this. It might be possible to take craft of 6 ft. draught alongside East side, but the West (seaward) side is composed of loose boulders. A parapet runs along seaward side of breakwater. Boom defence secured 700 ft. North of Southern end.
About 6	7—10	—	—	—	—	None	This wall is not quayed, and there are no facilities. MOLO MEDICEO extends nearly 500 ft. farther North, but West side is only rubble.
About 6	About 10	—	—	—	—	No facilities for unloading. Quay leads into a walled yard.	This is a continuation of the wall above, but is separated from it by a building which reaches down to quayside.
About 6	About 6	—	—	—	—	High wall blocks North 250 ft. No facilities for unloading in South 100 ft.	This quay is on same line as seaplane base, from which it is separated by a building and wall. It makes a slight angle with quay above.

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(C46738)	Seaplane base ..	650	Wide	About 6	2-7	—	(?) 2	Low power	(?) hand	Only facilities are the two possible hand cranes. Two short slipways exist 100 and 350 ft. from North end of quay.	Ex
	Molo Mediceo (East side)	About 1,000	25	2	5 along-side; 24-26 at 50 ft. off	—	—	—	—	By ships' appliances into lighters.	In
	Calata la Bassa ..	250 + 350 (dog-legged)	35	8	Shoal along-side; 27 at 50 ft. off	One	One	(?) 24 tons	Electric (shipyard gantry type)	No discharge facilities.	A
	Calata Sassana ..	230	25	About 8	Shoal	—	—	—	—	No discharge facilities. A road runs along quay, over swing bridge to CALATA LA BASSA.	P
	Calata Ancore ..	560	30	About 8	5-6	—	—	—	—	No discharge facilities. A road runs along quay.	A
	Calata Dogana (Anelli Quay).	625	60	About 12	21	Possibly one	3	2 tons	Electric	By cranes and ships' appliances into lorries.	C

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About 6	2-7	—	(?) 2	Low power	(?) hand	Only facilities are the two possible hand cranes. Two short slipways exist 100 and 350 ft. from North end of quay.	Exits are either through ORLANDO shipyard or over LA SASSAIA bridge on to CALATA ANCORE and thence via DARSENA NUOVO swing bridge and PONTE NUOVO to the old town. <i>Note.</i> —At South end of MOLO MEDICEO is a curious crescent-shaped camber, BOCHETTA S. ROCCA, apparently forming part of seaplane base. It is 300 ft. long and 40 ft. wide. The North-East side is quayed at the same level as seaplane base. South-West side appears to be waste ground and is in ORLANDO shipyard. Soundings of 7 ft. are charted in it.
2	5 along-side; 24-26 at 50 ft. off	—	—	—	—	By ships' appliances into lighters.	In peace-time usually reserved for naval craft. Road immediately behind quay is at a higher level and runs behind this quay and CALATA LA BASSA to CALATA SASSAIA.
8	Shoal along-side; 27 at 50 ft. off	One	One	(?) 2½ tons	Electric (shipyard gantry type)	No discharge facilities.	Apparently part of ORLANDO shipyard. Large sheds behind this quay are reported to be naval. In November, 1941, a cruiser was moored 40 ft. off quay fitting out.
About 8	Shoal	—	—	—	—	No discharge facilities. A road runs along quay, over swing bridge to CALATA LA BASSA.	Projects 100 ft. outside line of CALATA ANCORE.
About 8	5-6	—	—	—	—	No discharge facilities. A road runs along quay.	Apparently only used by very small craft. Shipyard buildings back on to quay.
About 12	21	Possibly one	3	2 tons	Electric	By cranes and ships' appliances into lorries.	Customs shed on quay. North of this quay but set back 100 ft. are the Captain of the Port's offices with landing-steps. There is a mooring buoy off the offices.

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Quayage, Cranage, and Clearance from Quays—continued.

Name.	Length (feet).	Width (feet).	Height (feet).	Depth (feet).	No. of berths.	Cranes.			Rail, road, and discharge facilities
						No.	Capacity.	Type.	
PORTO MEDICEO— <i>cont.</i>									
Short pier off South end of C. Dogana.	175 (North)	45	About 12	23	—	—	—	—	—
	225 (South)	45	About 12	24	One small	—	—	—	—
Calata Elba ..	250	37	About 12	2 along- side; 17 at 100 ft. off	—	—	—	—	No discharge facilities. A broad road runs along front.
Calata Sgarallino	870	18	About 8	22 at 50 ft. off; 9 alongside (West); 4 alongside (East)	One, if cata- marans available	One One 2	6 tons 2 tons 1½ tons	Travelling electric Travelling electric Hand	No discharge facilities at west end. Small cranes discharge cargo from small sailing coasters at East end. Raised rail- way lines along quay.
DARSENA VECCHIA	—	—	—	—	—	—	—	—	—
West side, North ..	430	25	4—6	14	—	—	—	—	No discharge facilities.
West side, South ..	450	25	4—6	14—8	—	One	3½ tons	Fixed	No facilities apart from crane. Road along quay.
East side, North ..	260 (dog- legged)	—	4—6	14	—	—	—	—	No discharge facilities.
East side, South ..	275	—	4—6	6	—	—	—	—	No discharge facilities.

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Quayage, Cranage, and Clearance from Quays—continued.

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LIVORNO

Height (feet).	Depth (feet).	No. of berths.	Cranes.			Rail, road, and discharge facilities	Remarks.
			No.	Capacity.	Type.		
About 12	23	—	—	—	—	—	Used chiefly by small passenger ships from ELBA and the coast.
About 12	24	One small	—	—	—	—	—
About 12	2 alongside; 17 at 100 ft. off	—	—	—	—	No discharge facilities. A broad road runs along front.	Main landing-place, in form of circular steps, is between CALATA ELBA and the short pier.
About 8	22 at 50 ft. off; 9 alongside (West); 4 alongside (East)	One, if catamarans available	One	6 tons	Travelling electric	No discharge facilities at west end. Small cranes discharge cargo from small sailing coasters at East end. Raised railway lines along quay.	Landing-steps under grain silo.
			One	2 tons	Travelling electric		
			2	1½ tons	Hand		
—	—	—	—	—	—	—	The whole basin is given up to lighters and small craft.
4—6	14	—	—	—	—	No discharge facilities.	—
4—6	14—8	—	One	3½ tons	Fixed	No facilities apart from crane. Road along quay.	Large customs sheds on quay; one of the sheds is reported to be a barracks (1940).
4—6	14	—	—	—	—	No discharge facilities.	There are landing-steps, Scali Fascelli.
4—6	6	—	—	—	—	No discharge facilities.	Landing steps at South end, Scalo Michel, lead direct to PIAZZA MICHELI. PIAZZA MICHELI and the ground North of it is in a very rough state; buildings have been demolished and it is used as a circus ground. The British Seamen's Institute is in the North-East corner of the Piazza.

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FOSSO DEI FRANCESI East side	400	—	About 8	4—10	—	—	—	—	No discharge facilities. Road close behind (? at higher level).
West side	550	—	About 8	4—10	—	(?) One	(?) 1½ tons	Fixed	Part of shipyard. Crane at South end.
DARSENА NUOVA East side	720	—	—	Probably shoal alongside	—	—	—	—	No discharge facilities.
South side, fitting- out quay.	400	12	—	About 20	—	One	80 tons	Steam	No discharge facilities.
North side, west of pontoon bridge.	410	15	—	About 12	—	—	—	—	No discharge facilities.

Other Cranage

Several gantry cranes in ORLANDO shipyard.

One floating sheerlegs of 50 tons capacity and one of smaller capacity.

Sheerlegs in shipyard in DARSENА PISA.

(Up to the outbreak of war there were also 10 floating cranes of 15 tons capacity ; these have not all been identified on photographs taken November, 1941.)

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	About 8	4—10	—	—	—	—	No discharge facilities. Road close behind (? at higher level).	This is only the canal joining DARSENA VECCHIA and DARSENA NUOVA, but it appears to be used for mooring lighters. Landing-steps at North-East end.
	About 8	4—10	—	(?) One	(?) 1½ tons	Fixed	Part of shipyard. Crane at South end.	—
	—	Probably shoal alongside	—	—	—	—	No discharge facilities.	Landing-steps occupy nearly the whole length of wall, leaving 180 ft. clear at North end, which is used by lighters.
12	—	About 20	—	One	80 tons	Steam	No discharge facilities.	In November, 1941, a cruiser was fitting out at this quay.
15	—	About 12	—	—	—	—	No discharge facilities.	Large tobacco store charted behind quay. Only lighters and yard craft use this end of basin, the South-West corner of which seems to be in process of reclamation.

Other Cranage

Several gantry cranes in ORLANDO shipyard.

One floating sheerlegs of 50 tons capacity and one of smaller capacity.

Sheerlegs in shipyard in DARSENA PISA.

(Up to the outbreak of war there were also 10 floating cranes of 15 tons capacity ; these have not all been identified on photographs taken November, 1941.)

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Between IL CALAMBRONE (which connects with CANALE DEI NAVICELLI) and TORRE DE MARZOCCO, a mile to the South, the beach is largely mud and weed and has a gradient of about 1:100. It is fronted by shoal water, the 6-ft. contour being at least 400 yards from the shore. Exit from this beach would be on to waste land, and eventually across the railway line running North from the S.I.A.P. oil installation on to the road along the West bank of Canale Dei Navicelli.

Apart from the beaches mentioned above, the only access to the port from the North, without forcing the boom, would be by landing on the North-West side of DIGA MARZOCCO. This would appear quite feasible with light-draught craft and scaling ladders. The side appears clear of protruding boulders, although it is nearly certain that these exist not far below the surface. The top of the breakwater is about 15 ft. wide and about 10 ft. above the water-level, and is moderately smooth until DARSENA PETROLI is reached; thereafter oil pipes run on top of the breakwater to the shore.

DIGA MELORIA.—Landing could quite probably be made on DIGA MELORIA North of the boom. What appear to be mooring buoys are moored alongside the Northern 200 ft. on the East side, but South of that the East side appears clean, and landing by scaling-ladders from small craft should be possible. The height of the diga is about 8 ft., its width 48 ft., but the surface appears very rough.

The West side is charted as being clean, but photographic evidence makes this doubtful.

There appears to be no parapet.

DIGA CURVILINEA.—Landing on DIGA CURVILINEA South of the boom should be possible on the East side. There appear to be at least three landing-places, probably with steps, apart from that at the South lighthouse. The surface appears reasonably smooth but there are many bollards.

Landing on the Western side would appear impracticable.

South.—Orlando shipyard launching basin, south breakwater, is rough and about 6 ft. wide, except at its outer (Western) end where it is about 20 ft. wide with a parapet. Its height is uncertain, but probably not more than 5 ft. excluding the parapet. Loose boulders fringe the entire South side, but the North side of the West end appears clean; about 50 ft. of it lies outside the south end of the boom defence protecting the launching basin.

Should the boom be forced, landing on the retaining wall South of the slipway, about 400 ft. long and 4 ft. high, could be effected from a depth of approximately 4 ft.

Exit from both these landings would be into ORLANDO shipyard. A rough road either North or South of the large shops in the South-West corner of the yard leads directly to the Western of the two main entrances into the yard. Access to MOLO MEDICEO would be round the end of the big building slip to the Southern end of the seaplane base.

Between the shipyard and BAGNI TROTTA are public gardens fronted by a sea-wall. Immediately South of the shipyard the sea-wall is about 12 ft. high, but gradually decreases in height to the South; at BAGNI TROTTA it is between 5 and 6 ft. Between the shipyard and BAGNI REGINA it is fronted by a steep boulder bank. Owing to shoal water, landing would appear impracticable anywhere in front of the public gardens, except inside PORTICCILOLO NAZARIO SAURO or at BAGNI TROTTA.

At the former, landing could be effected at BAGNI REGINA, just inside the entrance, but the landing-places appear too restricted for vehicles. A road 20 ft. wide leads from BAGNI REGINA past a tennis-court on to the promenade of the gardens. The South wall of the PORTICCILOLO is only 10 ft. wide, but deeper water, 8 ft., is charted close-to. A landing-place about 50 ft. square fills the South-West corner of the wall. From there a path runs along the wall to the gardens, which are reached up three or four steps.

At BAGNI TROTTA there is a pier extending about 500 ft. West-North-West. (The short spur charted North of the end has disappeared, but aerial photographs (November, 1941) show breakers at its site, so submerged wreckage probably remains.) Four feet is charted close to the North side at the outer end, and landing could be effected there, or 200 ft.

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On the North side of the pier is an artificial beach, 200 ft. long, with a wall behind it about 3 ft. high. There is direct access from this wall to the pier.

SPIANATA DEI CAVALLEGGIERI is fronted by a rocky ledge, with detached rocks off-lying it. Outside these rocks the depth is 11 ft. A scramble landing should be possible anywhere here, but the landing-craft would probably be holed.

Battery No. 7 is in the grounds of the ACQUARIO on the North-Western corner of SPIANATA DEI CAVALLEGGIERI. A wall about 6 ft. high encloses the side and back of the ACQUARIO.

Between SPIANATA DEI CAVALLEGGIERI and BAGNI PALMIERI (ACQUAVIVA) the only landing-place would be at the children's paddling-pool close North of the latter, where there is a sandy beach enclosed by a wall about 3 ft. high. The approaches to this small beach, about 100 ft. wide, are clear. The exit is by a concrete path, about 10 ft. wide, leading from the North-East corner direct to the main road, which here runs along the sea-wall.

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BAGNI PANCALDI and BAGNI PALMIERI are at a slightly lower level than the roadway and are reached down three or four steps.

PIAZZA S. JACOPO, between the above and the Naval Academy, is on the sea-wall, here 8 to 10 ft. high. The approach to the wall is foul.

South of this the only landing-places (in the area under consideration) are in the boat cambers at the North and South end of the Naval Academy.

Warehouses and Stacking Space

There is warehouse accommodation at the following quays:—

CALATA ORLANDO.

CALATA DEPOSITO FRANCO and CALATA SGARALLINO.

CALATA MASSA and CALATA LUCCA.

Customs warehouses on CALATA DOGANA.

Ample stacking space in new dock area, notably on East side of New Basin No. 1.

In addition warehouse accommodation borders nearly the whole of the town canal system. Much of this is only cellar accommodation. The triangle just North-West of FORTEZZA NUOVA and South of FOSSE REALE is given over entirely to large warehouses.

Facilities for Clearing Port Area

Facilities for clearing the port area are good.

Road.—Quays round PORTO MEDICEO (except CALATA SGARALLINO) are cleared by road over PONTE NUOVO through PIAZZA MICHELI and PIAZZA V. EMANUELE to PIAZZA C. ALBERTO.

Rail.—Nearly all quays other than the above are cleared by rail, in most cases double-tracked.

STAZIONE MARITTIMA in the dock area is a very large marshalling yard. All lines from this marshalling yard cross the causeway down the middle of CANALE DI TORRETTA, which has only a single track. Obstruction might be caused here. SAN MARCO Goods Station is on the other side of this causeway; this is also a large marshalling yard connecting directly with the main railway line.

Although the new dock area (BACINO MERIDIONALE, etc.) would normally be cleared by rail, roads are also available. On the East these lead into the city either North or South of CANALE DI TORETTA; both routes involve right-angled turns through the old city and great organization would be necessary to avoid congestion. On the West side they lead round the end of the new docks into the road down the East side.

Roads and rail clearing the port to the North must pass over the bridges at STAGNO or across the rail bridge West of the road bridges.

Water.—Quality reported to be good. Laid on to quays and also supplied by water boat.

(3) The Town

Description of Town

The town stands in a plain about 3 miles wide from West to East between the sea and hills. The hills curve South-West, and 3 miles South of the town a wooded spur, the MONTENERO (700 ft.), comes close to the coast. One and a half miles North of the town, at CALAMBRONE, a river or canal about 40 yards wide flows into the sea from the East. The area near the coast between this estuary and the town is much cut up by docks and

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The town is described as a modern industrial city; in the last few years a good deal of demolition and new construction has been carried out, but while the main streets are wide and straight the side streets are narrow and dirty and sometimes more tortuous than Plan 3 would indicate. Movement round the harbours and in the Central and Northern parts of the town is restricted by numerous canals crossed by bridges of varying width, mostly permanent and of stone and allowing two-way traffic.

The core of the city, namely, the inner or old town, is an island or peninsula in the shape of a pentagon, the seaward side of which is formed by the quays running North and South on the East side of the Old Dock (DARSENA VECCHIA) and between the Old and the New Dock (DARSENA NUOVA). The old town is surrounded by canals spanned by numerous bridges, mostly flat, but near MERCATO NUOVO there is a narrow iron bridge with steps. On the East the old town is connected with the mainland about half a mile from the quay by PIAZZA CARLO ALBERTO, 250 yards North to South by 80 yards East to West, which is itself built over a canal.

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From the quays enclosing PORTO MEDICEO there is access to the old town by two routes. The more Northerly starts from MOLO MEDICEO about midway along its Eastern side and leads round the South side of the Harbour to the Customs (or ANELLI) Quay, crossing two narrow bridges, the first of stone LA SASSAIA at the South-West corner of the harbour the other a swing bridge at the South-East corner; from the Customs Quay a wide stone bridge (PONTE NUOVO) leads to PIAZZA MICHELI at the West end of the old town; in this piazza there is a conspicuous monument known as I Quattro Mori (The Four Moors). The more Southerly route follows MOLO MEDICEO Southwards into the Orlando Bros. shipyard; from PIAZZA MAZZINI immediately East of these there is access Northwards to the old town along the East quay of DARSENA NUOVA by PIAZZA GIOVANE ITALIA and a wide stone bridge over FOSSE REALE.

The centre of the inner town and of city life generally is PIAZZA VITTORIO EMANUELE II, 330 yards from North to South by 100 yards from East to West, round which the chief public buildings are situated. In its Southern portion stands the Cathedral or Duomo.

This piazza is traversed from West to East by the main arterial street of the city, VIA VITTORIO EMANUELE, which allows for two streams of traffic as well as double tramlines and leads from PIAZZA MICHELI adjoining the Old Dock in a straight line Eastwards to PIAZZA C. ALBERTO. This street is prolonged seaward across PONTE NUOVO to the quay which forms the Eastern boundary of PORTO MEDICEO; landward by VIA DE LARDEREL, leading East-by-North from PIAZZA C. ALBERTO to PIAZZA CISTERNONE and continued as VIALE G. CARDUCCI across VIA AURELIA to PIAZZA DANTE facing the Central Railway Station (STAZIONE CENTRALE) nearly 2 miles from the port.

The old city is encircled by an outer zone of houses and squares bounded by wide straight streets parallel to the sides of the old city at 400-600 yards distance from them. Outside this zone is yet another zone including a good deal of open ground, largely market gardens, bounded in its turn to East, South-East, and South (where it is about 600-700 yards wide) by the main road from PISA (VIA AURELIA) and VIA MONTEBELLO, which branches West a mile South-West of the Central Railway Station. Half a mile to the South another wide street runs to the coast from VIA AURELIA parallel to VIA MONTEBELLO along the right bank of the unimportant streamlet called RIO MAGGIORE. The outer circumference of the city was formerly marked by a high wall; the greater part of this has been pulled down, but some of the gates remain, e.g., the BARRIERA MARGHERITA just North of the outlet of RIO MAGGIORE.

Immediately North-West of the old town is the Old Fortress (FORTEZZA VECCHIA), situated with the bonded warehouses, including a conspicuous high building used as a grain silo, on an island which forms the North-Eastern quay of PORTO MEDICEO; immediately North-East of the old town is the New Fortress (FORTEZZA NUOVA), entirely surrounded by water except for a narrow hump-backed bridge to the South-West. This bridge connects, not directly with the main island on which the old town stands, but with another island (300 yards East to West by 120 yards North to South), traversed from South-West to North-East by VIA BORRA which, starting from North of the PALAZZO DEL GOVERNO and crossing two bridges, leads to the larger island on which is the Port Railway Station (STAZIONE MARITTIMA). This larger area has no access to the other islands or mainland except by bridges: South-East to the old town direct by an iron bridge; North-East, North of DOGANA D'ACQUA, by a strong bridge 25 yards wide, carrying the important traffic route called VIA DI CIRCONVALLAZIONE Eastwards to PIAZZA XI MAGGIO outside the SAN MARCO Goods Station (STAZIONE SAN MARCO), when the street continues as VIA MASTACCHI to join VIA AURELIA. From PIAZZA XI MAGGIO a street (VIA PALESTRO, VIA GALILEI) runs Southward for half a mile to PIAZZA CISTERNONE.

Running Southward from the Southern end of PIAZZA V. EMANUELE II the newly widened VIA CAIROLI crosses FOSSE REALE by a spacious opening (50 yards wide) into PIAZZA CAVOUR (90 by 50 yards), and continues as VIA RICASSOLI to meet VIA

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Westwards, CORSO UMBERTO leads into PIAZZA ORLANDO (300 yards East to West by 75 yards North to South at its Western end, which extends along the South side of the Orlando Bros.' shipyard as far as the sea. Part of the piazza as shown on the plan has now been enclosed in a wall with a blunt angle pointing South-East to form a garden attached to the yards but separated from them by a high wall. There are gates into the yards both East and West of this garden; the main gates are said to be of iron with metal sheets preventing view; the entrance to the administrative offices is said to be from the East, from PIAZZA MAZZINI (375 yards North to South by 80 yards East to West), which is planted with trees and stretches along the East side of the yards as far as the South-East corner of DARSENA NUOVA.

From the seaward end of PIAZZA ORLANDO, a broad modern esplanade, VIALE REGINA MARGHERITA, planted down the middle with small pines and tamarisks (there are no railings), runs South along the coast. For the first 500 yards it is 80 yards wide including

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the gardens; for the next 200 yards the land projects to the West of it to form SPIANATA DEI CAVALLEGGERI, after which the esplanade rejoins the seafront and runs (now 30 yards wide) along it, bearing South-East after 300 yards. After another 150 yards it again leaves the sea, passing landward of the gasometer and the numerous buildings and open spaces of the Naval Academy; the latter are enclosed by iron railings as far South as the BARRIERA R. MARGHERITA, then by a high wall to the point where they end West of the racecourse. Thence the esplanade continues through the residential suburb of ARDENZA to join the main road for the South (VIA AURELIA) in the suburb of ANTIGNANO, where the hills come close to the sea.

On the seaward side of VIALE R. MARGHERITA, at 200 yards from PIAZZA ORLANDO, is a pier, 400 ft. long with a roadway 20 ft. wide, on which is a bathing establishment, the SCOLLIO or BAGNI REGINA, and some flats.

Farther South, in the angle formed by the sea-walls of VIALE R. MARGHERITA and SPIANATA DEI CAVALLEGGERI, is another bathing establishment, BAGNI TROTTA.

The SPIANATA itself includes at its North-Western end a walled-in area about 120 by 120 yards, in which is the two-storied aquarium building and its garden; also, at its Southern end, a space laid out with flower-beds and a round, pillared kiosk (TERRAZZA CIANO). There is no obstacle between the main road and the SPIANATA except at the Northern end of the latter.

South of the SPIANATA two more bathing establishments project into the sea, BAGNI PANCALDI and BAGNI ACQUAVIVA (or PALMIERI).

The buildings facing the sea on the East side of VIALE R. MARGHERITA are large well-built houses, blocks of flats, or hotels, but inland the streets in this district are narrow and slum-like, e.g., VIA DA BASSATA (in which grow scrubby fir trees) and BORGO SAN JACOPO, between which two streets there are small market gardens. Cul-de-sacs are to be expected in this district.

Via MONTEBELLO, which leads inland from a petrol station about 400 yards South of PIAZZA ORLANDO, is rather less wide in the section nearest the sea than farther inland but may be taken as easily allowing two-way traffic throughout. Both it and PIAZZA ROMA, to which it leads, are planted with trees. The streets (BORGO DEI CAPPUCCINI and VIA ROMA) connecting this piazza North-West to the New Dock and North-East to PIAZZA CAVOUR by way of VIA RICASOLI are wide, but the portion of VIA ROMA carrying the tramline South from PIAZZA ROMA is narrow and slum-like. The space off the roads in this neighbourhood, becoming more open to East and South, consists largely of the grounds of large houses and of market gardens; alongside the roads are walls or high and solid iron railings. In this area also air photographs do not disclose cross-lanes not shown in the plan.

(Note.—There is a street running from BORGO DEI CAPPUCCINI between VIA DEI ARCHI and VIA DEL BOSCO South-West to VIA MONTEBELLO.)

The commercial quarter is mainly the inner town, particularly the section between VIA V. EMANUELE and VIA CAIROLI; the best shops are along the former street. There are many small shops, ships' chandlers and the like, in back streets West of PIAZZA V. EMANUELE II.

The industrial quarter lies mainly to the West, North and North-East of the inner town along the railways and canals.

The residential quarter is mainly along the seafront South of the inner town, but the latter contains many large houses and blocks of flats. The residential area is moving Southward, and there are country houses and villas all the way to ANTIGNANO. But there is no geographical separation so far as the town is concerned between the working-class and more prosperous houses, the two being mixed up together.

There are high buildings which may be blocks of working-class flats in PIAZZA FER-RUCCI, and West of it, and also in the area between the SAN MARCO goods station and the new Cemetery.

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There are high buildings which may be blocks of working-class flats in PIAZZA FERUCCI, and West of it, and also in the area between the SAN MARCO goods station and the new Cemetery.

Population

1936 Census : 124,963. (Another source gives 132,496, but this figure probably included an estimated increase since 1936.)

The types in the vicinity of the port are very mixed. They are, for the most part, dock labourers, fishermen, and workmen from the Orlando shipyard, but there is a considerable proportion of negroes and other foreigners, and about 9,000 Jews.

The working classes are generally very poor and the standard of living is low. The middle classes are also poor and their morale is reported not to be high.

There is more drunkenness than in any other part of Italy, and the populace is reported to be hot-headed and quarrelsome.

The Fascist party is active in all branches of civil life, but there is an extensive underground opposition, especially among the working classes and Catholic institutions. The party is unpopular with most Army and Navy regular officers, but the Air Force officers appear to be imbued with Fascist ideas.

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Billeting

Offices—

Governor's Palace (Palazzo del Governo), PIAZZA V. EMANUELE II.
Grand Ducal Palace (Provincial Administration), PIAZZA V. EMANUELE II.
Building at North end of PIAZZA V. EMANUELE II, West of MUNICIPIO.
Building West of PALAZZO DEL GOVERNO, formerly Civil Hospital
Palace Hotel, 41 VIALE R. MARGHERITA, very solidly built.
Club, East side of VIALE R. MARGHERITA, opposite TERRAZZA CIANO.
Naval Academy and Casini, opposite seafont in ARDENZA.

Quarters—

Barracks. (See "(4) Government Establishments".)

Hotels. Palace, 180 beds. (See "Offices" above.)
Terminus Corallo, 115 beds. Opposite CENTRAL Station.
Giappone, 115 beds. 59 VIA V. EMANUELE.
Inghilterra-Campari, 75 beds. 30 VIA V. EMANUELE.
At ARDENZA. La Torre, 50 beds.
At ANTIGNANO. Il Castello, 70 beds.

Private houses. Many converted into flats along main streets; numerous country houses in area to South of town.
Large block, formerly Grand Hotel, at corner of VIALE R. MARGHERITA and VIA MAYER.

Schools. Collegio di S. Giorgio, Naval school for small boys, 100 yards North of PIAZZA ROMA.
Dominicano, East side of BORGO DEI CAPPUCCINI, opposite VIA DEI ARCHI.

Jesuit school, location unknown.

Seminario, PIAZZA CISTERNONE.

Theatres. Goldoni, South-East of PIAZZA CAVOUR.
Politeama, on FOSCO REALE.

Warehouses, etc. Numerous in dock and railway area, North of town.
Mercato Nuovo, main hall (311 ft. by 85 ft.), accommodates shops and stalls.
Many other buildings along the canals encircling old town, and especially in TEATRO S. MARCO area, are warehouses with cellars.

Public Baths

VIA PORTA ALLE COLLINE.

Salone Scali, 38 VIA V. EMANUELE.

Pancaldi and Acquaviva (PALMIERI), establishments on seafont.

Water and Sanitation

By subterranean ducts from COLOGNOLE in hills 5½ miles East of ARDENZA to the CISTERNONE (350 yards South-East of PIAZZA C. ALBERTO), containing a reservoir holding 11,000 cubic metres; main pipe-line is in room on left of entrance. The CISTERNONE supplies the Southern part of the town, and also the CISTERNONE reservoir at the East end of VIA V. EMANUELE; the CISTERNONE supplies the SAN MARCO district and most of the old town.

Some of the water supply for the town crosses the canal and subsidiary channels in the STAGNO area in pipes parallel to the bridges.

Mineral waters from springs North of STAZIONE CENTRALE are bottled at the ACQUE DELLA SALUTE establishment immediately North-West of the station.

Sanitary system is reported to be bad. There are numerous open cesspools and garbage heaps.

M/T and Garages

In view of the presence of naval, military and air units in the neighbourhood, service vehicles should be numerous. Motor buses serve the neighbouring villages, but do not ply

At ANTIGNANO. Il Castello, 70 beds.
Private houses. Many converted into flats along main streets; numerous country houses in area to South of town.
Large block, formerly Grand Hotel, at corner of VIALE R. MARGHERITA and VIA MAYER.
Schools. Collegio di S. Giorgio, Naval school for small boys, 100 yards North of PIAZZA ROMA.
Dominicano, East side of BORGO DEI CAPPUCCINI, opposite VIA DEI ARCHI.
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Public Baths

VIA PORTA ALLE COLLINE.
Salone Scali, 38 VIA V. EMANUELE.
Pancaldi and Acquaviva (PALMIERI), establishments on seafloor.

Water and Sanitation

By subterranean ducts from COLOGNOLE in hills $5\frac{1}{2}$ miles East of ARDENZA to the CISTERNONE (350 yards South-East of PIAZZA C. ALBERTO), containing a reservoir holding 11,000 cubic metres; main pipeline is in room on left of entrance. The CISTERNONE supplies the Southern part of the town, and also the CISTERNINO reservoir at the East end of VIA V. EMANUELE; the CISTERNINO supplies the SAN MARCO district and most of the old town.

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Sanitary system is reported to be bad. There are numerous open cesspools and garbage heaps.

M/T and Garages

In view of the presence of naval, military and air units in the neighbourhood, service vehicles should be numerous. Motor buses serve the neighbouring villages, but do not ply in the town, which is served by electric trams, now being converted to trolley buses; the tramlines remain.

Garages of which the location is known are (a) the large Fiat garage at the Northern end of VIALE R. MARGHERITA; it is used by buses; (b) two garages just East of the PIAZZA MANIN.

There are taxi ranks by the port, by the Central Station, and in PIAZZE V. EMANUELE II, CAVOUR, and CARLO ALBERTO.

Tram depot near PIAZZA MAGENTA.

Horse cabs are still largely used.

Areas for Dumps and Parks

Ground beside VIA AURELIA between new cemetery and PIAZZA FERRUCCI.
PIAZZA DANTE, outside Central Railway Station.

Ground beside VIA AURELIA near PIAZZA D. CHIESA.
Racecourse and stadium South of town.

LIVORNO 223

Vulnerable Points or Points of Tactical Importance

Industrial Establishments, etc.

Power station and transformer station.
Cartridge case plant.
Hydrogenation plant and refinery.
Torpedo factory.

Buildings

Captain of Port's Offices and Customs House.
PORTO FRANCO buildings, including grain silo.
Port Railway Station (STAZIONE MARITTIMA).
Naval Academy.
Palazzo del Governo and Police H.Q. (same building).
Municipio.
Fortezza Nuova.
G.P.O. and Telephone Exchange.
Cisternone.
Central Railway Station (STAZIONE CENTRALE).
SAN MARCO Goods Station.
Two high buildings at junction of VIA RICASOLI with VIA ROMA and CORSO UMBERTO.

Squares (Piazze)

P. MICHELI.
P. ORLANDO
P. V. EMANUELE II.
P. CARLO ALBERTO.
P. CAVOUR.
P. D. CHIESA.
P. ROMA.
P. S. JACOPO.
P. FERRUCCI.
P. XI MAGGIO.

Bridges

In and near old town

PONTE NUOVO.
Bridges across FOSCO REALE: South to PIAZZA GIOVANE ITALIA; South to PIAZZA CAVOUR; two South-East.
Five bridges North from old town between PIAZZA C. ALBERTO and DARSENA VECCHIA.
Narrow bridge to FORTEZZA NUOVA.
Bridge at North-East end of VIA BORRA, West of FORTEZZA NUOVA.

Northern Area

Bridge across canal running northward into DOGANA D'ACQUA.
Bridge, carrying road (VIA DI CIRCONVALLAZIONE) along North side of DOGANA D'ACQUA.
The following bridges carrying road running North from DOGANA D'ACQUA (ARTERIA DEL NUOVO PORTO):
(a) Across canal, railway and canal in first 250 yards North of DOGANA D'ACQUA.
(b) Bridge, carrying side road (leading West to Quay of DARSENA PISA) across CANALE DELLE INDUSTRIE, 200 yards West of Northernmost bridge in (a) above.

Central Railway Station (STAZIONE CENTRALE).

SAN MARCO Goods Station.

Two high buildings at junction of VIA RICASOLI with VIA ROMA and CORSO UMBERTO.

Squares (Piazze)

P. MICHELI.
P. ORLANDO.
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Bridges

In and near old town

PONTE NUOVO.

Bridges across FOSSE REALE: South to PIAZZA GIOVANE ITALIA; South to PIAZZA CAVOUR; two South-East.

Five bridges North from old town between PIAZZA C. ALBERTO and DARSENA VECCHIA.

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Bridge at North-East end of VIA BORRA, West of FORTEZZA NUOVA.

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- (a) Across canal, railway and canal in first 250 yards North of DOGANA D'ACQUA.
- (b) Bridge, carrying side road (leading West to Quay of DARSENA PISA) across CANALE DELLE INDUSTRIE, 200 yards West of Northernmost bridge in (a) above.
- (c) Bridge, probably swing bridge, carrying main road across CANALE DELLE CATERATTE.
- (d) Bridge, 140 yards North-East of (c), across canal flowing North-West into same dock as CANALE DELLE CATERATTE.
- (e) Bridges across CANALE DEI NAVICELLI and CALAMBRONE RIVER 120 yards South and South-West respectively from junction of the two.

One or more of bridges carrying main railway line to PISA across six canals, midway between CALAMBRONE and STAGNO.

North-Eastern Area

Two railway bridges, North of new cemetery, carrying line across VIA AURELIA (new route) and canal.

Bridge, carrying VIA AURELIA over canal 300 yards West of South-West corner of A.N.I.C. oil installation (PONTE UGIONE).

One or more of eight bridges carrying VIA AURELIA (for Pisa) over canals in STAGNO area.

(4) Government Establishments

Barracks

- (a) New Fortress (FORTEZZA NUOVA), used to house one or two infantry regiments (probably only a nucleus at present). In peace Blackshirts in lorries used to emerge from these barracks. A likely place for military headquarters.
- (b) No. 2, VIA DELLA INDUSTRIA, South-East corner of DOGANA D'ACQUA Dock, infantry regiment barracks, probably now occupied by nucleus only, or by Guardia di Finanza (probably about 700 men).
- (c) No. 9, VIA LAMARMORA, West side of PIAZZA XI MAGGIO, probably barracks of one infantry regiment, of which only the nucleus is now present.
- (d) No. 28, VIA NAZIONALE, South-East of town, artillery regiment barracks, known as Caserma Umberto. There is a Red Cross post across street to South-West.
- (e) Old Fortress (FORTEZZA VECCHIA), believed to be the naval barracks, may also house the Milizia Portuaria (about 100 men).
- (f) No. 8, VIA CAIROLI, militia barracks.
- (g) No. 8, VIA G. MARRADI, police (Carabinieri) barracks.
- (h) A building in the Northern part of the East quay of the PORTO MEDICEO (close to Customs' warehouses) is also a barracks (1940).

Captain of Port's offices, North-West end of quay projecting Northwards between PORTO MEDICEO and OLD DOCK (CALATA DOGANA).

Military H.Q., reported to be in FORTEZZA NUOVA.

Fascist H.Q., South-East corner of PIAZZA CAVOUR.

Prison, attached to church of S. CATERINA.

Main Post Office, VIA CAIROLI, West side.

Telephone Exchange (automatic), back of main Post Office.

PALAZZO DEL GOVERNO, including local headquarters and police station, likely to be headquarters of secret police, West side of North end of PIAZZA V. EMANUELE.

Offices of Provincial Council of Corporative Economics, North of above at North-West corner of PIAZZA V. EMANUELE.

Municipal offices (Municipio), North-East corner of PIAZZA V. EMANUELE.

Grand Ducal Palace, headquarters of administration of Province, East side of PIAZZA V. EMANUELE, North end.

Courts of Justice (Tribunale), immediately West of FORTEZZA NUOVA.

Consulates. British and U.S., 3 and 4 SCALI D'AZEGLIO, along North side of FOSSE REALE, South-West side of old town.

German, PALAZZO GALLERIA, VIA CAIROLI.

MERCATO NUOVO, overlooking FOSSE REALE on South-East side of old town.

Banco d'Italia, VIA CAIROLI, East side, South end.

Banco di Napoli, VIA CAIROLI.

"Bottini," viz. old reservoirs with storage capacity for 24,000 barrels of olive oil, VIALE CAPRERA, South-East of port station.

Hospitals. Military, VIALE G. CARDUCCI, North side, 500 yards East of CISTERNONE.

Civil, POLICLINICO CIANO, corner of VIA AURELIA and VIA PORTA

ALLE COLLINE, comprises 20 buildings, with 2,000 beds.

Jewish.

(5) Commercial Establishments

Abattoir

On South-Western side of FOSSE REALE, between gas works and NAFTA oil storage installation. It consists of two parallel lines of four buildings each.

(g) No. 8, VIA G. MARRADI, police (Carabinieri) barracks.
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 German, PALAZZO GALLERIA, VIA CAIROLI.
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 Civil, POLICLINICO CIANO, corner of VIA AURELIA and VIA PORTA ALLE COLLINE, comprises 20 buildings, with 2,000 beds.
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(5) Commercial Establishments

Abattoir

On South-Western side of FOSSE REALE, between gas works and NAFTA oil storage installation. It consists of two parallel lines of four buildings each.

Cartridge Cases, etc.

Societa Metallurgica Italiana di Livorno. The equipment consists of copper smelters rolling mills, wire mills, and plant for the production of electrolytic copper. It specializes in the production and treatment of copper and its alloys in the form of bars, profiles, and wire; it also makes duralumin. Its products are used for the manufacture of cartridge cases (? and shell cases) for the Italian Army and Navy, and also for electrical material.

Cement

Cementaria Italiana. Its productive capacity is said to be 150,000 tons of Portland cement per annum.

Chains

Catonificio Bassoli. The plant is thought to be on the Eastern side of the railway, North-East of Stazione Centrale. It produces chains of all sizes, and also anchors; it is the principal chain-making establishment for the Italian Navy.

Chemical Works

Montecatini. This is thought to be a recently constructed plant; it is between the railway and the CANALE DELLE CATERATTE, adjacent to the North end of the METALLURGICA ITALIANA. It consists mainly of a large compact building (390 ft. by 350 ft.) with a small building that has a tower-like part on the end nearer to the canal. On the far side, next to the railway, are other small buildings and two tanks. There is no indication of any important war industry here, but it is possible that some of the plant formerly used in the production of chemical manures may now be employed for other purposes; before the war it made sulphuric acid and superphosphates. From the situation of the factory and the lay-out of the buildings the production of explosives seems unlikely. This works can be entered from the road which runs parallel to the canal, from the railway, and possibly by boat from the branch canal.

Cotton Mill

Manifatture Toscane Riunite. Across railway from glass works.

Copper Smelting, etc.

See "Cartridge Cases, etc." above.

Cresosoting Plant

Used for treatment of railway sleepers; is at South-Eastern corner of CANALE DEI NAVICELLI.

Electric Cables

Societa Italiana Conduttori Elettrici. On opposite side of road from, and West of, military hospital. It produces electric cables and insulated electric conductors of all kinds.

Glass Works

Vetzeria Italiana Balzaretti-Modigliani. No other information. It is thought that there is another works adjacent to the SAN MARCO Goods Station (on the East side).

Grain Silo

Large building (115 ft. high) on CALATA DEPOSITO FRANCO; storage capacity 120,000 quintals.

Hydrogenation Plant and Refinery, A.N.I.C.

The area covered by this installation is approximately 730,000 square yards. The most important parts of the plant occupy a rectangle with sides of about 800 yards by 450 yards to the South; a more or less triangular area to the North is occupied by oil storage tanks. The purpose of the works is the production of aviation spirit, motor spirit, and fuel from crude oil by hydrogenation and distillation; ALBANIAN crude oil is thought to be the raw material used.

When approached from the side nearest to the sea the works is recognizable by its central high power-house (with a pair of tall smoke-stacks), and a nearby cylindrical cooling tower of exceptional height. A second and similar cooling tower would be visible near the North-East boundary; South of the power station a tall dry-gasholder and a line of narrow structures overtopped by a giant travelling crane should be recognizable features.

The whole works appears to be surrounded by a substantial wall of considerable height, through which there are only two entrances: one from the main road in the centre of the South side, the other where the railway enters the works at the extreme North, beyond the large storage tanks. There are probably guard-rooms at the main entrance, and two small huts in the field opposite to the entrance may provide quarters for the guard.

From the main entrance a broad road runs through the centre of the plant to the tank farm at the North. On either side are substantial buildings with flat roofs, probably offices

Copper Smelting, etc.

See "Cartridge Cases, etc." above.

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From the main entrance a broad road runs through the centre of the plant to the tank farm at the North. On either side are substantial buildings with flat roofs, probably offices and laboratories. The hydrogenation plant lies to the West on the left side of the road; the distillation plants and tankage for finished products lie on the right (to the East).

The Power Station, which is essential to the operation of the plant, lies on the left side of the main road, about 400 yards from the entrance, with one of the big cooling towers just beyond it. The boilers are oil fired. Electric power also comes into the works from the outside; two large lines enter the works at the most Southerly corner, where there is a high, rectangular, flat-roofed building which probably houses transformers. The destruction of these transformers would form a necessary supplement to the stopping of the main power Station.

The cycle of operations carried out at the works starts with crude oil (thought to arrive by rail), which is probably stored in the huge tanks at the Northern end of the works. Here are two tanks of about 150 ft. diameter and seven of about 130 ft. diameter. These tanks are surrounded by bunds, and are almost certainly built of ferro-concrete; they provide a very large storage space, and are connected with small pumping-houses by pipe-lines above ground.

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The crude oil is injected into the conversion cylinders, possibly after a preliminary distillation process, together with hydrogen gas under a pressure of between 300 and 700 atmospheres. The conversion cylinders and other necessary equipment are housed in a series of tall ferro-concrete erections (stalls); there are five or possibly six of these in a row, running North-East and South-West, to the West of the main road. The giant crane at one end of these stalls is used for repairs and servicing. The whole plant works at high pressure, and is connected by a network of strong steel tubing.

The method by which the hydrogen gas is prepared and purified is unknown. The gas plant cannot be identified with certainty; it is probably the structure located near the gas-holders on the South-West side.

The smaller tanks in the centre of the plant probably store the intermediate products of the first reactions, some of which are separated and recirculated.

The main distillation plants, probably four in number, in which the oils are purified, are East of the main road; each is recognizable by high separating columns and a slender chimney.

There are four large floating-roof tanks, about 80 ft. in diameter, near the South-Eastern corner of the works. These tanks were almost empty on 6th November, 1941.

Along the Eastern boundary of the works there are about fifty-three small tanks (15 ft. to 30 ft. in diameter); there are also six rows of structures which appear like horizontal cylinders, and certain groups of plant. The purpose of this area is uncertain. It may possibly be concerned with the separation of butane, a highly inflammable substance.

Vulnerable Points.—In addition to the destruction of the power plant, there are many other very vulnerable areas, and much plant which contains very inflammable material. Demolition in the compressor and circulator houses near the stalls might lead to fires and explosions. The distillation plants would also be very vulnerable; furthermore, the gas-holders contain gases which are highly inflammable.

Important Note.—Any demolition work in the neighbourhood of the distillation plant and especially in the region shown as possibly housing butane storage vessels, must be effected with long delay fuses to allow the site to be evacuated before the butane or other explosive gases are liberated.

Insulators

Fabrica Isolatori makes insulators of all kinds for power stations and transmission lines.

Paint Works

North of the Western end of CANALE DI TORRETTA. No detailed information.

Railway Engine Sheds and Repair Depot

On the North-Eastern side of the town, about 1 mile from the SAN MARCO Goods Station along the Via ERBOSA, lie two important railway installations. One of these is the engine sheds and repair depot lying just West of the railway line; this consists of two ranges of buildings with a space between them. The site is walled round on the East side, and the engine sheds lie at the end of a fan-shaped group of sidings. They occupy an area of about 390 ft. by 156 ft. and further construction is proceeding. Behind these sheds, and connected to them by a single track, is a longer building (430 ft. by 200 ft.) in which repairs are executed. It may be expected that there will be found in these shops some electric locomotives which could readily be put out of action.

Refractories

Societa Materiali Refrattari, immediately South of SAN MARCO Goods Station, makes refractories (firebricks, asbestos, etc.); its productive capacity is said to be 20,000 tons per annum.

Shell Factory

Fratelli Vestriani.

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Shell Factory

Fratelli Vestrini. It is thought that shells up to about 6 in. have been made here. The plant is small and is on the North of VIALE G. CARDUCCI, about 150 yards beyond VIA AURELIA.

Torpedo Factory

Societa Silurificio Moto Fides. A very compact works lies just to the West of the CANALE DELLE CATERATTE and along the new road which leads from the South Basin (BACINO MERIDIONALE) to CANALE DI TORRETTE. It may be recognized by the presence of a high, narrow, rectangular building about 390 ft. long, with its long axis parallel to the street which it overlooks. This building is set back about 20 ft. from the street behind a high wall and beyond it is a compact block of workshops (380 ft. by 600 ft.). Other smaller blocks of shops lie near the street on the side towards CANALE DI TORRETTE; a new building with a flat roof occupies a site overlooking the canal at the back. There are entrances from the street through doors or gates at either end of the high front building; the main entrance is to the South of this building. No entrance is visible at the back of the works.

Photographs give very little indication of the type of work undertaken at this plant. There are no obvious chimneys, and it seems unlikely that any heavy castings or forgings are being produced. All materials and stores are kept under cover and it would seem likely that the work consists mainly in machining and fitting the torpedo mechanism. Power must come from the local electric supply.

Tyres

The PIRELLI factory is on the South side of VIALE G. CARDUCCI.

Coal, Oil and Water

Coal.—Coal depot is on CALATA PISA, but recent photographs (November, 1941) show stocks to be depleted. There are four 4-ton electric transporters at this quay.

Oil.—Four installations:

- (i) Buried tanks, near coast, 1,000 yards North of TORRE DE MARZOCCO. Main tanks are buried; five small tanks (20 ft. diameter) are visible. Site is surrounded by a wall; railway enters by gap in Northern wall; only other entrance is on East side near North-Eastern corner. Pipe runs from a point on Southern wall (near South-Eastern corner) to oiling berths; the pipe skirts the Western side of the S.I.A.P. installation.

- (ii) S.I.A.P. A short distance East-North-East of TORRE DE MARZOCCO. There are 21 tanks in all:—

- 2 tanks of 80 ft. diameter.
- 5 tanks of 75 ft. diameter.
- 2 tanks of 57 ft. diameter.
- 2 tanks of 43 ft. diameter.
- 10 tanks of 15-20 ft. diameter.

- (iii) Government petroleum stores. No information on storage capacity; no tanks can be seen on photographs; possibly used for packed oils only.

- (iv) Nafta Società Italiana del Petrolio ed Affini. Two tanks (diameters 78 ft. and 65 ft.) and two buildings on Western side of railway line close to STAZIONE MARITTIMA (Port station).

Docks, Slipways and Repair Facilities

Graving dock in DARSENA NUOVA:—

Length: bottom, 440 ft.; sea-level, 447 ft.

Breadth: bottom, 50 ft.; sea-level, 72 ft.

Depth over sill: 18½ ft. (*Note.*—Lloyd's (1940) gives 21 ft.)

Patent slip, close west of graving dock:—

Length: extreme, 280 ft.; of cradle, 250 ft.

Depth on blocks: forward, 21 ft.; aft, 24 ft.

Lifting power: 1,500 tons.

Note.—Lloyd's (1940) states that there is a second patent slip of similar dimensions, but there is no photographic evidence to support this (November, 1941).

ODERO-TERNI-ORLANDO S.A. (Orlando Bros.) own the above dock and slip. In addition they have four building slips, one of which is capable of building cruisers of 500 ft.

There are large shops, all centred round DARSENA NUOVA, which can undertake all repairs.

In addition to the above there is a small ship repair yard in DARSENA PISA. The capacity of this yard is not known, but it seems unlikely that it handles craft over 100 ft. in length. It probably builds and repairs lighters. There are sheerlegs in this yard.

(6) Aircraft Factories

None.

(7) Air Facilities

- East side near North-Eastern corner. Pipe runs from a point on Southern wall (near South-Eastern corner) to oiling berths; the pipe skirts the Western side of the S.I.A.P. installation.
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Seaplane Station (Military) at LEGHORN

There is a Seaplane Station situated at the Southern end of the Molo Mediceo. The centre of the front of the building is 058½°, 341 yards from LEGHORN Lighthouse. Width of frontage 35 yards. The protection from weather is excellent. There are five Hangars which accommodate three flights which are said to comprise one reconnaissance squadron of old Flying Boats. There is a cement Slip with rails.

The Workshops only carry out running repairs, but there are full manufacturing facilities in LEGHORN.

Seaplane Base at ORBETELLO

ORBETELLO is an important Seaplane Base, 75' S.E. from LEGHORN, in position Lat. 42° 26' 12" N., Long. 11° 12' 54" E., situated on the lagoons on each side of the narrow neck of land joining the promontory to the mainland.

Aerodromes

There are no aerodromes at LEGHORN.

(C46758)

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(8) **War Material Factories**

SOLVAY Soda Factory : ROSIGNANO.

At ROSIGNANO, 12 miles South of LEGHORN, in position Lat. 43° 23' N., Long. 10° 27' E., within a mile of the sea shore, in an isolated position, except for the houses of the employees around it, is an Alkali Plant of the greatest importance to ITALY. In this factory Sodium, Sodium Carbonate, Caustic Soda, Electrolytic Chlorine, Chloride and derivatives are produced in large quantities. The main GENOA-ROME Railway runs along the West boundary of the site between the works and the sea.

The tall buildings and kilns associated with alkali manufacture are clearly visible from the sea.

The lime waste is put direct into the sea ; this leaves a conspicuous smear of bright, duck's egg green in the water opposite the plant.

See also "(5) Commercial Establishments."

(9) **Power Plants**

Power Station

This consists of a standby steam generating station and a transformer station. In normal times the most important part of the plant is the transformer station which handles the power from the hydro-electric stations. The transformers are housed in the most Easterly buildings of the station. Part of the E.H.T. equipment is in the open air under steel gantries at the North end of the building. The transformers, which are oil-cooled, and the oil-filled circuit breakers are the most vulnerable part of this installation. Damage which cannot be easily or quickly repaired could be readily inflicted. The destruction of the transformers and circuit breakers would isolate much of the town from the grid supply and all of it from current generated on the spot.

The following details of the standby plant are reported :—

Fuel employed : pulverized coal.

Current produced : A.C. 3-phase at 5,000 volts.

Capacity : 45,000 kW. capable of being increased to 100,000 kW.

Open Air Switching and Transformer Station

This lies on the East side of the railway line about 800 yards South of the engine sheds ; it is surrounded by a wall and is about 200 yards long and 95 yards wide. Most of the area is occupied by switchgear with overhead gantries and some transformers in the open. Such transformers and circuit breakers contain very inflammable oil enclosed in a thin metal casing ; they may easily be completely destroyed if perforated and set on fire. Care should be taken to avoid going within several feet of live wires. There are also two (or possibly three) buildings which are believed to contain other transformers and certainly house the remote-control gear for the circuit breakers ; these buildings may be expected to be of substantial construction with very strong doors.

Gas Works

Overlooking FOSSO REALE.

(10) **Transport Facilities**

Roads

Three main roads lead out of the town :—

(A) South to CECINA and ROME.

(B) North-East to PISA.

(C) North to MARINA DI PISA.

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(10) Transport Facilities*Roads*

Three main roads lead out of the town :—

(A) South to CECINA and ROME.

(B) North-East to PISA.

(C) North to MARINA DI PISA.

The first two are sections of the VIA AURELIA, No. 1 of the main roads of ITALY, graded as a Strada Statale, *i.e.*, of the highest class.

The third road has been completed only recently ; it is tarmac (worn in places) and wide enough for at least two-way traffic.

Road (A), to CECINA (22 miles), tarmac, two-way.—North of the suburb of ANTIGNANO (4 miles) there is a choice of routes, either the VIA AURELIA (which bears South-West 1,000 yards South of where it crosses VIALE G. CARDUCCI West of the Central station, and then turns South about a mile farther on at the cemetery which lies on the R. MAGGIORE) or the VIALE R. MARGHERITA along the coast. These two cross TORRENTE ARDENZA (or RIO POPOGNA) by wide bridges 700 yards apart at the South end of the suburb of ARDENZA.

An electric railway runs along the road as far as its Southward turn at the cemetery and then continues Westwards to the Naval Academy.

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Between ANTIGNANO (4 miles) and CASTIGLIONCELLO (13 miles) the road, here of corniche type, passes through a defile between the hills and the sea, running close beside the railway. At some points there are steepish gradients for short distances and sharp turns. Movement of M/T off the road is impossible.

South of CASTIGLIONCELLO the road runs across the plain near the sea, with the railway alongside to landward. Movement off the road should not be difficult; there is not much cover from the air.

The road is vulnerable from the sea throughout.

There is an alternative route, 8 miles longer, to CECINA by the East side of the MONTENERO. This route branches East from the VIA AURELIA about 4 miles North of LIVORNO, just before STAGNO, and turns South at COLLE SALVETTI, whence it runs South over a low pass between the hills. It is reported to be a poor road, just wide enough for two-way traffic.

Road (B), to PISA (14 miles), Tarmac, two-way.—South of STAGNO area.—Traffic from the inner town, passing through PIAZZA C. ALBERTO, follows VIA GARIBALDI to join VIA AURELIA at PIAZZA FERRUCCI, or else takes VIA DE LARDEREL and turns left.

From PIAZZA FERRUCCI the VIA AURELIA runs North as far as the new cemetery, where it curves East, to pass under the main railway line to PISA. 1,300 yards farther on it rejoins the old route of the VIA AURELIA, which has crossed the railway by a level crossing between the cemetery and the new locomotive depot. Seventy yards beyond the junction the road crosses a stream by a bridge (PONTE UGIONE), bears slightly left, and continues dead straight, past the A.N.I.C. oil refinery (on the left) for a mile, till it approaches the canal system near STAGNO (4½ miles).

From PIAZZA FERRUCCI until 800 yards from PONTE UGIONE the electric railway to PISA by way of MARINA DI PISA runs close to the road, on its seaward side, but on a separate embankment.

The road itself is carried on a high embankment where it rounds the cemetery and near the PONTE UGIONE; trees have been planted along it. Normally it is not embanked. The country on either side is for the most part cultivated.

Just North-West of the cemetery the road runs within 500 yards of the road to MARINA DI PISA (Road (C) below), but they are separated by the railway embankment. A high embankment is being constructed from the road to the railway. Farther on, 800 yards before PONTE UGIONE is reached, a side road, perhaps only a farm road, branches North-West from the VIA AURELIA and runs dead straight for 1,400 yards, crossing two canals by bridges to the railway embankment within 150 yards of the road to MARINA DI PISA, but does not cross it. There is, in fact, no road connexion between the VIA AURELIA and the new road LIVORNO-MARINA DI PISA in the area North of the SAN MARCO goods station and South of the canals CALAMBRONE-STAGNO; cross-country movement would be hampered by the railway and various railings.

STAGNO area.—Within a space of three-quarters of a mile the road crosses nine bridges, the first over the single-track railway to COLLE SALVETTI, the remaining eight over canals. Two of these bridges, the fifth and seventh from South to North, are reported to be of iron, only just allowing two-way traffic.

There is a railway station just East of the road before the first canal is crossed. Between the first and second canals the road to COLLE SALVETTI forks right. Between the fourth and fifth there is a space of about 270 yards, in which most of the hamlet of STAGNO is situated. There is a slightly wider space between the fifth and sixth canals. Between the seventh and eighth, a space of hardly 30 yards, the road for FLORENCE (FIRENZE) turns sharp right.

The many bridges in this section constitute a defile which could easily be blocked. There is no other bridge for M/T between STAGNO and the junction of the CALAMBRONE and CANALE DEI NAVICELLI 700 yards from the sea, but about 2,200 yards West of STAGNO the railway crosses the canals by a series of bridges.

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North of STAGNO area.—The road runs straight almost due North over flat reclaimed ground, with pinewoods about 160 yards to the West. About 2 miles from STAGNO it crosses the main railway line LIVORNO-PISA and immediately forks right along the farther side of it, and so continues to PISA; the left fork continues North for 2½ miles to S. PIERO A GRADO, after crossing CANALE DEI NAVICELLI 600 yards from the fork, and half a mile farther on joins the riverside road MARINA DI PISA-PISA.

The VIA AURELIA gives no cover from air observation. The ground off the road in the section North of the STAGNO canals might be waterlogged in winter.

Road (C), to MARINA DI PISA (10 miles), Tarmac, two-way.—The road may be taken as starting, as ARTERIA DEL NUOVO PORTO, immediately North of DOGANA D'ACQUA from VIA DI CIRCONVALLAZIONE, which leads from the Port railway station (STAZIONE MARITTIMA) and the area immediately North of the old town. Traffic from the East and South passes to this starting-point Westwards from PIAZZA XI MAGGIO, which is reached from PIAZZA C. ALBERTO by a street running North along the canal bank and then by VIA SOLFERINO.

Running North, the road at once crosses a wide bridge 180 yards long over (a) a canal, (b) the railway from the port, (c) another canal, and (d) a street. 225 yards from the North end of the bridge it is joined from the South-West by a road connecting with DARSENA PISA and PORTO V. EMANUELE III. It then runs dead straight for 1,200 yards to the quay of BACINO MERIDIONALE, turns inland to cross, almost at once, CANALE DELLE CATERATTE by a swing bridge, and then turns left to run North-West between the railway, about 80 yards to its right, and the Eastern quay of the extension of BACINO MERIDIONALE through the East Industrial Zone, about 300 yards to the left. 160 yards from the turn it crosses a bridge over a small canal.

Although the road approaches to within 500 yards of the road to PISA (VIA AURELIA), the railway separates them and there is *no road connexion* between them.

1,500 yards from the turn, opposite the end of the extension of BACINO MERIDIONALE, the road curves Westward, passing midway between the end of the basin on the South and the Southernmost of the Canals CALAMBRONE-STAGNO on the North (both about 150 yards distant). The electric railway runs alongside the road on the North.

Just where the road is beginning to bear South-West it forks. The left fork continues to bear left and then runs straight due South to the North Quay of BACINO MERIDIONALE; branch roads from it serve the quays on both sides of NEW BASIN No. 1 and connect, by a swing bridge over CANALE DEI NAVICELLI, with the road running down the West side of that canal on to TORRE DI MARZOCO. The right fork runs westwards for 850 yards on an embankment to CANALE DEI NAVICELLI, which it crosses, and then bears North-West to cross the CALAMBRONE River (4 miles), after which it runs due North to MARINA DI PISA, parallel and close to the coast. At both crossings the wide road bridge has, some 20 yards on its inland side, another narrower bridge carrying the electric railway LIVORNO-PISA. Yet a third bridge (one-way only) crosses the CALAMBRONE 250 yards upstream, carrying the road which serves the establishments on the seaward side of CANALE DEI NAVICELLI South of the CALAMBRONE and joins the road to MARINA DI PISA, 250 yards North of the River.

Road (C) runs a tortuous course for the first 4 miles over ground obstructed by canals, railways and industrial establishments. Bridges (including at least one swing bridge) and turns are numerous, and the whole road is of the nature of a defile until the CALAMBRONE is crossed.

The following points seem of special tactical importance:—

- (i) PIAZZA XI MAGGIO.
- (ii) Road junction and bridges immediately North of DOGANA D'ACQUA.
- (iii) Section of road South and East of CANALE DELLE CATERATTE BASIN, including two bridges over canals (one a swing bridge). Railway from Port Station (STAZIONE MARITTIMA) is 80 yards from road.
- (iv) Bridges over CANALE DEI NAVICELLI and R. CALAMBRONE.

Railways

The area extending North and North-East of LIVORNO as far as the line CALAMBRONE-STAGNO is seamed by numerous railway lines and sidings. It is possible that some of these are narrow gauge.

State Railway (Normal Gauge).—LIVORNO is an important station on the main line GENOVA-ROMA, distant 12½ miles from PISA and 21 miles from CECINA. This line is double-track and electrified.

2½ miles North of LIVORNO the line is carried over six canals (hereinafter referred to as "the canals"); 1½ miles farther South it crosses in quick succession the canal flowing into BACINO MERIDIONALE, the electric railway, and the main road (VIA AURELIA), all by

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3¼ miles south of LIVORNO, at ANTIGNANO, the railway enters a defile 8½ miles long, between the hills and the sea, in the course of which it traverses a tunnel 1½ miles long.

LIVORNO Main Station (STAZIONE CENTRALE) lies 1½ miles East of the port; it has engine sheds, repair shops, a marshalling yard, and watering facilities.

From LIVORNO there are branch lines to

- (i) COLLE SALVETTI, 11 miles distant, where it joins the line PISA-CECINA; this line (single-track) forks North-East from the main line about 250 yards South of the canals and, running East, passes under VIA AURELIA South of STAGNO.
- (ii) The Docks, including the two stations, SAN MARCO and MARITTIMA.

There are also spurs to industrial establishments.

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The Docks North and West of BACINO MERIDIONALE are connected with the main line, at a point 1,100 yards from the canals, by a branch curving Westwards, on the outer side of the road, round the North end of the basin forming an extension of BACINO MERIDIONALE through the EAST INDUSTRIAL ZONE. This branch divides on the Western side of this basin into three spurs serving the following three areas, from West to East:—

- (a) The West side of CANALE DEI NAVICELLI, crossing the canal by a swing bridge 220 yards South of the road bridge;
- (b) the East side of CANALE DEI NAVICELLI;
- (c) both sides of DARSENA CIANO; a branch of this spur curves North-West to the angle formed by CANALE DEI NAVICELLI and the canals from STAGNO.

The Docks South and East of BACINO MERIDIONALE are connected with the main line at two points: 1,200 yards from the canals, at the point where Southward traffic on the main line bears left for the STAZIONE CENTRALE; and 800 yards farther South by a switch with a Northward curve, on a high embankment.

120 yards South-West of the point of junction with the switch line, the line for the docks crosses a bridge, 180 yards from the quayside, over the canal flowing Westward into BACINO MERIDIONALE. 900 yards farther South the tracks fan out to a width of 220 yards, forking left to STAZIONE SAN MARCO and right to the STAZIONE MARITTIMA (Port Station) leaving numerous sidings on the Western side.

The branch for STAZIONE MARITTIMA, after passing under the street, crosses a single-track bridge on to a causeway 250 yards long by 25 yards wide projecting into CANALE DI TORRETTA, and on issuing from the causeway immediately passes under the long wide bridge or viaduct carrying ARTERIA DEL NUOVO PORTO (Road (C)) Northward from DOGANA D'ACQUA. The tracks then fan out into STAZIONE MARITTIMA, a spur forking right, across CANALE DELLE INDUSTRIE, to the North-West Quays of BACINO FIRENZE.

Electric Railway.—The electric railway LIVORNO-PISA starts from a station outside the Naval Academy East-North-East along the road to the junction of the latter with VIA AURELIA, which it follows. 550 yards East of the junction it turns North and follows VIA AURELIA to PIAZZA FERRUCCI, after which it runs a little on the seaward side of VIA AURELIA round the West and North sides of the new cemetery and under the normal-gauge railway. Soon afterwards it crosses the canal obliquely, curves North on the West side of the A.N.I.C. oil refinery, bears West to cross over the normal-gauge railway at two points in succession (first the COLLE SALVETTI branch and then the main line), and continues Westwards on an embankment with the canals on the North and the normal-gauge railway and road on its left, till it crosses CANALE DEI NAVICELLI and the CALAMBRONE by bridges about 20 yards upstream of the bridge carrying the main road. It then runs North-North-West straight through pinewoods about 400 yards to landward of the road. At MARINA DI PISA it curves East and continues South of the ARNO and of the riverside road to PISA, 20 miles distant from LIVORNO.

Vulnerable Points

Main Line:—

- (i) Bridges over the six canals which connect the STAGNO area with CALAMBRONE. Obstruction of any one of these would intercept all Northward rail traffic except by the branch line to COLLE SALVETTI or by the electric railway to MARINA DI PISA.
- (ii) Two bridges carrying the electric railway over the normal-gauge lines 70 yards South of the canals. Destruction of these would intercept all Northward traffic from LIVORNO until the tracks were cleared.

120 yards South-West of the point of junction with the switch line, the line for the docks crosses a bridge, 180 yards from the quayside, over the canal flowing Westward into BACINO MERIDIONALE. 900 yards farther South the tracks fan out to a width of 220 yards, forking left to STAZIONE SAN MARCO and right to the STAZIONE MARITTIMA (Port Station) leaving numerous sidings on the Western side.

The branch for STAZIONE MARITTIMA, after passing under the street, crosses a single-track bridge on to a causeway 250 yards long by 25 yards wide projecting into CANALE DI TORRETTA, and on issuing from the causeway immediately passes under the long wide bridge or viaduct carrying ARTERIA DEL NUOVO PORTO (Road (C)) Northward from DOGANA D'ACQUA. The tracks then fan out into STAZIONE MARITTIMA, a spur forking right, across CANALE DELLE INDUSTRIE, to the North-West Quays of BACINO FIRENZE.

Electric Railway.—The electric railway LIVORNO-PISA starts from a station outside the Naval Academy East-North-East along the road to the junction of the latter with VIA AURELIA, which it follows. 550 yards East of the junction it turns North and follows VIA AURELIA to PIAZZA FERRUCCI, after which it runs a little on the seaward side of VIA AURELIA round the West and North sides of the new cemetery and under the normal-gauge railway. Soon afterwards it crosses the canal obliquely, curves North on the West side of the A.N.I.C. oil refinery, bears West to cross over the normal-gauge railway at two points in succession (first the COLLE SALVETTI branch and then the main line), and continues Westwards on an embankment with the canals on the North and the normal-gauge railway and road on its left, till it crosses CANALE DEI NAVICELLI and the CALAMBRONE by bridges about 20 yards upstream of the bridge carrying the main road. It then runs North-North-West straight through pinewoods about 400 yards to landward of the road. At MARINA DI PISA it curves East and continues South of the ARNO and of the riverside road to PISA, 20 miles distant from LIVORNO.

Vulnerable Points

Main Line :—

- (i) Bridges over the six canals which connect the STAGNO area with CALAMBRONE. Obstruction of any one of these would intercept all Northward rail traffic except by the branch line to COLLE SALVETTI or by the electric railway to MARINA DI PISA.
- (ii) Two bridges carrying the electric railway over the normal-gauge lines 70 yards South of the canals.
Destruction of these would intercept all Northward traffic from LIVORNO until the tracks were cleared.
- (iii) Bridge over canal North of new cemetery.
- (iv) Marshalling yards at STAZIONE CENTRALE.
- (v) Bridges over river and main road at ARDENZA, 1,000 yards inland.
- (vi) Numerous points in defile South of ANTIGNANO.

North Docks Line :—

- (vii) At North end of extension of basin in East Industrial Zone, main road, railway to docks, and electric railway (last on embankment) all traverse a neck of land under 250 yards wide between the basin and the canals. Denial of these would intercept all traffic on West side of basin.
- (viii) Traffic for both sides of CANALE DEI NAVICELLI could be intercepted by obstruction of the embankment carrying the line 600 yards East-South-East of the junction of CANALE DEI NAVICELLI with the CALAMBRONE.
- (ix) Traffic for the West side of CANALE DEI NAVICELLI could be intercepted by opening swing bridge over the canal.

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South Docks Line :—

- (x) Bridge over canal flowing into BACINO MERIDIONALE.
- (xi) Bridge leading to causeway in CANALE DI TORRETTA.
- (xii) Marshalling yard at STAZIONE SAN MARCO.
- (xiii) Marshalling yard at STAZIONE MARITTIMA.

Electric Railway :—

- (xiv) Bridge over canal 750 yards South-West of A.N.I.C. oil refinery.
- (xv) Bridges over canal and rivers at CALAMBRONE.

(See also (ii) and (vii) above.)

(11) Signal Communications

There is no commercial W/T Station at LIVORNO, the nearest one is at COLTANO. A small military W/T Station has been reported in the centre of the Town, in the next block of buildings West-South-West of the Town Hall.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

Battery No.	(a) Diameter, (b) Spacing, of emplacements* (feet).		Remarks.	No. of guns or emplacements.	Estimated calibre of guns.	Grading of reports.†		Date of Latest Report.
						Position and No. of Guns.	Calibre.	
1	(a) 15	(b) 60	3 emplacements empty; 1 has 1 very small gun.	4	23-in.	A.3	A.3	6/1942
2	22	60	Lat. 43° 36' 40" N.	4	6-in.	A.2	A.4	6/1942
2A	—	—	Long. 10° 18' 05" E.	4	6-in.	A.2	A.4	6/1942
3	26	105	May be light A.A.	4	6-in. or 4.5-in. or less.	A.2	A.3	6/1942
4	13	90	—	4	5-in.	A.2	A.3	6/1942
5	17	66	—	4	5-in.	A.2	A.3	6/1942
6	16	180	—	2	5-in.	A.2	A.3	6/1942
7	20	75	—	4	6-in.	A.2	A.3	6/1942
8	20	54	Emplacements only; no guns.	4	—	A.2	—	6/1942
9	24	105	—	4	6-in.	A.2	A.3	6/1942
10	30	90	—	4	6-in.	A.2	A.2	6/1942

* The size of the emplacements and their spacing suggest that there are no guns of larger calibre than 6-in. (Graded A.3.)

(c) Local Defences

There are no extensive beach defences, and trench systems, wire or artificial anti-tank obstacles. (Graded A.2.)

(d) Mobile Defences

There are armoured trains on the coastal railway mounting an unspecified number of coast defence guns of unknown calibre; reported that some have six 3-in. A/A guns.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

Battery No.	(a) Diameter, (b) Spacing, of emplacements* (feet).	Remarks.	No. of guns or emplacements.	Estimated calibre of guns.	Grading of reports. ^f		Date of Latest Report.
					Position and No. of Guns.	Calibre.	
1	(a) 15 (b) 60	3 emplacements empty: 1 has 1 very small gun.	4	3-in.	A.3	A.3	6/1942
2	22	60	4	6-in.	A.2	A.4	6/1942
2A	—	Lat. 43° 36' 40" N. Long. 10° 18' 05" E.	4	6-in.	A.2	A.4	6/1942
3	26	105	4	6-in.	A.2	A.3	6/1942
4	13	90	4	4.5-in. or less.	A.2	A.3	6/1942
5	17	66	4	5-in.	A.2	A.3	6/1942
6	16	180	2	5-in.	A.2	A.3	6/1942
7	20	75	4	6-in.	A.2	A.3	6/1942
8	20	54	4	—	A.2	—	6/1942
9	24	105	4	6-in.	A.2	A.3	6/1942
10	30	90	4	6-in.	A.2	A.2	6/1942

* The size of the emplacements and their spacing suggest that there are no guns of larger calibre than 6-in. (Graded A.3.)

(c) Local Defences

There are no extensive beach defences, and trench systems, wire or artificial anti-tank obstacles. (Graded A.2.)

(d) Mobile Defences

There are armoured trains on the coastal railway mounting an unspecified number of coast defence guns of unknown calibre: reported that some have six 3-in. A/A guns. (Graded B.2.)

(iv) Local Seaward Defences

Minefields.—There is no evidence of any kind that any minefields exist in the approaches to LIVORNO.

Booms or Nets.—Booms are in position, as follows:

(a) From South-West end of DIGA MARZOCCO to a point about 182 yards South of North end of DIGA MELORIA, with a gate as indicated on plan.

(b) From DIGA CURVILINEA, 223 yards North of the Southern end, to North end of SECCA PIANA reef, about 600 ft. North of the high light. The gate is about 300 ft. wide, and the middle of it is 750 ft. from the West terminal point. Charted depth at gate is 32 ft. Depths at Western end of boom shoal steeply, depths at Eastern end gradually, to about 10 ft.

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- (c) Protecting the North and West sides of the launching basin of Orlando shipyard. On the West side the boom ends are secured 50 ft. inside heads of breakwaters, and lead to a single buoy midway between them but offset a little to the East.
- (d) Across entrance of building slip of Orlando shipyard (about 900 ft. East of above).
- (e) Round the "Regolo" class cruiser fitting out at CALATA LA BASSA. This boom is open to South-East.

It is reported that the nets of booms (a) and (b) above are supported by iron links from iron cylinders 5 to 6 ft. in length and 2 ft. in diameter.

The primary object of nets of this description would be anti-torpedo, but they would also obstruct submarines and surface craft. An expert opinion considers that, as far as surface craft are concerned, the principal danger would be that of fouling propellers.

It is considered that the best way of dealing with the booms would be to cut the jackstay and tow clear, or, alternatively, to drop depth charges (say of 300 lb.) along the line of flotation.

(v) *Local Air Defences*

For A.A. Defences (Graded A.2), see Plan 15 (November, 1941), adjusted as follows:—

The number of A.A. Batteries round the A.N.I.C. Oil Refinery is increased to 13 light (2-in. or smaller) and one heavy (3-in. or above). (A.2, 1942.)

North of Darsena PISA add 4-gun heavy A.A. Battery. (A.2, 1942.)

Fortezza VECCHIA.—(?) No. and calibre. (C.3, 1942.)

Fortezza NUOVA.—(?) No. and calibre. (C.3, 1942.)

Naval Academy.—(?) No. and calibre. (C.3, 1942.)

S. JACOPO Hospital.—North of, and adjoining the Naval Academy.—(?) No. and calibre. (C.3, 1942.)

Monte BURRONE.—(?) No. and calibre. (C.3, 1942.)

In addition A/A guns were reported in 1940 on the waste ground between the football stadium and the road running between the Naval Academy and the cemetery, and in the trees 1,600 yards South of Coast Defence Battery No. 1 or, roughly, 4,500 yards South of the River ARNO.

(13) *Reconnaissance*

For landing places, see "(2) Port Facilities."

LUSSIN AND CHERSO ISLANDS (INCLUDING WESTERN QUARNERO CHANNEL)

(Lat. 44° 3' N., Long. 14° 29' E.)

(See Plans No. 16 and 17.)

(1) *General Remarks*

LUSSIN PICCOLO Harbour is about 32 miles from POLA, and its situation on the flank of the sea communications with that Port, and at the entrance to the Gulf of FIUME, may render it strategically important as an Advanced Base in time of war. In 1915 there were Austrian T.B.D. and Seaplane Stations here.

North of COROMASNA Point the land is only 100 yards across and about 6 ft. high, which facilitates bombardment of the Harbour from the LUSSIN Channel.

(v) Local Air Defences

For A.A. Defences (Graded A.2), see Plan 15 (November, 1941), adjusted as follows:—
The number of A.A. Batteries round the A.N.I.C. Oil Refinery is increased to 13 light (2-in. or smaller) and one heavy (3-in. or above). (A.2, 1942.)
North of Darsena PISA add 4-gun heavy A.A. Battery. (A.2, 1942.)
Fortezza VECCHIA.—(?) No. and calibre. (C.3, 1942.)
Fortezza NUOVA.—(?) No. and calibre. (C.3, 1942.)
Naval Academy.—(?) No. and calibre. (C.3, 1942.)
S. JACOPO Hospital.—North of, and adjoining the Naval Academy.—(?) No. and calibre. (C.3, 1942.)
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North of COROMASNA Point the land is only 100 yards across and about 6 ft. high, which facilitates bombardment of the Harbour from the LUSSIN Channel.

(2) Port Facilities

LUSSIN PICCOLO Harbour consists of a long narrow inlet at the lowest and narrowest part of LUSSIN Island, and is considered to be one of the best natural harbours in the Northern ADRIATIC. The Outer Anchorage is very deep, and is exposed to Westerly winds. The Inner Harbour provides accommodation for vessels of all sizes and draughts, with good holding ground.

A Canal is in course of construction between the Harbour and the LUSSIN Channel. It is being cut at the narrowest point of land, just to the West of COROMASNA Point. Though reported to be for fishing boats, it is thought that it will be large enough to enable mail steamers to pass through. A climatic feature of this locality and of the ADRIATIC generally is the Bora, a North and North-West wind, which rises suddenly and blows with great violence.

Two large and eight small mooring buoys are kept against the shed on the Jetty near the Pier.

A small pontoon is moored off the Health Office for the use of the Flying Boats of the Societa Italiana Servizio Aerei.

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Other Port Facilities in LUSSIN Island.

PORT NERESINE.—On the Eastern side of the Island connected by the Main Road with LUSSIN PICCOLO.

A good Harbour for vessels up to about 100 tons. It is completely protected by a well built stone Breakwater, which appears to be fairly new.

PORT OSSERO.—The Channel between CHERSO Island and LUSSIN Island (Canale di OSSERO) is about 40 ft. wide and has a depth of about 15 ft., the sides are stone built Quays with bollards and the Road connecting CHERSO Island with LUSSIN is taken over on an iron Swing Bridge.

About 200 yards off the Northern end of the Canal there is one large mooring buoy.

(3) **The Town**

The most important establishment in LUSSIN PICCOLO is the Nautical Training School (for merchant service officers) which is one of the best known in ITALY.

A very high percentage of the men of LUSSIN Island become seamen (or officers).

No fresh water is obtainable. Rain water is used locally and in the dry season is brought by boat from POLA.

The Banca Commerciale Italiana opened a Branch in LUSSIN PICCOLO in 1932. This, taken in conjunction with the increased defences (*see* (12)), possibly foreshadows a growing future importance of LUSSIN Island.

(4) **Government Establishments**

NIL.

(5) **Commercial Establishments**

Coal Mine

The ARSA coal mine, which is an important source of supply for ships from Italian North-East ports, is situated in Lat. 45° 05' 06" N., Long. 14° 06' 00" E., on the East side of the ARSA Channel. It is 3-8' North of the Pontile di CARICAZIONE, to which the coal is transported by electric railway, which serves the main jetty direct. Loading facilities include a travelling crane, several smaller jetties, and cleaning and screening apparatus.

Except for the small Canning Factory there are no other important industries.

The small Shipbuilding Yard has not carried out any building work for nearly two years. No Fuelling Depôts exist.

(6) **Aircraft Factories**

NIL.

(7) **Air Facilities**

There are no facilities for Land Planes owing to the hilly nature of the terrain.

The Harbour is suitable for operating Seaplanes or Flying Boats. A small Slipway exists. There are no buildings suitable for use as Hangars.

(8) **War Material Factories**

None.

(9) **Power Plants**

None.

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(8) War Material Factories

None.

(9) Power Plants

None.

(10) Transport Facilities

Roads

The Main Road running from North to South of the Island is in good condition, and capable of taking heavy motor vehicles.

It is reported that a new Military Road is being built from FERESINA in CHERSO Island to LUSSIN PICCOLO and sections of this Road have been observed off the West coast of CHERSO. It is thought that this Road is being constructed only on CHERSO Island as there does not appear to be the necessity or the room for such a Road in LUSSIN Island.

Airways

S.I.S.A. run a daily Flying Boat Service each way to PORTO ROSE, TRIESTE, BRIONI, LUSSIN PICCOLO, ZARA. The Boats stop at LUSSIN PICCOLO to set down and pick up passengers, they do not refuel. Boats avoid flying near Fort NAZARIO SAURO and passengers are not allowed to carry cameras.

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(11) Signal Communications

W/T Stations

No W/T Station has been observed or heard. The old station on Mount ASINO appears to have been abandoned.

Semaphore Stations

Semaphore Stations, each manned by ten Naval Ratings, have been established as follows:—

- (a) LUSSIN Island at MONTE ASINO.
- (b) Isle UNIE (small Island West of LUSSIN Island)
- (c) CHERSO Island at SMERGO K 277.
- (d) CHERSO Island at PUNTA SAN PIETRO.
- (e) CHERSO Island at PUNTA CROCE.
- (f) Isle SANSEGO (small Island South of UNIE Isle).

Submarine Cables

There are two cables to CHERSO Island, one to UNIE Island, one to SANSEGO Island, and one to S. PIETRO in NEMBI Island (SCOGLIO ASINELLO). There are also cables to PAGO (PAG) Island and to SILBA (SELVE) Island.

(12) Defences

(i) *Sea Front Defences**(a) Coast Defence Batteries*

- Battery No. 1. PUNTA NERA : Four guns of 6-in. calibre ; crew 60.
- Battery No. 2. ALBONA : Situated near the Village of RABAC, two guns of 3.9-in. calibre ; crew 25.
- Battery No. 3. MOSCHIENA : Two guns of 3.9-in. calibre ; crew 25.
- Battery No. 4. PRESTERNICA : Three guns of 6-in. calibre ; crew 30.
- Battery No. 5. GRABVIZZA : Three guns of 6-in. calibre ; crew 30.
- Battery No. 6. SAN MARTINO : Two guns of 3.9-in. calibre ; one gun of 3-in. calibre.
- Battery No. 7. SAN GIOVANNI : Four guns of 3-in. calibre.
- Battery No. 8. SV BLAZ : Two guns of 3.9-in. calibre ; crew 24.
- Battery No. 9. OSERA : Four guns of 6-in. calibre ; crew 50.
- Battery No. 10. FORT NAZARIO SAURO : Eight guns of 6-in. calibre ; crew 100.

These guns are mounted on three levels, the crest of the hill has been levelled and the lower slopes are covered with bushes, trees and stone walls which contrast very noticeably with the bare levelled surface on the crest of the hill.

On the top three guns are sited, also the Control Position and a concrete structure. The entrance to the Fort is on the Southern end of this level, the whole of this area is surrounded by a ditch.

At a level 20-30 ft. lower, there are two or three more guns, one on the Southern corner and another on the Northern corner and the remainder are mounted 60-80 ft. below. A double track Funicular Railway runs from the shore up to the highest level of the Fort. The Old Austrian Battery appears to be deserted but it is included by the barbed wire fence round the Fort and a branch line of the Telegraph wires runs to it.

There is an R.F. Position on the highest level. Fire Control Positions are sited:—

- (a) On the North-West corner of the Fort, concrete with sheer rock below, very conspicuous.
- (b) On the North-East side of the R.F. Position.

Submarine Cables

There are two cables to CHERSO Island, one to UNIE Island, one to SANSEGO Island, and one to S. PIETRO in NEMBI Island (SCOGGIO ASINELLO). There are also cables to PAGO (PAG) Island and to SILBA (SELVE) Island.

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Battery No. 4. *PRESTERNICA*: Three guns of 6-in. calibre; crew 30.
Battery No. 5. *GRABVIZZA*: Three guns of 6-in. calibre; crew 30.
Battery No. 6. *SAN MARTINO*: Two guns of 3.9-in. calibre; one gun of 3-in. calibre.
Battery No. 7. *SAN GIOVANNI*: Four guns of 3-in. calibre.
Battery No. 8. *SV BLAZ*: Two guns of 3.9-in. calibre; crew 24.
Battery No. 9. *OSERA*: Four guns of 6-in. calibre; crew 50.
Battery No. 10. *FORT NAZARIO SAURO*: Eight guns of 6-in. calibre; crew 100.

These guns are mounted on three levels, the crest of the hill has been levelled and the lower slopes are covered with bushes, trees and stone walls which contrast very noticeably with the bare levelled surface on the crest of the hill.

On the top three guns are sited, also the Control Position and a concrete structure. The entrance to the Fort is on the Southern end of this level, the whole of this area is surrounded by a ditch.

At a level 20-30 ft. lower, there are two or three more guns, one on the Southern corner and another on the Northern corner and the remainder are mounted 60-80 ft. below. A double track Funicular Railway runs from the shore up to the highest level of the Fort. The Old Austrian Battery appears to be deserted but it is included by the barbed wire fence round the Fort and a branch line of the Telegraph wires runs to it.

There is an R.F. Position on the highest level. Fire Control Positions are sited:—

- (a) On the North-West corner of the Fort, concrete with sheer rock below, very conspicuous.
- (b) On the North-East side of the R.F. Position.
- (c) On the Southern end of the concrete part of the Fort is a steel structure embedded in concrete and camouflaged.

Battery No. 11. *ZIGALE*: Four guns of 3-in. calibre.

(d) Magazines

It is thought probable that the Main Magazine is situated in the South part of Fort NAZARIO SAURO, for what appear to be magazine vents have been discovered.

Additional Magazines possibly exist on the lower slope on which the Austrian Battery is situated.

(iii) Searchlights

Although careful visual search has been made, no Searchlights have so far been observed. This may be accounted for by the fact that they have not yet been put into position, or that they have been well concealed. Mobile lights are unlikely owing to the difficult nature of the terrain.

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(iv) *Local Seaward Defences*

None observed.

Concrete bollards are in position on each side of the main entrance to LUSSIN-PICCOLO possibly for the anchoring of some type of Boom or Net.

(v) *Local Air Defences*

(a) *A.A. Batteries*

These are situated on the top of Hill 318: the hill is covered with scrub and small trees and is intersected with stone walls which make the position very difficult to locate.

Three, possibly more, A.A. guns, 3-in. or 4-in. exist.

A Hut, built of concrete, possibly a Control Position, is situated on the East side of the hill top: this position is enclosed by a high barbed wire fence.

There are gun emplacements and a Magazine, at present disused, on Mt. VELO STRAZA. This is probably the site of an old Austrian A.A. Battery. The emplacements are in a good state of repair and have probably been improved by the Italians.

(viii) *Garrison*

The Garrison of LUSSIN Island consists of about 2,000 men not including the guns' crews. They do not live in the Fort itself, but in a building at the bottom of the hill.

There are no other troops on the Island.

A light railway and concrete runway leads from a stone Pier past the ruins of the W/T station up to the Fort.

(13) *Reconnaissance*

Possible Objectives

Fort NAZARIO SAURO and the small Shipbuilding Yard owned by the firm of Martinolich, at which ships up to about 600 tons are built and small repairs can be carried out.

The Fort is a possible target for air attack, though it is defended by the A.A. Defences on Hill 318, it is easy to locate being opposite to the entrance to the Harbour.

Attack by ships' guns would be difficult, since owing to the flat trajectory at short ranges and to some of the guns being on certain bearings on the sky line, a direct hit would be necessary. Spotting would be very difficult.

A bombardment to be effective would probably have to be carried out at long range.

The slopes render local defence easy.

Owing to the rocky nature of the ground, trenches could not be constructed, but there are a number of stone walls which intersect the hillside. Similar walls are found all over the Peninsula.

There is unlimited choice for M.G. Positions with excellent command and good cover, rendering location difficult.

Two possible M.G. concrete Pill Boxes exist. Additional possible M.G. Positions are sited on the North-West and South-East side of the Port.

MONOPOLI

(Lat 40° 57' N., Long. 17° 18' E.)

(See Admiralty Chart 199)

(1) *General Remarks*

MONOPOLI lies about 35 miles West-North-Westward of BRINDISI. The harbour affords shelter for small vessels which anchor close in with the stern warp to the shore. Large ships can, in fine weather, anchor outside the moles. It is a small commercial harbour from which are exported oil, dried fruits, lime and cement and into which are imported coal, grain, cattle, wood, tiles and sulphur.

(viii) *Garrison*

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(See Admiralty Chart 199)

(1) *General Remarks*

MONOPOLI lies about 35 miles West-North-Westward of BRINDISI. The harbour affords shelter for small vessels which anchor close in with the stern warp to the shore. Large ships can, in fine weather, anchor outside the moles. It is a small commercial harbour from which are exported oil, dried fruits, lime and cement and into which are imported coal, grain, cattle, wood, tiles and sulphur.

(2) *Port Facilities*

General

The harbour is formed by two moles and is well sheltered: entrance to it is sometimes difficult in strong North-Easterly and Easterly winds: bad holding ground.

Moles and quays

A mole extends about a cable Northward from the Castle and forms the Eastern side of the harbour. At the Northern side a mole extends 1½ cables East-North-Eastward from the shore and then curves South-Eastward for a rather greater distance. The Northern mole is being extended and the above water extremity is marked by a light column.

Depth of Water

At the entrance between the heads of the moles there are depths of 5½ to 6 fathoms: there is a passage with a depth of 6½ fathoms in the middle to the southern part of the harbour which shoals gradually to 2 fathoms off the quay.

MONOPOLI
NAPLES 237

(3) The Town

The population of MONOPOLI is about 26,000.
There is a good hospital for seamen.

(5) Commercial Establishments

S.I.A.P. Fuel Storage

There are three large oil fuel tanks, capacity not known, sited at the root of the Northern breakwater and clearly visible from seaward. A pipeline runs the length of this breakwater with connections for fuelling.

There are other tanks, position not known, but probably underground: the total oil fuel storage for the port amounts to 45,000 tons.

(10) Transport Facilities

MONOPOLI is on the Main East Coast Road: BARI is the nearest large town to the North-Westward. The road to the South-Eastward branches at FASANO for TARANTO, which is South by West, and BRINDISI.

Railway

MONOPOLI is on the main East coast railway, which passes through BRINDISI and BARI. Vulnerable points on the above road and railway are described in Section IV (3), AREA D, Section 1, and are indicated on Plan 87.

(11) Signal Communications

Telegraph and Telephone Services.

(12) Defences

No information is available other than as indicated in Section V (5)—Coast Defences at Intermediate points between Ports.

NAPLES

(Lat. 40° 50' 19" N., Long. 14° 15' 36" E.)

(See Plans 25, 25A and 25B)

(1) General Remarks

NAPLES is the second largest city in ITALY with a population of about 864,600. The port has in recent years been developed from a commercial rather than a naval point of view. Trade is considerable. In 1934, 9,825 vessels totalling 11,410,000 tons entered the port. Since the bombing of naval bases in Southern ITALY, however, more frequent use has been made of NAPLES by heavy units of the fleet.

It is one of the chief supply bases for LIBYA.

Conspicuous Objects

Light structure—white iron framework—on the head of Molo SAN VINCENZO. Light structure—black iron framework—on the South-Western extremity of ANTEMURALE THAON de REVAL.

Tides

The level of the sea in the harbour is mainly influenced by the wind: in Southerly gales it rises about a foot above mean level and falls about the same amount below it in strong Northerly winds.

(2) Port Facilities

which is South by West, and BRINDISI.

Railway

MONOPOLI is on the main East coast railway, which passes through BRINDISI and BARI. Vulnerable points on the above road and railway are described in Section IV (3), AREA D, Section 1, and are indicated on Plan 87.

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Tides

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(2) Port Facilities

Description of Harbour

The harbour is on the Northern shore of the Gulf of NAPLES and is enclosed by the Molo SAN VINCENZO and a right-angled detached mole, the Western arm of which is called ANTEMURALE THAON de REVAL, and the Eastern arm Diga FORANEA EMANUELE FILIBERTO DUCA d'AOSTA. The entrance usually used by warships is between these two moles.

There is also a small detached breakwater protecting the main entrance at the Eastern end of the Molo SAN VINCENZO called Diga DUCA degli ABRUZZI.

The length of the harbour from East to West is about 4,000 yards.

Immediately North of the Western end of the Molo SAN VINCENZO is the Bacino del LITTORIO IDROSCALO CIVILE, bounded on the West by Calata BEVERELLO and on the North by Molo LUIGI RAZZA (ANGIOINO), in which is the STAZIONE MARITTIMA del LITTORIO. Within this area is the Naval Port in which there is a small dry dock which is situated 400 yards along the Molo SAN VINCENZO from the landward end.

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Molo LUIGI RAZZA has been reconstructed and is now rectangular in shape. Part of the naval port has been dredged to a depth of over 36 ft. to provide a turning basin for vessels using its Southern side. The North side appears to be used only by medium-sized vessels.

To the North-Eastward of Molo LUIGI RAZZA is Molo del CARMINE, and between these two moles is the Commercial Port.

On the Western and Northern sides of the Commercial Port are Calata PILIERO, Pontile IMMACOLATELLA VECCHIA and Calata PORTA di MASSA. To the North-Eastward is the Molo CARLO PISACANE, on which is the Port Office.

Between the Molo CARLO PISACANE and Molo del CARMINE, with its extension Molo MARTELLO, is the Bacino PRINCIPE di PIEMONTE which is bounded on the North by Calata VILLA del POPOLO. To the East of Molo del CARMINE, enclosing a Patent slip and two dry docks in Darsena dei BACINI, the Repairing Basin, is Molo CESARIO CONSOLE.

On its Southern end a dry dock, for the "Littorio" and "Roma" class battleships, is about half constructed.

To the East of Molo CESARIO CONSOLE lies Darsena ARMANDO DIAZ, which is enclosed on the North and East by Calata della MARINELLA and Pontile VITTORIO EMANUELE II respectively.

Between Pontile VITTORIO EMANUELE II and Pontile DUCHESSA ELENA d'AOSTA, to the Eastward, is Darsena VITTORIO VENETO with Calata VITTORIO VENETO on its Northern side.

Between Pontile DUCHESSA ELENA d'AOSTA and Pontile GIOVANNI BAUSAN lies Darsena GRANILI, which is bounded on its Northern side by Calata GRANILI.

Darsena POLLENA, with Calata POLLENA and Calata VIGLIENA on its Northern side, lies between Pontile GIOVANNI BAUSAN and Pontile VIGLIENA.

That part of the harbour which lies North of Diga FORANEA EMANUELE FILIBERTO DUCA d'AOSTA is known as Bacino VITTORIO EMANUELE III.

Mooring Buoys

There are four mooring buoys off the North side of Diga FORANEA EMANUELE FILIBERTO DUCA d'AOSTA, and five off the Molo SAN VINCENZO.

Accommodation

There is accommodation for a large number of ships alongside the various quays: some particulars of the uses to which berths are put are indicated in the table which follows.

Other Lifting Appliances

There are two floating cranes: capacities 40 and 10 tons respectively.

Trade

Imports include manufactured goods, colonial produce, coal, iron, oil, copper and machinery.

The principal exports are silks, cheese, fruit, hemp, wines and cotton goods.

Estimated Daily Capacity

(In terms of d.w. tons of Military Stores, exclusive of M/T. For every 100 M/T vehicles unloaded the amount of Military Stores would be reduced by 400 tons.)

Quayage.		Capacity in Tons.
MOLO LUIGI RAZZA (South)	..	500
MOLO LUIGI RAZZA (North)	..	400
CALATA COSTANZO CIANO (2)	..	500
PONTILE IMMACOLATELLA VECCHIA	..	300
CALATA PORTA DI MASSA	..	800
MOLO CARLO PISACANE	..	800

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Between Pontile VITTORIO EMANUELE II and Pontile DUCHESSA ELENA d'AOSTA, to the Eastward, is Darsena VITTORIO VENETO with Calata VITTORIO VENETO on its Northern side.

Between Pontile DUCHESSA ELENA d'AOSTA and Pontile GIOVANNI BAUSAN lies Darsena GRANILI, which is bounded on its Northern side by Calata GRANILI.

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Quayage.	Capacity in Tons.
MOLO LUIGI RAZZA (South)	500
MOLO LUIGI RAZZA (North)	400
CALATA COSTANZO CIANO (2)	500
PONTILE IMMACOLATELLA VECCHIA	300
CALATA PORTA DI MASSA	800
MOLO CARLO PISACANE	800
CALATA VILLA DEL POPULO	1,000
MOLO DEL CARMINE (West)	1,500
MOLO DEL CARMINE (East)	500
MOLO CESARIO CONSOLE (East)	1,300
CALATA DELLA MARINELLA	1,200
PONTILE VITTORIO EMANUELE II (West)	900
PONTILE VITTORIO EMANUELE II (East) (3)	1,000
CALATA VITTORIO VENETO	400
PONTILE DUCHESSA ELENA D'AOSTA	1,600
CALATA GRANILI	400
PONTILE GIOVANNI BAUSAN	1,600
CALATA POLLENA	1,200
Total, say	16,000 tons.

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No.	Dimensions.		Tons.	Cranes.		Type.	Discharge facilities.	Remarks.
	Length.	Breadth.		No.	Lift.			
1	492	600.	—	2	—	Electric.	Railway sidings connect with docks system.	Used by submarines: a total of 15 can lie in the Naval Port. Also used by coasting vessels.
2	1,800	600.	—	6	3-5	Fixed.	Railway sidings connect with docks system.	South side: berth for largest liners or a battleship. North side: used for shipping goods into barges. On the mole is STAZIONE MARITTIMA del LIT-TORIO. There are powerful pumping appliances.
3	656	—	—	4	—	—	Railway sidings connect with docks system.	Used by sailing vessels and tugs.
4	407	407	—	—	—	—	—	The South-West side is occupied by the Port Authorities. The North-East side and free end are used by coasting vessels.
5	1,148	—	—	4	1-5-3	Electric fixed.	Railway sidings connect with docks system.	All vessels, including destroyers, lie stern-to. Extensive warehouses.

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Moles, Quays and Jetties—Summary

Name.	Depth alongside.	Dimensions.		Cranes.			Discharge facilities.	
		Length.	Breadth.	No.	Lift	Type.		
MOLO SAN VINCENZO ..	ft. East end 65. West end minimum of 23.	ft. 4,950	ft. 100	—	tons. —	—	—	For P C E L N
CALATA BEVERELLO ..	16-30	492	—	2	—	Electric.	Railway sidings connect with docks system.	Use in ve
MOLO LUIGI RAZZA (ANGIOINO).	Sufficient for ships drawing 36 ft.	1,800	600.	6 1	3-5 —	Fixed. Travelling.	Railway sidings connect with docks system.	Sou be g S T ap
CALATA COSTANZO CIANO (PILIERO).	10-16	656	—	4 (Projected in 1940.)	—	—	Railway sidings connect with docks system.	Use
PONTILE IMMACOLATELLA VECCHIA.	Free end and North-East side 21-23.	407	407	—	—	—	—	The A en
CALATA PORTA DI MASSA	23-26	1,148	—	4 3	1.5-3 —	Electric fixed. Electric travelling.	Railway sidings connect with docks system.	All R

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Moles, Quays and Jetties—Summary

Dimensions.		Cranes.			Discharge facilities.	Remarks.
Length.	Breadth.	No.	Lift	Type.		
ft. 4,950	ft. 100	—	tons. —	—	—	For a distance of 1,000 yards from the Eastern end battleships and/or heavy cruisers can moor alongside or stern-to. Eight or more submarines can lie stern-to in the Naval Port. There is 36 ft. of water between this mole and MOLO LUIGI RAZZA in the outer half of the Naval Port (BACINO del LITTORIO).
492	—	2	—	Electric.	Railway sidings connect with docks system.	Used by submarines a total of 15 can lie in the Naval Port. Also used by coasting vessels.
1,800	600.	6 1	3-5 —	Fixed. Travelling.	Railway sidings connect with docks system.	South side: berth for largest liners or a battleship. North side: used for shipping goods into barges. On the mole is STAZIONE MARITTIMA del LITTORIO. There are powerful pumping appliances.
656	—	4 (Projected in 1940.)	—	—	Railway sidings connect with docks system.	Used by sailing vessels and tugs.
407	407	—	—	—	—	The South-West side is occupied by the Port Authorities. The North-East side and free end are used by coasting vessels.
1,148	—	4 3	1.5-3 —	Electric fixed. Electric travelling.	Railway sidings connect with docks system.	All vessels, including destroyers, lie stern-to. Extensive warehouses.

NAPLES 239

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Moles, Quays and Jetties—Summary—continued

Name.	Depth alongside.	Dimensions.		Cranes.			Discharge facilities.	
		Length.	Breadth.	No.	Lift.	Type.		
MOLO CARLO PISACANE ..	ft. West side 33. East side 20-26. Free end 20-26.	ft. West side 738. East side and free end 900.	ft. South end 150. Centre 370. Root 600.	—	tons. —	—	Railway sidings connect with docks system.	Port ves Pa alo
CALATA VILLA DEL POPOLO	20-23	984	—	7	1-5-3	Electric travelling.	Railway sidings connect with docks system.	Used th 10 an
MOLO DEL CARMINE (MOLO MASANIELLO).	West side 28-33. East side 28-33.	West side 1,512. East side 820.	Root 320. Free end 160.	13	1-5-4	Travelling electric.	Railway sidings connect with docks system.	Wes ce 12 co
MOLO MARTELLO	Inner side 7-10. Outer side 23-29.	820	50	—	—	—	—	Rur on by st
MOLO CESARIO CONSOLE..	West side 13-26. East side 24-30.	West side 700. East side 1,500.	330	West side 1. East side 5.	West side 10. East side 3-4.	Fixed electric. Travelling Electric.	—	The ty re co
CALATA DELLA MARINELLA	25-30	1,312	—	1	3	Electric travelling.	Railway sidings connect with docks system.	Wai
PONTILE VITTORIO EMANUELE II.	East side 28-33. West side 20-33.	East side 1,148. West side 1,230. Free end 1,100.	550	East side 8. West side 4.	— West side 4.	Electric. Travelling electric.	Railway sidings connect with docks system.	Coa E u

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Moles, Quays and Jetties—Summary—continued

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NAPLES

Side.	Dimensions.		Cranes.			Discharge facilities.	Remarks.
	Length.	Breadth.	No.	Lift.	Type.		
ft.	ft.	ft.		tons.			
West side	738.	South end 150.	—	—	—	Railway sidings connect with docks system.	Port Office. Western side used by passenger vessels: used by the daily Naples-Palermo mailboat: vessels can moor alongside.
East side and free end	900.	Centre 370. Root 600.					
23	984	—	7	1-5-3	Electric travelling.	Railway sidings connect with docks system.	Used by vessels discharging grain into Silos: they can moor alongside. Grain elevators: 100 tons per hour. Warehouses for grain and cold storage.
West side	1,512.	Root 320.	13	1-5-4	Travelling electric.	Railway sidings connect with docks system.	Western side: used by vessels discharging cereals in sacks and general cargoes. Eastern side: used by vessels discharging coal for State Railways.
East side	820.	Free end 160.					
820	50	—	—	—	—	—	Runs West, curving Southward from outer end of MOLO DEL CARMINE: used by vessels discharging dangerous cargoes such as explosives, etc.
West side	700.	330	West side 1.	West side 10.	Fixed electric.	—	The West side is occupied by repairing basin, two dry docks, a shipbuilding yard and repair workshop. Large dry dock under construction on Southern end.
East side	1,500.		East side 5.	East side 3-4.	Travelling Electric.		
1,312	—	1	3	Electric travelling.	Railway sidings connect with docks system.	Warehouses.	
East side	1,148.	550	East side 8.	—	Electric.	Railway sidings connect with docks system.	Coaling base on both sides. Coaling by basket: rate 100 tons per hour. Also used for embarking troops.
West side	1,230.		West side 4.	West side 4.	Travelling electric.		
Free end	1,100.						

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(C46788)	CALATA VITTORIO VENETO	25-28	700	—	—	—	—	Railway sidings connect with docks system.	Use ho
	PONTILE DUCHESSA ELENA D'AOSTA.	35	850	335	West side 2. East side 2.	West side 3-5.	Electric.	Railway sidings connect with docks system.	Wan at
	CALATA GRANILI	33-35	650	—	—	—	—	Railway sidings connect with docks system.	Wan
	PONTILE GIOVANNI BAUSAN	35	830	325	West side 4. East side 4.	West side 3-5.	Electric.	Railway sidings connect with docks system.	Wan fo
	CALATA POLLENA	26-36	1,450	—	—	—	—	—	Wan
	PONTILE VIGLIENA ..	West side 28-33. East side 13. Free end 36.	820	328	—	—	—	Pipelines	Wan fo fo
	ANTIMURALE THAON DE REVAL.	North end 72. South end 37.	1,500	North end 30. South end 60.	—	—	—	—	Thro

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38	700	—	—	—	—	Railway sidings connect with docks system.	Used for mooring sailing vessels. Warehouses.
5	850	335	West side 2. East side 2.	West side 3-5.	Electric.	Railway sidings connect with docks system.	Warehouses: used for discharging timber and embarking troops.
35	650	—	—	—	—	Railway sidings connect with docks system.	Warehouses.
5	830	325	West side 4. East side 4.	West side 3-5.	Electric.	Railway sidings connect with docks system.	Warehouses: used for embarking troops, and for unloading coal.
06	1,450	—	—	—	—	—	Warehouses.
side 38, side end	820	328	—	—	—	Pipelines	Western side and free end used by tankers for discharging oil. The Eastern side forms a breakwater.
end end	1,500	North end 30. South end 60.	—	—	—	—	Three or four merchant ships secure stern-to and discharge into lighters.

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It is unlikely that the Port would handle as much as 16,000 tons Military Stores (or similar miscellaneous cargo) per day, owing to clearance difficulties. The estimate does, however, indicate that even if 50 per cent. of the berths were out of action some 8,000 tons per day could still be handled.

Harbour Craft

Tugs.—Several. Details not known.

Cargo Lighters and Barges.—About 500, all non-self-propelled; aggregate capacity about 29,000 tons.

Salvage Vessels.—"Littorio" and "A. Witting" are equipped with pumps for salvage work.

Water Tanks.—The ACQUEDOTTO PORTUALE (Port Water Authority) has about 10 water barges of which four are self-propelled; aggregate capacity of the latter is about 700 tons.

Motor Trawlers.—There are at present about six motor trawlers of tonnage 10-120. The "Italia" is 118 ft. by 26 ft. by 10 ft., and the "Alessandra" 96 ft. by 26 ft. by 9 ft.

Docks

There are three Graving Docks, a fourth under construction, and one small Floating Dock situated as follows:—

- (a) Large Commercial Dock at the North side of the Repairing Basin: 664 ft. by 77 ft. by 30 ft.; heavy cruisers use this dock.
- (b) Small Commercial Dock alongside (a): 371 ft. by 46 ft. by 22 ft.
- (c) Government Dock situated 400 yards along the Molo SAN VINCENZO from the Western end: 247 ft. by 62 ft. 4 in. by 21 ft. 4 in. on sill. Vessels drawing 19 ft. 6 in. can be docked.
- (d) Small Floating Dock: 400 ft. by 80 ft. (approx.), situated 350 yards West-North-West of VIGLIENA Mole, in the DARSENA POLLENA.

This dock is used by submarines. This fact coupled with the submarine activities in the basin and workshops in the quay points to the use of this basin as a Submarine Repair Base.

A large Dry Dock, which will be capable of receiving a 35,000-ton battleship, is under construction at the Southern end of Molo CESARIO CONSOLE: its dimensions will be 1,145 ft. by 131 ft. by 43 ft.; it is less than half finished.

Slipways

There is a Patent Slip in the North-West corner of the Repair Basin capable of hauling up 1,000 tons; it is 492 ft. long and its cradle is 229 ft. long; lift 1,000 tons.

Six new Slipways are under construction: largest will take ships up to 5,000 tons.

Warehouses

There are numerous warehouses in the docks, the most notable of which is the large collection of warehouses on the CALATA PORTA DI MASSA: the large granary on the CALATA VILLA DEL POPULO, which has its own jetty on which there are four elevators; the large well-ventilated warehouse running the whole length of the MOLO DEL CARMINE; the warehouses on the PONTILE VITTORIO EMANUELE II and PONTILE DUCHESSA ELENA D'AOSTA; and a large well-ventilated warehouse on CALATA VIGLIENA.

See also table headed "Moles, Quays and Jetties—Summary."

Facilities for Clearing Port Area

The Docks Railway System connects with the main railways.

Motor Trawlers.—There are at present about six motor trawlers of tonnage 10-120. The "Italia" is 118 ft. by 26 ft. by 10 ft., and the "Alessandra" 96 ft. by 26 ft. by 9 ft.

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See also table headed "Moles, Quays and Jetties—Summary."

Facilities for Clearing Port Area

The Docks Railway System connects with the main railways.

(3) **The Town**

For details see Sailing Directions and Plan 25.

(4) **Government Establishments**

Naval Dockyard

The Naval Dockyard is now used only as a Submarine Base. Fifteen Submarines are normally based here, and accommodation is available for 96 officers and between 400 and 500 men.

The equipment of the Base includes a newly-installed Training Tank for instruction in the use of the Davis Escape Apparatus. The workshops are capable of carrying out Submarine running repairs, but refitting cannot be undertaken.

Power is obtained from the City supply ; there is a project to instal an independent Power Plant as a reserve, but no definite decisions have as yet been taken.

The Government Dry Dock, 247 ft. long, is situated in the Naval Port. It is still in use for the docking of Submarines and Harbour Craft.

NAPLES 243**German Headquarters**

The Germans are reported to have established their Headquarters in a hotel on the North side of Piazza MUNICIPIO, immediately West of Via DEPRETIS, near the Naval Port.

Italian Marine Department Headquarters

These Headquarters are reported to be situated on Via S. LUCIA, North-West of and adjoining the "L" of LUCIA on Plan 25.

Hospitals and Barracks

As the Italians do not follow the usual conventions it is uncertain which of the following new constructions are hospitals. But as it is the practice to build barracks in the form of a "U," it is probable that of the following new buildings, those in the shape of a "U" are Barracks.

New Buildings believed to be Hospitals:—

- (1) Twenty-three large and six medium size rectangular buildings on the North side of the VIA REGGIA DI PORTICI, $\frac{3}{4}$ mile East of the PONTILE VIGLIENA. These buildings are completed.
- (2) Thirty-two rectangular buildings of which 22 have been completed, 1,000 yards North-East of (1). These were begun in February, 1941.
- (3) Ten large and ten small rectangular buildings on the North side of the village of SECONDIGLIANO.
- (4) Five large and one small rectangular buildings under construction between road and ravine approximately 750 yards North-West of Royal Palace at CAPODI-MONTE.

New Buildings believed to be Barracks:—

- (5) Eleven "U"-shaped buildings under construction approximately 2,000 yards South-East of (1). These were begun between April and July, 1941.
- (6) Twelve "U"-shaped buildings under construction approximately 500 yards North-East of (3).
- (7) Six "U"-shaped and three rectangular buildings under construction 500 yards North-East of (6).

(5) Commercial Establishments**Shipbuilding Yards**

A Company, called SOCIETA ANONIMA STABILIMENTI NAVALI E MECCANICI NAPOLETANI ("NAVALMECCANICA") has been formed at NAPLES with a capital of 60,000,000 lire.

It comprises:—

- (a) Officine Meccaniche Miani e Silvestri.
- (b) Ex-Pattison Yard.
- (c) Bacini e Scali Napoletani.
- (d) Ex-Naval Dockyard, CASTELLAMARE.

The three concerns first mentioned are described separately below.

At NAPLES

- (a) *Bacini e Scali Napoletani* (NAVALMECCANICA).—Shipbuilding Yard, Repair Shops, and Engineering Works, situated at the head of the Repairing Basin. Two Building Slips 492 ft. long. The firm operates two Dry Docks and a Hauling-up Slip; the number of men employed is 1,000.
- (b) *PATTISON Shipyard* (NAVALMECCANICA).—This Yard is now being reconstructed. The two existing Slips are to be completely demolished and in

These buildings are completed.

- (2) Thirty-two rectangular buildings of which 22 have been completed, 1,000 yards North-East of (1). These were begun in February, 1941.
- (3) Ten large and ten small rectangular buildings on the North side of the village of SECONDIGLIANO.
- (4) Five large and one small rectangular buildings under construction between road and ravine approximately 750 yards North-West of Royal Palace at CAPODI-MONTE.

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- (b) *PATTISON Shipyard (NAVALMECCANICA)*.—This Yard is now being reconstructed. The two existing Slips are to be completely demolished and in their place will be built two Slips of the semi-movable type which will be capable of building ships up to about 10,000 tons. It is expected that the reconstructed Yard will extend as far as VIGLIENA and will occupy an area of about 80,000 square yards. Arrangements will be included for the fitting out of ships after launching.
- (c) *Officine Meccaniche Miani Silvestri & A. Grondona, Comi & Co. (NAVALMECCANICA)*.—Large Marine Engine and Boiler and Locomotive making Works situated at SANT' ERASMO, close to Pattison's Yard. The total capacity of the four blast furnaces is 22 tons of cast iron per hour.
- (d) *Stabilimento Elettrico e Meccanico, Carmine di Luca*.—Works situated at SANT' ERASMO, close to Pattison's Yard. Castings are the principal product of the Works, and can be produced up to 15 tons in iron and 12 tons in bronze. Torpedo tubes, air compressors, etc., are made.
- (e) There is a small shipbuilding yard in the West corner of the Avamporto di LEVANTE: four Schooners under construction (1941).

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Coal Bunkering Facilities

At NAPLES

The average amount of Bunker Coal shipped at this Port is about 8,000 tons monthly.

Società Italo-Britannica Guerci (Coal Merchants).—Average number of tons kept in stock is about 2,000 ashore and about 200 afloat.

The method of coaling used is by baskets, and the normal bunkering rate is about 100 tons per hour.

The length of the Coaling Wharf is about 1,200 ft. This refers to the Pontile VITTORIO EMANUELE II which is a Government Wharf, spaces for Coal Stores are being leased out to firms for one year. The depth of water is 24 ft.

Coal Stocks

Coal is unloaded on to the PONTILE GIOVANNI BAUSAN and then conveyed by railway to a large coal dump on the CALATA GRANILI and also to a smaller dump at the base of the PONTILE VITTORIO EMANUELE II.

This latter dump appears to be used for the bunkering of shipping.

Seven dumps of coal are maintained in the area, two being situated approximately 370 yards North of the Public Swimming Bath.

Oil Storage

At NAPLES

Refinery—

The Raffineria di NAPOLI, which is controlled by the Sacony Vacuum Corporation, has an estimated annual output of 230,500 tons of petroleum products, details of which are given in Section V (3), sub. para. (3).

It is situated in the suburb of POGGIOREALE in position 050° 30', East end of San VINCENZO Mole, 3,500 yards.

Refinery Storage—

The Raffineria di NAPOLI is the second largest Refinery in the world. It has eight large reservoir tanks for the storage of crude oil and about 200 smaller tanks with a total storage capacity of 208,000 tons. These are situated adjacent to and South-West of the N.A.F.T.A. Storage Tanks in position 055° 30', East end of San VINCENZO Mole, 2,750 yards.

Other Commercial Storage—

S.I.A.P. Oil Storage Tanks are adjacent to and South-West of the refinery: there were eight large tanks and several smaller ones, of total capacity 27,000 tons.

Two of the medium tanks at the North end of the depôt have been destroyed.

On the South side of this depôt, building operations, which were commenced between January and July, 1941, have taken the shape of a supplementary depôt. A cooling tower is under construction and ground has been cleared for four tanks.

A.G.I.P. owns 14 Storage Tanks situated 054° 30', East end of San VINCENZO Mole 2,050 yards: their total capacity is 32,000 tons.

N.A.F.T.A. Oil Storage Tanks are situated 055° 30', East end of San VINCENZO Mole, 2,750 yards. The N.A.F.T.A. Tanks are connected by pipelines to the VIGLIENA Mole, the pipes running the length of the Mole which is 250 yards long and 100 yards wide. For fuelling

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The VIGLIENA Oiling Mole belongs to the Port Authorities: depth of water alongside is 30 ft.

The Societa Anonima Italia Importazione Olii (S.I.O.) owns 11 large and three smaller Tanks sited at the North-East end of the VIGLIENA Mole. These tanks are connected to the Mole by pipelines which run the length of the Mole. The total storage capacity of S.I.O. amounts to 9,000 tons.

Messrs. F. Garolla and Giacchetti hold average stocks of 2,500 tons of fuel oil, which is kept ashore.

The method of fuelling is by tank lighter at the rate of 500 tons per hour, the firm has six tankers with a capacity of about 400 tons each. Diesel oil is stocked.

Messrs. Volpicetti—a distributing firm which draws supplies from Societa Anonima Italia Importazione Olii.

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Oil Discharge Points

Tanks discharge at two points:—

- (i) At the CALATA POLLENA from which oil is pumped through a pipeline laid in an open ditch running parallel with the NAPLES-POMPEI AUTOSTRADA, to feed the following installations:—

REFINERY SOC. RAFFINERIA DI NAPOLI.

S.I.A.P. Oil Storage.

Nafta Oil Storage.

Oil Storage RAFFINERIA DI NAPOLI.

- (ii) At the PONTILE VIGLIENA from which oil is pumped to the SOC. ANON. ITALIA IMPORTAZIONE OILI.

Water

There is a supply of water available for drinking and boilers. Water is supplied by Port Hydrant and by Tanker in Port.

(6) Aircraft Factories

The works of the Industrie Meccaniche Ed Aeronautiche Meridionale is situated at the East end of the Town about 500 yards East of the PIAZZA SALERNO. It is a large establishment, 1,500 men being employed there. The general lay-out of the Works is good. The estimated output is 12 Aircraft per month. There is a small subsidiary Factory belonging to the above firm about half a mile to the South.

In March, 1939, the construction of a large Aircraft Factory near ACERRA, 10 miles North-East of NAPLES, was approved. It is reported that the Workshops would cover an area of about 1,000 acres.

The "S.A. Bacini e Scali Napoletani" undertake repairs to Aeroplanes.

A new Aeroplane Factory—the ALFA-ROMEO-CANTIERE—has been opened at POMIGLIANO D'ARCO (NAPLES). This factory and adjacent area have been heavily bombed.

The greater part of the factory is reported to be underground. There are two large hangars, one 480 ft. by 210 ft. and the other 450 ft. by 200 ft.

There are also numerous large workshops in the immediate vicinity, besides eight large buildings which may be barracks.

(7) Air Facilities

Aerodromes

- (i) *CAPODICHINO Aerodrome*

Prior to June, 1940, the landing area was approximately 1,280 by 1,230 yards. Work was then begun to extend the landing area on the North-East side. This has now been completed and the dimensions of this new extension are 880 by 325 yards.

Hangars

North-West side—four hangars.

South-East side—one double and one single hangar.

South-West side—one large repair hangar and one medium size hangar.

Workshops and Administrative Buildings

These are situated in the South-West and South-East corners of the aerodrome.

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Workshops and Administrative Buildings

These are situated in the South-West and South-East corners of the aerodrome.

W/T

A W/T Station is located in the South-East corner.

Defences

The landing ground is ringed by M.G. positions.

There are reported to be 600 cadets under instruction.

(ii) *POMIGLIANO D'ARCO Aerodrome*

A new Aerodrome is situated at POMIGLIANO D'ARCO, 8 miles North-East to Naples in position 40° 55' N., 14° 23' E.

The landing ground is circular in shape with a runway from North-East to South-West 2,000 yards long.

The Aerodrome is connected by road and rail to NAPLES.

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Seaplane Stations

(a) *The Air France Station.*—This Station is situated at the extremity of Molo CESAREO CONSOLE. There are two Hangars, one of which is small and the other is a modern building with a frontage of 70 yards. Use is being made of these hangars (1941). There is a Slipway and a Crane capable of lifting aircraft engines.

Air Services are maintained by the S.A.M.R. to ROME and TUNIS *via* PALERMO, and the Air France to the Far East. No facilities exist for repairs, except those of a minor nature.

(b) *Calata VIGLIENA.*—Four seaplanes have been seen in front of the workshops which are used for submarine repair work: it is probable that repairs of seaplanes are also carried out there.

(8) War Material Factories

The Royal Arsenal and Torpedo Factory are situated on the South side of the railway, three-quarters of a mile East of the Central Railway Station. The Arsenal is on the East and the Torpedo Factory on the West side of the main road that passes under the railway. The Arsenal produces guns of all calibre. The Torpedo Factory is reported to be the largest in Italy.

There is an Explosives Factory three-quarters of a mile to the East of VIA CAMANA. This establishment consists of a number of buildings, surrounded by a high wall with sides 250 yards long.

The extensive damage done by bombing between October and December, 1941, to the Royal Arsenal and to engineering plant within the industrial area must have considerably limited the industrial output from the Naples area.

(9) Power Plants*(a) Main Supply of Current*

The main source of electric current is *via* overhead high tension cables from the interior. These approach the City from a Northerly direction and enter a large building believed to be the Transforming Station situated 300 yards North of the PONTIE VIGLIENA.

(b) Local Stations

(i) A Main Steam Power Generating Station is situated on the quayside 300 yards East of Pontile VIGLIENA.

(ii) Another Power Station is situated on Calata PORTA di MASSA.

(iii) A large Gasworks is situated approximately 600 yards North of the Pontile VITTORIO EMANUELE II. It possesses two large and four medium wet type gasometers, a large retort house and coal bunkers. The coal is fed to the retort house by means of a gantry.

One of the large gasometers has been badly damaged and rendered unserviceable.

A by-products plant adjoins the gasworks on the East side and is to be distinguished by its coke bunkers, a chimney and two tanks. Further confirmation of this is shown by the erection since January, 1941, of two conveyors from the gasworks to open ground beside the plant.

(iv) Another factory with large coal or coke stocks is situated just North of the gasworks. All these installations have rail communications.

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(iv) Another factory with large coal or coke stocks is situated just North of the gasworks. All these installations have rail communications.

Gas Works.

Gas works are situated south of the large marshalling yards and 600 yards North of coaling harbour.

(10) Transport Facilities

Railways

The following are the principal Railways from NAPLES:—

- (i) Double line Southward to SALERNO, where connection is made to BRINDISI and TARANTO. This line runs along the coast as far as CASTELLAMARE di STABIA.
- (ii) Double line to ROME *via* CASERTA, which runs inland from NAPLES.

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- (iii) New direct line to ROME *via* GAETA. It has numerous vulnerable points for first 60 miles—many tunnels and high embankments visible from seaward and within easy gun range.

The Central Station of NAPLES is at the Eastern extremity of the City.

- (iv) The railway terminates on the CALATA BEVERELLO, from here lines run on to the MOLO LUIGI RAZZA on both sides and in to the MARITTIMA Station on the Mole. A line crosses the end of the Mole and is linked to the other lines by means of three turntables; one at each end and one in the centre. Trucks are shunted individually on to this line.

The lines from the Mole run Eastward alongside the quay diverging into three lines on the CALATA PORTA DI MASSA to serve the warehouses. They then continue along the quays to about the middle of the CALATA DELLA MARINELLA where they branch to the goods depôt East of the Town, a line continuing to sidings on the CALATA V VENETO and CALATA POLLENA. Branch lines run to the following moles:—

MOLO CARLO PISACANE, one line along West side.

MOLO DEL CARMINE, one line along West side, three lines down centre, with a branch line from them to the East side.

MOLO CESARIO CONSOLE, along East side.

PONTILE VITTORIO EMANUELE II, on both sides of warehouses on the East side and also on the West side.

PONTILE DUCHESSA ELENA D'AOSTA, both sides.

PONTILE GIOVANNI BAUSAN, both sides.

Since January two new marshalling yards have been added to the system. The largest adjoins the old marshalling yard on its East side and the smallest is built on the inside of the bend in the lines to ROME, about three-quarters of a mile North of the depôt.

It is to be noted that a large increase in traffic has resulted since the installation of the new marshalling yards.

- (v) The Railway Depôt is easily identified from the air by its triangular appearance. This formation is caused by the divergence of the lines to ROME and CASTELLAMARE DI STABIA with a base to the East made by a large marshalling yard. In the centre of the triangle are two large semi-circular engine sheds linked by a large building which is probably a workshop.

Two turntables, two water towers and coal stocks complete the triangle. Other sheds are on the North side of the triangle.

(11) Signal Communications

W/T Station

A W/T Station is situated at the end of the SAN VINCENZO Mole. Two masts are placed approximately 420 ft. apart, the furthest from the shore being approximately 325 ft. from the end of the Mole.

The Station is built into the Mole and is placed between the masts.

A W/T Station is reported in South-East corner of CAPO-DI-CHINO Aerodrome, consisting of three masts in triangular form with two long buildings in between.

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Submarine Cables

There are two cables to PALERMO. See "Submarine Telegraph Cables in the Mediterranean." (C.B. Series.)

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(12) Defences

The Defence Scheme includes the Northern Approaches to the PROCIDA Channel, Isola d'ISCHIA, POZZUOLI Bay, The Gulf of NAPLES, CASTELLAMARE di STABIA and Isola di CAPRI.

(1) Sea Front Defences

(a) Coast Defence Batteries

Battery No.	Position.	Armament.	Grading.		Date of Latest Report.
			Position and No. of Guns.	Calibre.	
1	Monte CUMA	? No. and calibre	B.2	—	1942
2	Lago AVERNO—Sited on the ridge to West of the lake: Lat. 40° 50' 26" N., Long. 14° 3' 50" E.	4—? calibre ..	B.2	—	1942
3	Porto d'ISCHIA	? 7—? calibre (small).	B.2	—	1940
4	Isola d'ISCHIA (position unknown) ..	? No. and calibre P.D.	B.2	—	1940
5	Isola d'ISCHIA, Monte CAMPAGNANO	? No. and calibre	B.2	—	1940
6	Isola di PROCIDA (? on Punta SOCLARO)	? No. and calibre	B.2	—	1940
7	Capo MISENO—Sited on the lower part of the cliffs, at the extreme end of the cape, each mounted below the other.	4—? 8-in. ..	B.2	B.3	1940
8	Capo MISENO—Sited 525 yards North of the cape.	3—? calibre (small).	B.2	—	1942
9	Isola di NISIDA—Sited on the West side of the Northern claw.	2—? calibre (emplacements only)	B.2	—	1942
10	Isola di NISIDA—Sited about 80 yards inland from the Southern extremity.	4—4.5-in. or 6-in.	B.2	B.3	1941
11	POSILLIPO S. STRATO—On the Southern slopes of the hill.	4—8-in. (or larger)	B.2	B.3	1941
12	Capo di POSILLIPO	1—11-in. ..	B.2	B.3	1940
13	Forte del OVO (P.A.)	4 or 5—8-in. (or larger).	B.2	B.3	1941
14	CASTELLAMARE di STABIA—Sited on the outer arm of the Western breakwater.	4—3-in. ..	B.2	B.2	1940
14A	IL DESERTA—Hill 1493	4—? calibre ..	A.2	—	1942
15	Isola di CAPRI: CAPO TIBERIO—Sited on the Eastern slopes of Hill 1115, South of the Cape. (P.A.)	4—4.1-in. ..	B.2	B.3	1941
16	Isola di CAPRI: Punta MASULLO ..	? No.—? 4.1-in.	B.2	B.3	1941
17	Isola di CAPRI: North of Punta di TRAGARA, on South-Eastern slope of Hill 896.	3—? calibre not larger than 10-in.	B.3	B.5	1941
18	Isola di CAPRI: Punta di PINO ..	3—? calibre not larger than 10-in.	B.3	B.5	1941
19	Isola di CAPRI: Torre DAMECUTA ..	3—6-in. ..	B.2	B.3	1941

1	Monte CUMA	..	..	..	..	1942
2	Lago AVERNO—Sited on the ridge to West of the lake: Lat. 40° 50' 26" N., Long. 14° 3' 50" E.	..	..	..	..	1942
3	Porto d'ISCHIA	..	..	..	..	1940
4	Isola d'ISCHIA (position unknown) ..	..	..	..	..	1940
5	Isola d'ISCHIA, Monte CAMPAGNANO	..	..	..	..	1940
6	Isola di PROCIDA (? on Punta SOC- CIARO)	..	..	..	..	1940
7	Capo MISENO—Sited on the lower part of the cliffs, at the extreme end of the cape, each mounted below the other.	..	..	..	..	1940
8	Capo MISENO—Sited 525 yards North of the cape.	..	..	..	..	1942
9	Isola di NISIDA—Sited on the West side of the Northern claw.	..	..	..	..	1942
10	Isola di NISIDA—Sited about 80 yards inland from the Southern extremity.	..	..	..	..	1941
11	POSILLIPO S. STRATO—On the Southern slopes of the hill.	..	..	..	..	1941
12	Capo di POSILLIPO	..	..	..	..	1940
13	Forte del'OVO (P.A.)	..	..	..	..	1941
14	CASTELLAMARE di STABIA—Sited on the outer arm of the Western breakwater.	..	..	..	..	1940
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18	Isola di CAPRI: Punta di PINO ..	..	..	..	..	1941
19	Isola di CAPRI: Torre DAMECUTA	..	..	..	..	1941
20	Isola di CAPRI—On the Northern slopes of Castle Hill.	..	..	..	..	1941

Mobile Batteries

There are two Machine Gun positions on the causeway connecting NISIDA Island with the mainland and three at the Eastern end of Diga FORANEA DUCA d'AOSTA.

Local Seaward Defences

(a) *Minefields*.—Mines have been laid in the Gulf of Naples.

Three minefields are reported extending half a mile each side of lines joining

A. 40° 42' 30" N.: 13° 59' 22" E. to 40° 38' 30" N.: 13° 59' 22" E.

B. 40° 41' 16" N.: 14° 03' 00" E. to 40° 37' 14" N.: 14° 08' 30" E.

C. 40° 39' 15" N.: 14° 12' 25" E. to 40° 33' 40" N.: 14° 12' 25" E. (Graded D.O.)

NAPLES 249

(b) *Booms and Net Defences.* (A.2, 1941)

The booms consist of iron cylinders connected by iron links with A/S nets suspended from them.

Important Naval and Mercantile units and points in the harbour vulnerable to torpedo attack are protected by A/T nets.

Such nets exist in the Naval and Commercial Ports and are placed around vessels moored to the San VINCENZO and other moles.

The Harbour entrances are protected as follows:—

(i) Entrance between Molo San VINCENZO and Antemurale THAON de REVAL.

The boom extends Northwards from a point 60 ft. from the Eastern end of Molo San VINCENZO for a distance of 60 ft. Thence it turns to 060 degrees for a distance of 450 ft., where there is a gate 390 ft. wide, which opens outwards and southwards and secures to a boom vessel. At the North-Eastern side of the gate the boom continues in the same direction for a distance of 225 ft., where it turns to 110 degrees and is secured to the Antemurale THAON de REVAL at a point 380 ft. from its Western end.

(ii) Entrance between Molo San VINCENZO and Diga DUCA degli ABRUZZI.

There is a boom between the Eastern end of Molo San VINCENZO and the West-North-Western end of Diga DUCA degli ABRUZZI, length, 180 ft.

(iii) Entrance between Diga FORANEA EMANUELE FILIBERTO DUCA d'AOSTA and Pontile VIGLIENA.

There are two booms.

(a) The inner single-line boom extends from the Southern extremity of the Pontile VIGLIENA in a direction 200 degrees for a distance of 390 ft. At that point there is a gate 345 ft. wide, which opens outwards and southwards, after which the boom continues in the direction of 200 degrees until it meets the Diga FORANEA EMANUELE FILIBERTO DUCA d'AOSTA at a point 1,690 ft. from the East-South-Eastern end of that Diga.

(b) The outer double-line boom extends at right angles to the Pontile VIGLIENA from a point which is situated 420 ft. from the Southern extremity of the Pontile VIGLIENA, on the Eastern side of the pontile, for a distance of 450 ft.; after which it turns Southwards in a direction 160 degrees for a distance of 340 ft.; it then turns parallel with the pontile for a distance of 515 ft. At this point the gate, which is 450 ft. wide, and opens inwards and southwards, is situated. After that the boom continues parallel with the inner boom and is secured to the Diga FORANEA EMANUELE FILIBERTO DUCA d'AOSTA at a point 1,115 ft. from the Eastern extremity of the diga.

(v) *Local Air Defences*(a) *Anti-Aircraft Batteries*

It is probable that a number of these batteries are mobile.

Battery.	Position.	Armament.	Grading.	Date of Latest Report.
A.A.1	Capo MISENO—Sited North of the Light-house	4—4 7-in.	B.2	1940
A.A.2	North of Lago MISENO—Sited on the	6—7 calibre	B.2	1942

the gate the boom continues in the same direction for a distance of 225 ft., where it turns to 110 degrees and is secured to the Antemurale THAON de REVAL at a point 380 ft. from its Western end.

(ii) Entrance between Molo San VINCENZO and Diga DUCA degli ABRUZZI.

There is a boom between the Eastern end of Molo San VINCENZO and the West-North-Western end of Diga DUCA degli ABRUZZI; length, 180 ft.

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(v) Local Air Defences

(a) Anti-Aircraft Batteries

It is probable that a number of these batteries are mobile.

Battery.	Position.	Armament.	Grading.	Date of Latest Report.
A.A.1	Capo MISENO—Sited North of the Light-house.	4—4.7-in.	B.2	1940
A.A.2	North of Lago MISENO—Sited on the South-Eastern slopes of BELVEDERE Hill, 1,185 yards North-West of Punta PENNATA.	6—? calibre	B.2	1942
A.A.3	POZZUOLI—Sited on the Molo ANSALDO.	4—3-in.	B.2	1940
A.A.4	LIGNAS NICOLA—Sited on a hill 1,400 yards North of centre of Ippodrome di AGNANO.	4—? calibre	B.2	1942
A.A.5	BAGNOLI Town. (P.A.)	? 4—3-in.	B.2	1940
A.A.6	BAGNOLI—About 700 yards South-East from BAGNOLI, by the roadside.	4—? calibre	B.2	1942
A.A.7	COROGGIO—(P.A.) by the roadside.	4—? calibre	B.2	1942
A.A.8	NISIDA Island—(P.A.)	4—? 3 in.	B.2	1940
A.A.9	NISIDA Causeway: two A.A. batteries	4—? calibre	B.2	1942
A.A.10 }	sited on the headland on the mainland at the root of the causeway.	4—? calibre	B.2	1942

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Anti-Aircraft Batteries—continued.

Battery	Position	Armament	Grading	Date of Latest Report
A.A. 11	NISIDA Causeway: sited on or near Hill 153, 400 yards South-East of root of NISIDA Causeway.	? No. and calibre ..	B.2	1941
A.A. 12	Monte COROGLIO: sited on or near Hill 142	? No. and calibre (heavy) ..	B.2	1941
A.A. 13	POSILLIPO oS. STRATO: sited about 600 yards South-West of the village near cross-roads.	4—? calibre (heavy) ..	B.2	1941
A.A. 14	POSILLIPO oS. STRATO: sited about 400 yards West of the village on or near Hill 100.	4—? calibre (heavy) ..	B.2	1941
A.A. 15	POSILLIPO oS. STRATO: sited immediately North of the village on or near Hill 159.	4—? calibre (heavy) ..	B.2	1941
A.A. 16	CASTELLANO: sited on or near Hill 166, 660 yards North-East of POSILLIPO oS. STRATO.	4—? calibre (heavy) ..	B.2	1941
A.A. 17	VILLANOVA: sited 450 yards South-West of the village on or near Hill 178.	4—? calibre (heavy) ..	B.2	1942
A.A. 18	VILLANOVA: sited about 700 yards North-West of the village near tunnel entrance.	4—? calibre (heavy) ..	B.2	1942
A.A. 19	VILLANOVA: sited on or near Hill 173	4—? calibre ..	B.2	1942
A.A. 20	RUSSO: 250 yards North-East of VILLANOVA.	4—? calibre ..	B.2	1942
A.A. 21	Via QUERCIA: sited near the shore	4—? calibre ..	B.2	1941
A.A. 22	POSILLIPO: sited on or near Hill 157	4—? calibre ..	B.2	1942
A.A. 23	SANNAZZARO: sited near the shore	4—? calibre ..	B.2	1942
A.A. 24	Sited on the tunnel	Emplacements under construction.	B.2	1942
A.A. 25	Castel ST. ELMO	? No. and calibre (light)	B.2	1941
A.A. 25A	NAPLES: Piazza LEONARDO: sited on the roof of a building.	4—2-in. (or smaller) ..	A.3	1942
A.A. 26	Castel Dell'OVO: sited North of the Fort in front of the Quartiere PIZZA FALCONE.	4—? calibre (heavy) ..	B.2	1941
A.A. 26A	NAPLES: at junction of Via ARM DIAZ—Via ROMA.	? No.—2-in. (or smaller)	A.2	1942
A.A. 27	NAPLES Port: sited on San VINCENZO Mole near the dry dock.	? 1—? calibre ..	B.2	1941
A.A. 28	CASTEL NUOVO	2—? calibre (light) ..	B.2	1941
A.A. 29	CAPODIMONTE: sited near the ROYAL PALACE.	2—? calibre ..	C.2	1941
A.A. 30	BOTANICAL GARDENS	4—? calibre ..	B.2	1941
A.A. 31	CAMPOSANTO di POGGIOREALE: sited North of the camp.	4—? calibre (light) ..	B.2	1941
A.A. 32	REFINERY: 1,450 yards to North-West of centre of the plant, near junction of road and railway.	4—? calibre (light) ..	B.2	1941
A.A. 33	REFINERY: 1,100 yards North of centre of the plant.	4—? calibre (light) ..	B.2	1941
A.A. 34	REFINERY: 1,600 yards to North-East of centre of the plant.	4—? calibre ..	B.2	1941
A.A. 35	REFINERY: 2,000 yards to North-East of centre of the plant.	4—? calibre ..	B.2	1941
A.A. 35A	South of CARAVITA village: 3 miles 070° from Central Railway Station.	4—3-in. (or larger) ..	A.2	1942
A.A. 36	REFINERY: 600 yards to North-East of centre of the plant.	3—? calibre ..	B.2	1941

A.A.16	unusually North of the village on or near Hill 159.	4—? calibre (heavy) ..	B.2	1941
A.A.17	CASTELLANO: sited on or near Hill 166, 660 yards North-East of POSILLIPO OS STRATO.	4—? calibre (heavy) ..	B.2	1942
A.A.18	VILLANOVA: sited 450 yards South-West of the village on or near Hill 178.	4—? calibre (heavy) ..	B.2	1942
A.A.19	VILLANOVA: sited about 700 yards North-West of the village near tunnel entrance.	4—? calibre ..	B.2	1942
A.A.20	VILLANOVA: sited on or near Hill 173	4—? calibre ..	B.2	1942
A.A.21	RUSSO: 250 yards North-East of VILLANOVA.	4—? calibre ..	B.2	1941
A.A.22	Via QUERCIA: sited near the shore ..	4—? calibre ..	B.2	1942
A.A.23	POSILLIPO: sited on or near Hill 157	4—? calibre ..	B.2	1942
A.A.24	SANNAZZARO: sited near the shore ..	4—? calibre ..	B.2	1942
A.A.25	Sited on the tunnel ..	Emplacements under construction.	B.2	1942
A.A.25A	Castel ST. ELMO	? No. and calibre (light)	B.2	1941
A.A.26	NAPLES: Piazza LEONARDO: sited on the roof of a building.	4—2-in. (or smaller) ..	A.3	1942
A.A.26A	Castel Dell'OVO: sited North of the Fort in front of the Quartiere PIZZA FALCONE.	4—? calibre (heavy) ..	B.2	1941
A.A.27	NAPLES: at junction of Via ARM DIAZ—Via ROMA.	? No.—2-in. (or smaller)	A.2	1942
A.A.28	NAPLES Port: sited on San VINCENZO Mole near the dry dock.	? 1—? calibre	B.2	1941
A.A.29	CASTEL NUOVO: sited near the CAPODIMONTE	2—? calibre (light) ..	B.2	1941
A.A.30	ROYAL PALACE	2—? calibre ..	C.2	1941
A.A.31	BOTANICAL GARDENS	4—? calibre ..	B.2	1941
A.A.32	CAMPOSANTO di POGGIOREALE: sited North of the camp.	4—? calibre (light) ..	B.2	1941
A.A.33	REFINERY: 1,450 yards to North-West of centre of the plant, near junction of road and railway.	4—? calibre (light) ..	B.2	1941
A.A.34	REFINERY: 1,100 yards North of centre of the plant.	4—? calibre ..	B.2	1941
A.A.35	REFINERY: 1,600 yards to North-East of centre of the plant.	4—? calibre ..	B.2	1941
A.A.35A	REFINERY: 2,000 yards to North-East of centre of the plant.	4—? calibre ..	B.2	1942
A.A.36	South of CARAVITA village: 3 miles 070° from Central Railway Station.	4—3-in. (or larger) ..	A.2	1941
A.A.37	REFINERY: 600 yards to North-East of centre of the plant.	3—? calibre ..	B.2	1941
A.A.38	Pontile VITTORIO EMANUELE ..	4—? calibre ..	B.2	1941
A.A.38A	Calato VITTORIO VENETO: sited between railway sidings and warehouses.	4—? calibre ..	B.2	1941
A.A.39	GRANILI Barracks: Lat 40° 50' 30" N., Long. 14° 17' 20" E.: sited on the roof.	3—2-in. (or smaller) ..	A.2	1942
A.A.40	Calata VIGIENA: to the North-East of GRANILI Barracks.	? No. and calibre ..	B.2	1941
A.A.40A	SAN GIOVANNI a TEDUCCIO ..	6—? calibre (heavy) ..	B.2	1941
A.A.41	PORTICI: Lat. 40° 48' 50" N., Long. 14° 20' 03" E.: on the coast.	4—? calibre (3-in. or larger).	A.2	1942
	CASTELLAMARE di STABIA: in a hut on the quay, to the North-East of Molo di LEVANTE (behind this hut there is a small building labelled A.A. Headquarters).	1—3-in. ..	B.2	1940

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Anti-Aircraft Batteries—continued.

Battery	Position	Armaments	Grading	Date
A.A.41A	CASTELLAMARE di STABIA: 2,700 yards North-East of the harbour.	4—3-in. (or larger)	A.2	1942
A.A.42	CASTELLAMARE di STABIA: sited on the Molo di PONENTE. (P.A.)	3—? calibre (small)	B.2	1940
A.A.43	Punta CAMPANELLA	? No. and calibre	B.2	1940
A.A.44	Isola di CAPRI: midway between Lo CAPO (Capo TIBERIO) and Punta del MONACO.	4—3.5-in.	B.2	1941
A.A.45	Isola di CAPRI: Punta MASULLO, sited North-West of the point on the South-Eastern slopes of the range of hills running North-East-South-West.	4—3-in.	B.2	1941
A.A.46	Isola di CAPRI: CAPRI Town: sited on the hills to the East of the town, South of point 804.	5—3.5-in.	B.2	1941
A.A.47	Isola di CAPRI: Punta VENTROSO: sited on the cliffs 1,200 yards West of the point.	5—3.5-in.	B.2	1942
A.A.48	Isola di CAPRI: Torre DAMECUTA: sited on Hill 495.	(a) 4—3.6-in. (b) ? 9—A.A./M.G.s.	B.2	1942
A.A.49	Isola di CAPRI: Punta CANTONE	5—3-in.	B.2	1942
A.A.50	Isola di CAPRI: ANACAPRI: sited on CASTLE Hill, East-North-East of the village.	3—3.5-in. and 3 A.A./M.G.s.	B.2	1941

Mobile A.A. Batteries

A.A. machine guns have been sited one in PIAZZA G. BOVIO and three in Calata della MARINELLA.

The A.A. defences are reported to have been strengthened by German A.A. Batteries, manned by Germans and sited at the entrance to the Commercial Port: probably mobile.

There are also a number of Bofors guns in the Town and Port area of NAPLES (B.2, 1942).

Balloon Barrage

A Balloon Barrage is in position round the North-East bed of the Harbour.

Smoke Screen

A Smoke Screen, which covers the Harbour and part of the Town, is released as part of the A.A. defence of Naples.

Notes on Efficiency of A.A. Defences

In June, 1942, fire from Heavy A.A. Batteries was described as "erratic and not very intense." Light A.A. was occupied firing at flares. Smoke Screen late in starting but eventually covered the Harbour effectively. Searchlights, 17 in action—no illuminations.

NAPLES—ENVIRONS

(Including BAGNOLI AND NISIDA ISLAND, POZZUOLI, BAIA, PORT MISENO and TORRE ANNUNZIATA)

A.A.46	hills running North-East-South-West. Isola di CAPRI: CAPRI Town: sited on the hills to the East of the town. South of point 804.	5-3-5-in.	B.2	1941
A.A.47	Isola di CAPRI: Punta VENTROSO: sited on the cliffs 1,200 yards West of the point.	5-3-5-in.	B.2	1942
A.A.48	Isola di CAPRI: Torre DAMECUTA: sited on Hill 495.	(a) 4-3-6-in. (b) 9-A.A./M.G.s.	B.2	1942
A.A.49	Isola di CAPRI: Punta CANTONE	5-3-in.	B.2	1942
A.A.50	Isola di CAPRI: ANACAPRI: sited on CASTLE Hill, East-North-East of the village.	3-3-5-in. and 3 A.A./M.G.s.	B.2	1941

Mobile A.A. Batteries

A.A. machine guns have been sited one in PIAZZA G. BOVIO and three in Calata della MARINELLA.

The A.A. defences are reported to have been strengthened by German A.A. Batteries, manned by Germans and sited at the entrance to the Commercial Port: probably mobile.

There are also a number of Bofors guns in the Town and Port area of NAPLES (B.2, 1942).

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NAPLES—ENVIRONS

(Including BAGNOLI AND NISIDA ISLAND, POZZUOLI, BAIA, PORT MISENO and TORRE ANNUNZIATA)

General

The towns on the outskirts of Naples are linked by an electric and a steam railway, the locations of the NAPLES termini is uncertain but one terminus, probably that of the steam railway, adjoins the Central Station on the West side.

The railways make their first appearance about one mile South-West of S. ELMO Castle where they emerge from a tunnel beneath the castle, which is a standard gauge private electric line 20 kms. long with 16 stations.

The electric railway is on the North side of the steam railway and they both enter tunnels beneath the mountainous coastal ridge to BAGNOLI. The NAPLES terminus "NAPOLI MONTE SANTO" is 1½ kms. West of the Main Line Central Station.

There are stations for both railways on the East side of the ridge.

At BAGNOLI, the electric railway goes underground again just West of the Station where it surfaces.

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The steam railway curves Westwards at the North-East corner of the ILVA Iron Works, crossing the electric railway which passes through the town to follow the coastline. The steam railway, which is a section of the Main ROME-NAPLES Line (which also has electric traction 300 v.d.c.), runs on to POZZUOLI where it curves off in a North-North-Westerly direction. The electric railway follows the coastline to BAIA where it curves off through the coastal ridge in a Westerly direction, terminating at TORRE GAVETTA on the West Coast.

In addition to these two railways there is also an Electric Tramway from NAPLES, through BAGNOLI to POZZUOLI. This line runs South of the two railway lines.

BAGNOLI AND NISIDA ISLAND

(Lat. 40° 47' 55" N., Long. 14° 09' 52" E.)

(See Admiralty Chart No. 1728)

(1) General Remarks

BAGNOLI and NISIDA Island are situated on the Eastern side of POZZUOLI Bay: BAGNOLI lies in the wide valley between the mountainous coastal ridge on the West side of NAPLES Bay and the mountain ridge running from the North-East of NAPLES to POZZUOLI. BAGNOLI is of interest on account of the location there of large steel works. To the Southward of NISIDA Island, connected to the shore by a breakwater, is a Seaplane Station.

There is no rail or tramway, only road connection, between the Island and the mainland.

Anchorage

There is anchorage, as convenient, clear of dangers, off the beach between BAGNOLI and NISIDA Island; the bottom is sand and is good holding ground. Depths decrease gradually towards the shore.

Conspicuous Objects

The most conspicuous objects in the neighbourhood are the Island of NISIDA itself, and the cranes on the ILVA Steel Works pier.

Tides, Currents and Weather

It is dangerous to remain alongside the piers with winds from South-East through South to West-North-West. North- and South-Westerly winds send a certain amount of sea into the anchorage.

(2) Port Facilities***Description of Harbour***

There is no protected harbour although the anchorage is sheltered somewhat by the Mole and Breakwater linking NISIDA Island to the Mainland.

Mooring Buoys

There are a number of mooring buoys for securing lighters on the North-East side of NISIDA Island, and others off the piers and moles.

Quayage and Craneage

Pontile ILVA.—Situated 4 cables South-Eastward of BAGNOLI, length 1,300 ft., is accessible to vessels drawing up to 24 ft. It is equipped with four travelling gantries which run from the North side of the Steel Works. Water is laid on to this pier.

Molo CAPPELLINI.—Extends North-Eastward from the Eastern side of NISIDA Island: length 1,300 ft., depth of water alongside, 24 fathoms. There are eight large cranes and three sheerlegs on the mole. A breakwater, 900 ft. long, connects the head of the mole to the mainland.

BAGNOLI and NISIDA Island are situated on the Eastern side of POZZUOLI Bay : BAGNOLI lies in the wide valley between the mountainous coastal ridge on the West side of NAPLES Bay and the mountain ridge running from the North-East of NAPLES to POZZUOLI. BAGNOLI is of interest on account of the location there of large steel works. To the Southward of NISIDA Island, connected to the shore by a breakwater, is a Seaplane Station. There is no rail or tramway, only road connection, between the Island and the mainland.

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Pontile ILVA.—Situated 4 cables South-Eastward of BAGNOLI, length 1,300 ft., is accessible to vessels drawing up to 24 ft. It is equipped with four travelling gantries which run from the North side of the Steel Works. Water is laid on to this pier.

Molo CAPPELLINI.—Extends North-Eastward from the Eastern side of NISIDA Island : length 1,300 ft., depth of water alongside, 2½ fathoms. There are eight large cranes and three sheerlegs on the mole. A breakwater, 900 ft. long, connects the head of the mole to the mainland.

Pier.—A pier extends West-South-Westward from the shore about 1½ cables Southward of the Pontile ILVA : length 530 ft. ; it is accessible to vessels drawing not more than 12 ft.

Boats' Landing Place.—A wooden landing place, 300 ft. long, extends from the shore a little Southward of the Pier ; it is only accessible to boats.

Porto PAONE.—Situated on the South-West side of NISIDA Island is a small natural harbour, circular in shape, of diameter about 600 ft. ; width at entrance 200 ft. ; depths of 5½ fathoms in the entrance channel decreasing rapidly within. Its shore are high and rocky.

Trade

Imports.—Coal, Iron and manganese ores, limestone, phosphates, and scrap-iron.

Exports.—Cast iron, iron and steel billets, iron plates, chemical manures, sulphate of copper and cement.

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BAGNOLI

Estimated Daily Capacity

	Tons
* Pontile ILVA—three vessels at 400 tons	1,200
* Molo CAPPELLINI—two vessels at 400 tons	800
Discharging to lighters for unloading at pier—one vessel	200
* Suitable for loading M/T.	2,200

Harbour Craft

A number of tugs and lighters are available.

Facilities for Clearing the Port Area

A large Marshalling Yard and Railway Depot occupy an important position in the centre of the valley.

The Railway Depot is situated 240 yards East of the Steel Works and has an Engine Shed 205 ft. by 195 ft. and a Repair Shed 235 ft. by 105 ft. Sidings of recent construction are situated on its South side.

Five hundred yards North-East of the Depot is the large Marshalling Yard, which has good warehouse facilities and a station on its North side.

Branch lines run to the Steel Works, where there is a large network, and from there on to the South mole.

The Electric Railway Station is of circular construction, the platforms being underground, it is situated about 270 yards North of the Steam Railway Station.

A Cable Conveyor is under construction between the coastal ridge and the Electric Railway. The termini are situated in the following positions:—

1. On ridge at bend in road about 650 yards South of Cavalry Barracks.
2. Approx. 170 yards North of railway between the Railway Depot and Marshalling Yard.

This latter overhangs the Electric Railway and it is probably intended to use this railway to clear whatever goods or material that are brought across from the ridge.

Three tall concrete pylons have been erected; one on each side of the railway and one about 500 yards South of the railway.

(3) The Town

The town of BAGNOLI: population 7,000, is sited along the beach about 2½ miles Eastward of the head of POZZUOLI Mole. There are hot mineral springs.

(4) Government Establishments

Barracks

(i) *Cavalry Barracks*.—Large Barracks are situated 750 yards North of the Steel Works; these Barracks occupy about 75 acres. There are five large and one medium "U"-shaped buildings (buildings of that shape are normally barracks), and a complement of smaller rectangular buildings. These barracks are for cavalry. On their East side there are two exercise grounds with hurdles.

(ii) Other Cavalry Barracks are sited on the East side of the Steel Works enclosed in an area of 1,180 ft. by 1,060 ft. On the Eastern side of that is a Rifle Range. South of the Steel Works there is an oval-shaped area which is used as a training ground for cavalry; there are a large number of trenches dug in it; it could not therefore be used by aircraft.

The Railway Depot is situated 240 yards East of the Steel Works and has an Engine Shed 205 ft. by 195 ft. and a Repair Shed 235 ft. by 105 ft. Sidings of recent construction are situated on its South side.

Five hundred yards North-East of the Depot is the large Marshalling Yard, which has good warehouse facilities and a station on its North side.

Branch lines run to the Steel Works, where there is a large network, and from there on to the South mole.

The Electric Railway Station is of circular construction, the platforms being underground, it is situated about 270 yards North of the Steam Railway Station.

A Cable Conveyor is under construction between the coastal ridge and the Electric Railway. The termini are situated in the following positions:—

1. On ridge at bend in road about 650 yards South of Cavalry Barracks.
2. Approx. 170 yards North of railway between the Railway Depot and Marshalling Yard.

This latter overhangs the Electric Railway and it is probably intended to use this railway to clear whatever goods or material that are brought across from the ridge.

Three tall concrete pylons have been erected; one on each side of the railway and one about 500 yards South of the railway.

(3) The Town

The town of BAGNOLI: population 7,000, is sited along the beach about 2½ miles Eastward of the head of POZZUOLI Mole. There are hot mineral springs.

(4) Government Establishments

Barracks

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(ii) *Other Cavalry Barracks* are sited on the East side of the Steel Works enclosed in an area of 1,180 ft. by 1,060 ft. On the Eastern side of that is a Rifle Range. South of the Steel Works there is an oval-shaped area which is used as a training ground for cavalry; there are a large number of trenches dug in it; it could not therefore be used by aircraft.

Other Buildings

About 1¼ miles East-North-East of the Steel Works there are in process of erection 13 rectangular buildings 135 ft. by 30 ft.

(5) Commercial Establishments

Ilva Iron and Steel Works

These Works, owned by the Trust "Alti Forni e Acciaiere d'Italia", are sited at the mouth of the valley. This plant covers an area of about 2,480 acres. On the North side of the works are extensive coal and coke bunkers. These are supplied from the four travelling gantries on the North Mole which run the whole length of the bunkerage.

Two further gantries, operating in the bunkerage area only, feed the hot air stoves adjoining the bunkers, and the gas works in the North-West corner of the plant.

Coal is fed into the retort house of the Gas Works, coke is drawn off, and bunkered near the hot air stoves.

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POZZUOLI

This is used again in the stoves and hot air is pumped through a pipe to the blast furnaces at the North end of the rolling mills, which occupy a central position in the plant. Iron ore is conveyed by rail and is dumped between the hot air stoves and blast furnaces.

Slag is deposited over a wide area South of the rolling mills.

At the Gas Works are two wet type gasholders, 115 ft. and 145 ft. in diameter, and a group of separation cylinders for by-products.

A subsidiary plant is situated in the South-West corner but its operation in conjunction with the Steel Works is obscure.

(7) Air Facilities

NISIDA Seaplane Base

This is situated on the North-East side of the Island, in position Lat. 40° 40' N., Long. 14° 10' E.; it has a water frontage of 400 yards.

The Seaplane Hangar is about 290 by 85 ft. and on each side there is a building 160 ft. by 55 ft. These are probably used as workshops.

There is a crane for handling the Seaplanes, a concrete Slipway 100 ft. broad in front of the hangar, a pontoon and moorings.

There are two moles jutting out from the Island; one 630 ft. on the North side, at the Western end of the Seaplane Station, and the other on the East side, Molo CAPPELLINI, extends to the Mainland.

(10) Transport Facilities

BAGNOLI is on the Main Coastal Road and Railway. (See also paragraph (2) PORT FACILITIES—Facilities for Clearing the Port Area.)

NISIDA Island is connected to the Mainland by road only.

(12) Defences

The Coast Defences and Anti-Aircraft Batteries are included in the report on NAPLES, which see.

POZZUOLI

(Lat. 40° 49' 18" N., Long. 14° 07' 20" E.)

(See Admiralty Chart No. 1400)

(1) General Remarks

POZZUOLI is situated in about the centre of the North Shore of POZZUOLI Bay.

The main interest in this port lies in the fact that at POZZUOLI are the Ordnance and Steel Works of SILURIFICO ITALIANO, and one of the Main Storages for heavy oil for the use of the Italian Fleet.

Anchorage

There is anchorage off the Harbour; the bottom is mud and the holding ground is good.

Conspicuous Objects

There is a conspicuous Church with a dark cupola and a pointed belfry.

Tides, Currents and Weather

The Seaplane Hangar is about 290 by 85 ft. and on each side there is a building 160 ft. by 55 ft. These are probably used as workshops.

There is a crane for handling the Seaplanes, a concrete Slipway 100 ft. broad in front of the hangar, a pontoon and moorings.

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Anchorage

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Conspicuous Objects

There is a conspicuous Church with a dark cupola and a pointed bellfry.

Tides, Currents and Weather

A high water-level in the harbour indicates the probability of onshore winds: a low water-level indicates fine weather or the approach of offshore squalls. The stormy winds here are those from the Western semi-circle, especially those which veer to Westerly.

(2) Port Facilities

Description of Harbour

On the South side the Harbour is protected by Molo CALIGOLIANO, which extends 1,180 ft. Westward from the Western part of the town. The inner end of this mole is connected with the Town by a masonry bridge, under which small craft pass to Darsena dei PESCATORI, a small basin South-Eastward of the root of the mole.

On the North-Western side of the Harbour is the Pontile ANSALDO, which extends South-South-Westwards from the shore, with its head 1,980 ft. Northwards from the head of Molo CALIGOLIANO. The entrance to the Harbour, which lies between the heads of these two moles, has depths of from 5½ to 10 fathoms. The Harbour measures 2,600 ft. from North to South and 1,500 from East to West.

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POZZUOLI**

Mooring Buoys

There are mooring buoys for the use of small vessels in the Harbour.

Quayage

Molo CALIGOLIANO.—Length 1,180 ft.; within 33 ft. of the Mole, the depths are irregular and decrease rapidly from the head, where there is about 5 fathoms, to the root, where there is about 1½ fathoms; close to the mole, and about ½ cable from its root, there is a shoal with a depth of 2 ft.

There is also a rock projecting 3 ft. from the quay about 1 cable from the root of the mole.

SANTA MARIA Quay.—Length 500 ft.; extends Northwards from the root of CALIGOLIANO Mole; it has a depth of 13 ft. alongside and small vessels can berth.

EMPORIO Quay.—Length 500 ft.; extends Eastwards from the Northern extremity of SANTA MARIA Quay; it has a depth alongside of from 10 to 13 ft. and berths are reserved for small sailing vessels.

COLOMBO and VILLA Quays.—Extend from the Eastern end of EMPORIO Quay along the shore to the root of Pontile ANSALDO, with a total length of 2,200 ft. There is only about 2 ft. of water alongside.

Pontile ANSALDO.—Length 930 ft., width 100 ft. at its head; has depths of 5 fathoms close to its head, decreasing gradually to about 2 ft. at its root. Warships of the largest size can be brought alongside for placing turrets and guns in position. A 160-ton sheers is available for the purpose.

Berths in Stormy Weather

The best berths in stormy weather are those at the angle of the root of Molo CALIGOLIANO and the SANTA MARIA Quay.

It is dangerous to lie alongside Pontile ANSALDO in Southerly winds.

Estimated Daily Capacity

	<i>Tons per day</i>
SANTA MARIA Quay—two small vessels at 200 tons	400
EMPORIO Quay—two small vessels at 200 tons	400
*Pontile ANSALDO—one vessel at 300 tons	300
Discharging (in case of need) into lighters—two vessels at 200 tons	400
Total	1,500

* Suitable for M/T (weather permitting).

Facilities for Clearing the Port Area

There are two Railway Stations: the low-level Electric Station lies 490 yards to the East of the high-level Steam Railway Station.

The latter has three platforms and small sidings adjoining it.

A branch line runs from the Electric Railway to the Steel Works and on to the Pontile ANSALDO.

(3) The Town

The Town of POZZUOLI has a population of about 22,500.

(4) Government Establishments

COLOMBO and VILLA Quays.—Extend from the eastern end of the main pier to the shore to the root of Pontile ANSALDO, with a total length of 2,200 ft. There is only about 2 ft. of water alongside.

Pontile ANSALDO.—Length 930 ft., width 100 ft. at its head; has depths of 5 fathoms close to its head, decreasing gradually to about 2 ft. at its root. Warships of the largest size can be brought alongside for placing turrets and guns in position. A 160-ton sheers is available for the purpose.

Berths in Stormy Weather

The best berths in stormy weather are those at the angle of the root of Molo CALIGOLIANO and the SANTA MARIA Quay.

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Estimated Daily Capacity

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A branch line runs from the Electric Railway to the Steel Works and on to the Pontile ANSALDO.

(3) *The Town*

The Town of POZZUOLI has a population of about 22,500.

(4) *Government Establishments*

Oil Fuel Storage

The Main Storage for heavy oil for the Fleet is at POZZUOLI.

The new Underground Reservoirs cover an area of about 4 acres and consist of tanks of diameter 130 ft. (Centre of group 090 degrees from centre of Amphitheatre, Admiralty Chart No. 1400, 550 yards.) There are five well-separated Tanks, built into the side of a hill, of total capacity of 25,000 tons. These Tanks are now completed. Five more of similar capacity are under construction on a site about 200 yards to the East.

A third site, on which 10 similar tanks, of total capacity 50,000 tons, are to be erected, is situated on the crest of the hill immediately in line with the Pier at the SILURIFICO ITALIANO and at approximately the same height above sea level: position 319 degrees from centre of Amphitheatre, 1,100 yards, Chart No. 1400. This area has been cleared of trees and construction work has begun.

The Fuel Storage capacity will be in the region of 100,000 tons when all the Tanks under construction are completed.

There is a Pipe Line from the Tanks to the Piers.

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BAIA

(7) Air Facilities

(b) *RAGNI di NERONE*.—Situated on West shore of Gulf of POZZUOLI, a series of Hangars, camouflaged with a lay-out as of a Seaplane Base. (Possibly a Seaplane Factory.)

(c) *AVERNO or CANNITO Lake*.—This Lake, North-West of POZZUOLI Bay, surrounded by a range of horse-shoe shaped hills opening Eastwards, has a water area of 1 mile radius. It appears to have been recently taken into use by Flying Boats for the purpose of embarking and disembarking passengers; but there are no indications that anything in the nature of a Seaplane Station has been completed.

An old house in the vicinity is being renovated for use as a guest house for passengers.

(8) War Material Factories

Silurificio Italiano (formerly *Armstrong's Ordnance Works*).—These important Works occupy an area of nearly 80 acres and a water frontage of 1,640 yards on the North-West side of the Town of POZZUOLI, 7 miles West of NAPLES. In 1939, they were transferred to the ANSALDO Company for a price of about 7½ million lire with the obligation of remodelling and increasing the plant and keeping it in a state of efficiency according to conditions laid down by the Ministry of War. The Works are divided into two principal groups—the Steel Works and Ordnance Shops. The Steel Works can produce Siemens-Martin and crucible steel in ingots up to 90 tons, but not large forgings.

The Ordnance Shops are on a large scale and undertake the construction of 15-in. guns, and turrets with their auxiliary fittings, as well as types of ordnance of smaller calibre and torpedoes. There is a well-equipped proving ground. Works have also been adapted to a certain extent for repairs to locomotives.

Torpedo-Firing Range.—Torpedoes, manufactured in the above factory, are tested on the range which runs from SAN MARTINO Rock, North of PROCIDA Channel, in a Northerly direction: buildings in connection with this range provide a target.

(9) Power Plants

Power for *Silurificio Italiano* is provided by a Central Electric Power Station.

(10) Transport Facilities

POZZUOLI is on the Main Coastal Road and Railway. (See also paragraph (2) PORT FACILITIES—Facilities for Clearing the Port Area.)

(12) Defences

The Coast Defence and Anti-Aircraft Batteries are included in the report on NAPLES, which see.

Boom

A single-line boom, 826 yards long, stretches across the Harbour entrance from PONTILE ANSALDO to the Molo CALIGOLIANO (A.2, 1942). It allows a passage for shipping 360 ft wide at a distance of 300 ft. from Molo CALIGOLIANO.

BAIA

(Lat. 40° 48' 54" N., Long. 14° 04' 24" E.)

(See Admiralty Chart No. 1400)

(1) General Remarks

BAIA is situated on the Western side of POZZUOLI Bay. There is no enclosed harbour.

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(1) General Remarks

BAIA is situated on the Western side of POZZUOLI Bay. There is no enclosed harbour. It is of interest because of the presence there of a Torpedo Store from which torpedoes are issued to the Italian Fleet after testing on the range. Buildings in connection with this establishment provide a target.

Anchorage

Small vessels can anchor, in depths of 4½ fathoms, about 2½ cables off shore, with the beacon on SECCA FUMOSA in line with the light-tower on the head of Molo CALIGOLIANO at POZZUOLI bearing about 094°.

There is anchorage, in depths of 7 fathoms, with the beacon on SECCA FUMOSA bearing 067°, and distant about 3¼ cables from Punta dell'EPITAFFIO.

There is anchorage, specially frequented by sailing vessels, with the light-tower on Fortino TENAGLIA bearing 168°: holding ground here is good.

Conspicuous Objects

The Temple of Venus, an octagonal structure: a group of crenellated houses and a church on Punta dell'EPITAFFIO and the Castello di BAIA are conspicuous.

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BAIA 257

(2) Port Facilities*Description of Harbour*

There are no enclosing breakwaters.

Quayage.—The main quayage, CANTIERI MERIDIONALI, is in a bay between Punta dell'EPITAFFIO and Castello di BAIA.

There is a quay, 720 ft. long by 485 ft., upon which there are two building slips: depth at head $1\frac{1}{2}$ to 2 fathoms.

There are two jetties, 195 ft. and 115 ft. long respectively, on the North side of the Quay, with depths of $\frac{1}{2}$ to $\frac{3}{4}$ fathom alongside.

At the North end of the base of this quay there is another quay, 365 ft. in length: depths $\frac{1}{2}$ to 1 fathom.

Further quayage extends Northwards from the base of the latter quay for a distance of 765 ft.: with depths of $\frac{1}{2}$ to 1 fathom.

There are four piers and two cable conveyors as follows:—

- (a) A Wooden Pier, situated 225 yards North of Punta dell'EPITAFFIO, length 350 ft.: depth alongside about 2 fathoms.
- (b) A Wooden Pier, situated 225 yards Westward of Punta dell'EPITAFFIO, length 580 ft.: depth at head $2\frac{1}{4}$ fathoms, decreasing to $\frac{3}{4}$ fathom 300 ft. from its head.
- (c) A Cable Conveyor from a small concrete platform 690 ft. from the shore, situated about 200 yards South of the Shipbuilding Quay: depth of water at the seaward end about $3\frac{1}{4}$ fathoms.
- (d) A Wooden Pier situated 290 yards South of Castello di BAIA, length 600 ft.: depth of water at its head about $2\frac{1}{4}$ fathoms.
- (e) A Cable Conveyor from a small concrete platform situated 130 yards South of the Wooden Pier at (d); length 590 ft.: depth of water at the seaward end about 4 fathoms.
- (f) A Wooden Jetty situated 900 yards South of the Conveyor at (e), length 195 ft.: depth of water alongside head about 1 fathom.

Estimated Daily Capacity

One thousand to 1,500 d.w. tons of light military stores, which would have to be landed by lighter. The piers, etc., are unsuitable for landing M/T.

Warehouses and Stacking Space

At the base of the "MERIDIONALI" Quay there is an area of 700 yards by 180 yards containing (workshops and) warehouses.

Great use is made of caves on the mountainous coastline. Both conveyors and piers, *see* above, are used in conjunction with the dumps.

Tunnels have been made under the coast road behind the piers and conveyor at (e) to give access to extensive caves. Conveyor at (c) crosses the coast road to caves above on the West side.

More caves are situated on the hillside 630 yards North-West of Punta dell'EPITAFFIO, here a Decauville railway is in operation. There is an underground entrance on the West side of Lake AVERNO, 585 yards from the South-West corner. A well-defined road runs from the coast road, skirts the East side of Lake LUCRINO and runs to Lake AVERNO, it then follows the shore round the South and West sides to the underground entrance.

Mooring Buoys

There are two mooring buoys, $4\frac{1}{2}$ cables South-Eastward and 4 cables Eastward respectively, of Punta dell'EPITAFFIO.

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- (a) A Wooden Pier, situated 225 yards North of Punta dell'EPITAFFIO, length 350 ft.; depth alongside about 2 fathoms.
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Mooring Buoys

There are two mooring buoys, $4\frac{1}{2}$ cables South-Eastward and 4 cables Eastward respectively, of Punta dell'EPITAFFIO.

(3) The Town

The Modern Village of BAIA has a population of about 2,000.

(4) Government Establishments

There is a Torpedo Issuing Station at BAIA. There is some constructional work in progress on the North and East sides of Lake LUCRINO: the nature of these activities is not known.

(7) Air Facilities

Seaplane Station

A building, 280 by 90 ft., with a double V roof and a slipway, is situated on the North side of Punta dell'EPITAFFIO.

No seaplanes are reported present, but its position and appearance suggest that it could be used as a seaplane hangar.

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(5) Commercial Establishments

Caniteri ed Officine Meridionali

A small shipyard in position Lat. 40° 48' 48" N., Long. 14° 04' 30" E.; there are two building slips.

These works are reported to be closed down except for minor repair work.

(10) Transport Facilities

Road

There is a main road to NAPLES via POZZUOLI.

Railway

There is a branch from the Main Coastal Railway system which connects BAIA with POZZUOLI and NAPLES.

(12) Defences

The defences of BAIA are included in the report on NAPLES, *which see*.

PORT MISENO

(Lat. 40° 47' 24" N., Long. 14° 05' 00" E.)

(See Admiralty Chart No. 1400)

(1) General Remarks

Port MISENO is a natural harbour situated on the Western extremity of POZZUOLI Bay. It is used by schooners and small vessels.

Anchorage

Anchorage is, in normal times, prohibited to merchant ships, but nevertheless two ships of about 270 ft. length have been seen at anchor inside the harbour during the present war.

Conspicuous Objects

The Customs House, a small one-storey red building, near the Southern side of the Canal, is conspicuous: Punta TERONE is brown and rocky and 75 ft. high: Punta PENNATA is the extremity of a long rocky tongue of land. The entrance lies between these two points.

(2) Port Facilities

Description of Harbour

The Harbour measures about 1,000 yards from East to West and is about 500 yards across at the widest part. The navigable entrance is half a cable wide, depth at entrance 4½ fathoms. In the outer part of the harbour there are depths of 3 to 6 fathoms and in the inner harbour, to the Westward of Punta SCARPARELLA, of from 1½ to 2½ fathoms.

Lago MISENO is separated from the Harbour by a narrow strip of land with a canal through it; this canal is crossed by a bridge.

The shores of the outer part of the Harbour are high and rocky and those of the inner part are low and sandy.

Mooring Buoys

There are several mooring buoys in the inner part of the harbour.

(12) Defences

The defences of BAIA are included in the report on NAPLES, *which see*.

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Lago MISENO is separated from the Harbour by a narrow strip of land with a canal through it; this canal is crossed by a bridge.

The shores of the outer part of the Harbour are high and rocky and those of the inner part are low and sandy.

Mooring Buoys

There are several mooring buoys in the inner part of the harbour.

Quays and Piers

Pier

There is a Pier of length 440 ft. on the South side of the inner harbour with a depth of water of 2½ fathoms at its head.

Quayage

There is no quayage.

Lifting Appliances

There is a crane on the end of the Pier.

Estimated Daily Capacity

Two hundred tons of military stores. The Pier is unsuitable for landing M/T.

(3) The Town

The Village of MISENO lies about 1½ cables Westward of Punta TERONE, between that point and Punta SCARPARELLA.

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TORRE ANNUNZIATA 259

(4) Government Establishments

These include the Customs House and a Magazine belonging to the Italian Navy. The latter is sited at the root of the Pier.

(12) Defences

Coast Defence and Anti-Aircraft Batteries are included in the report on NAPLES, which see.

Booms

There is a boom across the harbour entrance.

TORRE ANNUNZIATA

(Lat. 40° 45' N., Long. 14° 27' E.)
(See Admiralty Chart No. 1400)

(1) General Remarks

TORRE ANNUNZIATA is a small harbour situated at the Northern extremity of BAIA di CASTELLAMARE at the Eastern end of the Gulf of NAPLES.

Anchorage

There is anchorage in the roadstead outside the harbour in depths of 5½ fathoms; the holding ground is good.

Conspicuous Objects

The most conspicuous object is the grey cupola of the Church of the Carmine. The Light Tower at the head of the Western Mole is also conspicuous.

Tides, Currents and Weather

South-Easterly winds cause most swell and do most damage to vessels moored at the quays. During South-Westerly gales the sea washes over the Western Mole.

Before South-Easterly winds set in there is a remarkable agitation of the water in the port. Vessels securing to the moles drop two anchors well apart and use plenty of cable. In fresh North-Westerly winds securing to the Western mole is dangerous as the vessel is liable to be thrown against the quay.

Between TORRE ANNUNZIATA and SCOGGIO di REVIGLIANO the current does not usually exceed 1½ knots except with fresh Easterly winds when the rate is considerably increased and the current is felt more in the offing.

(2) Port Facilities

Description of the Harbour

The Harbour is formed by two moles; the Western mole extends about 4 cables Southwards from the shore at the North-Western end of the Town; the Eastern mole, Molo del CARBONE, extends 1½ cables South-Westward from a position on the coast about 2¼ cables South-Eastward of the root of the Western mole.

The Harbour measures about 650 yards from North to South and has a maximum width of 580 yards; the navigable width at the entrance, where there is 3½ to 4½ fathoms of water, is 300 yards.

(1) General Remarks

TORRE ANNUNZIATA is a small harbour situated at the Northern extremity of BAIA di CASTELLAMARE at the Eastern end of the Gulf of NAPLES.

Anchorage

There is anchorage in the roadstead outside the harbour in depths of $5\frac{1}{2}$ fathoms; the holding ground is good.

Conspicuous Objects

The most conspicuous object is the grey cupola of the Church of the Carmine.

The Light Tower at the head of the Western Mole is also conspicuous.

Tides, Currents and Weather

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Between TORRE ANNUNZIATA and SCOGGIO di REVIGLIANO the current does not usually exceed $1\frac{1}{2}$ knots except with fresh Easterly winds when the rate is considerably increased and the current is felt more in the offing.

(2) Port Facilities

Description of the Harbour

The Harbour is formed by two moles; the Western mole extends about 4 cables Southwards from the shore at the North-Western end of the Town; the Eastern mole, Molo del CARBONE, extends $1\frac{1}{2}$ cables South-Westward from a position on the coast about $2\frac{3}{4}$ cables South-Eastward of the root of the Western mole.

The Harbour measures about 650 yards from North to South and has a maximum width of 580 yards; the navigable width at the entrance, where there is $3\frac{1}{4}$ to $4\frac{3}{4}$ fathoms of water, is 300 yards.

Inside the Harbour, except on the Northern and Eastern sides where the depth shoals to 1 fathom, there are depths of from $3\frac{1}{4}$ to $4\frac{3}{4}$ fathoms.

The Harbour is subject to slow silting.

Quayage

Western Mole.—The Western Mole is quayed along the inside for the whole of its length. Alongside the first 1,200 ft. from its head there are depths of from 5 to $3\frac{1}{4}$ fathoms; the remaining 1,200 ft. has depths of from $\frac{3}{4}$ to $2\frac{1}{4}$ fathoms alongside.

Eastern Mole (Molo del CARBONE).—The inner, or North-Western, side is quayed for a length of 800 ft. but there is only about 1 fathom of water alongside.

Cala CROCELLE.—This quay extends along the North-Eastern side of the Harbour; it is 1,000 ft. long with depths of from 2 to $3\frac{1}{4}$ fathoms alongside.

Northern Quay.—This runs in a semi-circle round the North side of the Harbour for a length of about 1,000 ft. and has depths of from $\frac{1}{4}$ to 2 fathoms alongside.

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TORRE ANNUNZIATA

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Coal

A stock of coal is maintained.

Water

Water is laid on to some of the quays. There is also a water tank boat.

Estimated Daily Capacity

	Tons.
*Western Mole: three vessels at 400 tons	1,200
Cala CROCELLE: four small vessels at 200 tons	800
By lighters	1,000
Total†	3,000

*Suitable for M/T. † Of which only about 2,000 tons could be cleared.

Facilities for Clearing the Port Area

Railway sidings serve the Molo del CARBONE and the Cala CROCELLE.

Warehouses

There are warehouses near the root of the Molo del CARBONE.

(3) The Town

TORRE ANNUNZIATA is a small town situated on the shore on the North-East side of the harbour.

There is a hospital.

(4) Government Establishments

The Harbour Office and Customs House are situated at the North-Western end of the Cala CROCELLE.

There is a Branch Factory of the Royal Arsenal which makes explosives in position 017°, South-East end of Western Mole, 1,400 yards.

(8) War Material Factories

(See (4) GOVERNMENT ESTABLISHMENTS.)

(10) Transport Facilities

Road and Railway

TORRE ANNUNZIATA lies on the Main Coastal Road and Railway.

See also paragraph (2) PORT FACILITIES—Facilities for Clearing the Port Area.

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(12) Defences

The Coast Defences and Anti-Aircraft Batteries are included in the report on NAPLES, which see.

Boom

A single line Boom, 333 yards in length, stretches across the harbour entrance from the Punta TERONE to Punta di PENNATA. (A.2, 1942.)

(13) Reconnaissance

There is a stretch of sandy beach which extends from the Eastern Mole of the Harbour of TORRE ANNUNZIATA for a distance of 3½ miles South-South-Eastward to the Eastern Mole of the Harbour of CASTELLAMARE di STABIA. The hinterland consists of a large fertile plain dotted with farm houses.

OTRANTO, PORTO 261

OTRANTO, PORTO

(Lat. 40° 08' 40" N., Long. 18° 29' 33" E.)

(See Plan 26)

(1) **General Remarks**

OTRANTO is at the present moment of little importance either for naval or mercantile shipping.

Fourteen small craft have been seen in the harbour.

Anchorage

Small vessels anchor between Punta CRAUL and the town on the line joining that point to the belfry of the cathedral, with the point bearing 008°, distant 1½ cables, in a depth of 3½ fathoms, sand, good holding ground.

Vessels not wishing to enter the harbour anchor in the outer anchorage, in a depth of 10 or 11 fathoms, with Punta CRAUL bearing 282° and Torre SERPENTE 150°; the holding ground is not good.

Conspicuous Objects

The steeple of LECCE Cathedral, 19½ miles North-Westward of OTRANTO, 6 miles from the coast.

The high land of Cape OTRANTO.

The Signal Station of PALASCIA with a lighthouse below it.

The Castle on the South-Eastern side of the town.

Weather

Bora gales raise a very heavy sea in the bay.

(2) **Port Facilities**

Porto OTRANTO is a bay, about 4 cables wide, formed between Punta SAN NICOLA to the South-Eastward, and Punta CRAUL, which is low and rocky, to the North-Westward.

Punta SAN NICOLA terminates in a quay and protecting mole which extends from a point about one cable North-Westward and then for three-quarters of a cable West-North-Westward.

A sandbank, with several rocks awash on it, extends from the town to about half a cable South-Westward of the molehead, and the passage between the rocky shoal and the Northern extreme of this bank and another close Southward of the head of the mole is 44 yards wide, with depths of 15 to 18 ft.

A space South-Westward of the head of the mole has been dredged to a depth of 2½ fathoms, and the Eastern area of the harbour to a depth of 10 ft. by the shore and to a depth of 2½ fathoms near the angle of the mole.

Trade

Very little trade is carried on, the only exports being agricultural produce.

(3) **The Town**

The town stands on the Southern side of the bay, protected by surrounding walls and a castle.

(10) **Transport and Facilities**

Railways

OTRANTO is the terminus of the railway system communicating, through BRINDISI, with the rest of ITALY.

Roads

There are main roads to LECCE (via MARTANO) and CASTRIGNANO (via MAOLIE) and a secondary coast road to CASTRIGNANO (via TRICASE).

New Roads

A road, of recent construction, leads from the town to the Torre dell' ORTO.

The steeple of LECCE Cathedral, 19½ miles North-Westward of OTRANTO, 6 miles from the coast.

The high land of Cape OTRANTO.

The Signal Station of PALASCLIA with a lighthouse below it.

The Castle on the South-Eastern side of the town.

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New Roads

A road, of recent construction, leads from the town to the Torre dell' ORTO.

The road from MINERVINO now runs near the East end of the castle, where it turns sharply West and runs below the South wall of the castle before entering the town.

Another new road runs from the Eastern breakwater along the South-East side of the harbour. Dividing on reaching the castle, the Northern branch enters the town North of the castle and the Southern branch runs South-East to join the road to MINERVINO.

A new road also leads from the breakwater to four new buildings, which measure 140 ft. by 50 ft., the purpose of which is not known, which are sited on the coast East of the castle. This road continues from there Southwards and joins the road to Torre dell' ORTO.

(11) Signal Communications

Cables

Three cables leave the shore South-Eastward of OTRANTO near Punta ORTO, one to VALONA, one to CORFU and another to ZANTE.

Telegraph

There is a Telegraph Office in the town.

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(12) Defences

No recent or accurate information is available.

An old report (1930) placed four 6-in. guns on Torre dell' ORTO. This has not been subsequently confirmed (now graded D.O.).

A report (graded C.3), dated September, 1940, stated that there are underwater torpedo tubes: no details given.

PANTELLERIA

(See Plan 74)

(1) General Remarks

General Description

The strategic importance of PANTELLERIA lies in its geographical position on the flank of the route through the PANTELLERIA Channel: it is a part of the Sicilian Command. The only artificial harbour is at the Village of PANTELLERIA at the North-West end of the Island.

It is used as a small M.A.S. Base and for sheltering small craft.

The harbour is shallow and has to be kept dredged. It is reported, but not firmly established, that covered and protected moorings for submarines and M.A.S. have been made on the Island by cutting into the rock. M.A.S. usually moor in the shelter of the Western breakwater.

Submarine shelters, constructed in the rock cliffs, have also been reported at the following places:—

- (1) Punta di FRAM, on the West coast.
- (2) Porto SCAURI, where there is a landing place and a wharf, on the South-West coast.
- (3) Grotto dei Palombi, on the South-West coast.
- (4) Punta SALINA, on the East coast.
- (5) Punta TRACINO, where there is a small landing stage, on the North-East coast.
- (6) Punta SPADILLO, on the North coast.
- (7) CALA BUE MARINA, on the North coast.

The reports of these submarine shelters are not reliably confirmed, but may well be true.

The Island, which is about two-thirds the size of MALTA, is about 7 by 4 miles and has a civil population of about 2,000. It is of volcanic origin and formed of mountainous masses surrounding Monte GRANDE, 2,730 ft. The slopes of the hills are dotted with huts, single storied houses of stone, and vineyards: except in its most precipitous portions the countryside is cultivated in very small fields which are terraced and divided by low stone walls. The largest fields are about 10 acres and most of them are less than half that size, long and narrow in shape, so that going up a hillside walls will be encountered every hundred yards or so.

Anchorage

(i) There is an anchorage off PANTELLERIA Harbour on the line joining the outermost above-water rocks off Punta San LEONARDO and those off Punta della CROCE, with Castello RELEGATI in line with the head of the Mole. In calm weather the bottom is visible, and care should be taken to select a sandy spot: this anchorage is exposed to the prevailing North-West winds.

(ii) *Ancoreggio di CAMPOBELLO*.—On the North-East coast, between Punta KARUSCLA

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(ii) *Ancoraggio di CAMPOBELLO*.—On the North-East coast, between Punta KARUSCIA and Punta POZZOLANA, there is anchorage in the shelter of Punta KARUSCIA: depth 16 fathoms; rocks, weed, coarse sand and gravel.

At about 800 yards from Punta KARUSCIA a reef of rocks is hewn out to make a wharf between two rocky points.

(iii) *Punta GADIR*.—There is anchorage 1 mile, 130° from SPADILLO Lighthouse.

South of this point, a little inlet shelters a wharf where small vessels can come alongside.

(iv) *Cala di TRAMONTANA*.—Between Punta TRACINO and Punta RUBASACCHI, there is anchorage in depths of 11 and 12 fathoms, rocks, bad holding ground: this is one of the mail-boat's anchorages.

There is a wharf at the bottom of the inlet to which small steamers secure their sterns.

(v) *Cala di LEVANTE*.—There is anchorage between Punta TRACINO and Punta dell'ARCO, which affords better protection from the mistral.

The anchorage is 270 yards from the FARAGLIONE, at the bottom of a little inlet.

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(vi) *Porto SCAURI*.—This is the most usual alternative to PANTELLERIA Harbour during heavy weather from the Northward.

Anchorage is 100 yards South of the Grotto of SCAURI; there is a depth of 11 fathoms, sand, gravel, seaweed and a few rocks. Ships berth by mooring their sterns to the tops of the rocks round the grotto and keeping their sterns 50 yards from the shore.

The 25 fathoms line lies about 60 yards from the shore, after which the depth increases rapidly.

On the East side of the inlet there is a wharf where small vessels can come alongside the South side; there is a depth of 10 to 13 ft.

Conspicuous Objects

A Signal Station, at an elevation of 833 ft. on Monte Sant-ELMO, at the North-West end of the Island, about 1½ miles South-South-East of Punta San LEONARDO, is conspicuous as is also an iron light structure on a square tower 33 ft. in height on Punta San LEONARDO; on higher ground, South-East of this light structure there is a conspicuous cylindrical stone tower.

Castello RELEGATI, in the middle of the Town, at the head of the Bay is also conspicuous.

Weather

General Description of Climate

From May to September the climate is characterised by mainly clear skies; variable, though predominantly North-Westerly winds, seldom exceeding force 4; almost no rain except perhaps during the last fortnight of September; fairly high temperatures but not unduly damp. From October to March, and to a less extent in April, conditions are controlled as a rule by depressions that cause changing and disturbed conditions, accompanied by periods of much cloud, rain, fresh or strong winds. Spells of fine weather with light or moderate winds and fairly clear skies are quite a common feature in the winter half year however, particularly in October, March and April.

Winds

Winds are more often from North-West or West than from any other direction except perhaps in the autumn when winds between South and East are equally prevalent. Winds of force 7 or more are almost unheard of between mid-April and early November, and occur on the average on about 4 days each during December, January, February and March, 2 to 3 days in April, and 1 to 2 in November; these gales are usually from a West-North-Westerly direction in winter but are equally likely to be from South-East or East in spring.

Cloud and Rain

The cloudiest and rainiest season is from October to March with a maximum in December. Rain falls in heavy showers as a rule and an appreciable fall occurs on about 10-12 days in December and 5 or 6 days in October and March, though falls are heavier in October than in March. In the South of England the monthly rainfall for December is about two-thirds that of Malta Channel but falls on a larger number of days. Skies, even in December—the cloudiest month—are clearer on the average than any month in the South of England.

Temperatures

Temperatures range from about 65° to 45° F. in January and from 93° to 68° in July and August. Summer temperatures last well into autumn, and October is as hot as the end of May. Heat is seldom of a damp nature and is therefore not difficult to bear with.

Visibility

Night visibility must necessarily depend on cloud conditions, but as a guide it is usual to consider that a destroyer can be seen at 1 mile, a cruiser at 2 miles and a battleship at 3 miles on a clear, dark starry night.

Castello RELEGATI, in the middle of the Town, at the head of the Bay is also conspicuous.

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Night visibility must necessarily depend on cloud conditions, but as a guide it is usual to consider that a destroyer can be seen at 1 mile, a cruiser at 2 miles and a battleship at 3 miles on a clear, dark starry night.

Boats or landing craft will not be seen in silhouette from the look-out positions unless these are on the beach. Probably they will not be seen before they are heard.

It is estimated that buildings should show in silhouette at $\frac{1}{2}$ to 1 mile on such a night, and that as the houses are white they should show up at about $\frac{1}{4}$ mile against the surrounding terrain.

(2) Port Facilities

Description of Harbour

The Harbour is impossible of approach or exit in bad weather or with a strong North-Westerly wind.

Inner Harbour.—There is a small inner harbour, about 900 by 900 ft., enclosed by a breakwater which extends North-North-Eastward for 1,000 ft. on its Western side, and another which extends Westwards for 300 ft. on the Northern side. The entrance, which is 450 ft.

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wide, lies between the heads of these two moles. The Western part of the Harbour is shallow and obstructed by the ruins of an old breakwater. The Eastern part can only accommodate small craft. In this part there are depths of up to 2 fathoms, but alongside the quays on the North-Eastern side, which are the only accessible ones, there is only about 6 ft. of water: these depths extend 30 yards from the quays.

Outer Harbour.—The outer harbour is not completed, but a breakwater extends Northwards from Punta della CROCE for a distance of 960 ft., from near the Northern end of which a spur extends Eastwards—length 450 ft. At the outer end of the breakwater there are depths of up to 4½ fathoms. There is little protection from the sea in winds from North-East to North-West.

There is no breakwater at Punta S. LEONARDO.

Mooring Buoys.—There are three mooring buoys on the Westward side of the inner harbour which are used to assist ships to manoeuvre.

Accommodation.—It is unlikely that more than eight ships of 200 ft. length could berth in the inner harbour.

In the outer harbour, generally speaking, there is anchorage only: it is possible that destroyers or other small ships could berth alongside but they would be very much exposed to the prevailing wind in the winter months.

No accommodation can therefore be relied on in the outer harbour.

Quayage

Quays.—The inner harbour is quayed but only those on the North-Eastern side are accessible; depths alongside of 6-7 ft. extend 90 ft. out from the quays.

Lifting Appliances.—There is one steam crane—lifting capacity 1 ton.

Harbour Craft.—There are 12 lighters—carrying capacity 12-18 tons.

Repair Facilities.—There is one careening grid for small shipping on Pontile BARBACANE, North of the Castle.

Trade

Wine, dried fish and agricultural produce are exported.

Facilities for Clearing the Port Area

There is a light railway from the outer Western Breakwater to the aerodrome through a tunnel 3,400 yards long: it runs round the perimeter of the aerodrome: another line runs from the breakwater to a quarry at Cala dell' ALCA for transport of stone or harbour construction work.

The line to the aerodrome is not confirmed.

Water Supply

The water supply is adequate for all purposes and none is imported. The principal supply comes from three large wells to the East of the town. The water from them is pumped through two intermediary storage tanks to the aerodrome. In addition every house has its own rain-water cistern and there are also hot and cold water springs. The water from the latter is brackish and not fit for drinking.

The water in the lake, Bagno del ACQUA, the level of which is 25 ft. below sea level, comes from hot springs and contains deposits of carbonate of soda and Silica salts. The temperature of this water is about 120° F.

(3) The Town

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The water in the lake, Bagno del ACQUA, the level of which is 25 ft. below sea level, comes from hot springs and contains deposits of carbonate of soda and Silica salts. The temperature of this water is about 120° F.

(3) The Town

Hospital

There is a small hospital in the Town

(4) Government Establishments

Barracks

- (i) Air Force Barracks, 550 yards South of Southern corner of Aerodrome.
- (ii) A group of buildings, about 150 yards South of the Central Mole, four being North of the road and one South of it. About 400 yards South-East of this Barracks is another group of three buildings believed to be used for the same purpose.
- (iii) Barracks are reported in North-East part of town. About 200 yards North of the Eastern Mole, there is a group of eight buildings near the coast.

A prison is reported to be located here, but some of the buildings may also be used as barracks.

PANTELLERIA 265**Fuel Storage**

Aviation spirit is probably stored in one of the numerous underground workings at the Aerodrome. There are seven tunnel entrances on the Eastern flank of Monte S. ELMO. Petrol in drums is also deposited South-East of the Aerodrome.

Ammunition Storage

Ammunition may be kept underground at any of the underground points mentioned above. There is also a group of dispersed huts in a ravine 1,000 yards South-East of the Southern corner of Aerodrome, believed to be used for explosives storage.

There is other storage underground at Stagno di BAGNO (700 yards South of Punta POZZOLANA) and in caves $\frac{1}{2}$ -mile South of Village of ERRARA. There are also six long sheds South of the base of the Western Mole.

Depots for Naval Material

Depots for Naval material have been reported at :—

- (1) Cala BUE MARINO on the North coast.
- (2) Bagno dell' ACQUA (North and West shores thereof).
- (3) In the basements of the "Confino" building which is situated between the North of the Town and Punta S. LEONARDO Lighthouse.
- (4) At the end of Punta POZZOLANA on the North coast in the vicinity of Bagno dell' ACQUA.

(7) Air Facilities**Aerodrome**

There is an Aerodrome, sited 600 ft. above sea level, North-East of Monte GELKHAMAR: the landing ground is roughly in the shape of a parallelogram.

The grass surface is hard with a rock basis. Its dimensions are :—

N.—S.	..	..	..	1,600 yards
N.E.—S.W.	..	..	..	1,250 yards
E.—W.	..	..	..	1,100 yards
S.E.—N.W.	..	..	..	700 yards

The aerodrome slopes down from South to North with an average gradient of not more than 1 in 50.

The approaches are good from North-West, North and North-East, for the adjacent ground falls away in those directions; but there is high ground along the Western edge, rising sharply to two peaks with a valley between them. Beyond the Southern and South-Eastern boundaries the ground rises higher, but less abruptly.

(ii) The main advantage the aerodrome offers is the well-protected stowage for aircraft. Two tunnels lead into an underground hangar at the foot of Cuddia di GLINDO, reported to consist of 9 cells. It is estimated that 30 fighters could be housed in it and possibly more.

Underground Workshops, Magazines and Reservoirs are reported to be under the Southern slopes of Cuddia del CATT and the main aerodrome buildings are situated in the valley to the Southward of it.

Fuel, oil and water are available, also two night-landing lights.

Operationally it is used as a fighter aerodrome and as an intermediate landing ground for all types of aircraft operating from SICILY and SARDINIA.

(9) Power Plants

An Electric Power Station has been reported underground near the Aerodrome: location not known.

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(10) Transport Facilities

Narrow Gauge Railway

See paragraph (2) PORT FACILITIES: Facilities for clearing the Port Area.

Road

There is a coast road for inter-communication between the Coast Defence Batteries and for defence purposes. This road, which is about 24 miles in length and 40–45 ft. wide in some sections, runs within 400 yards of all possible landing places, but at some height, generally about 100 ft. above them. Nothing is known of motor transport available.

There are some other motor roads, notably those leading to the Western boundary of the Aerodrome from the Town and from Porto SCAURI.

Other roads are best described as mule-tracks.

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(11) Signal Communications

W/T

A W/T Station is also reported, but unconfirmed, underground near the Aerodrome: location not known.

A W/T Station is reported, but unconfirmed, in Cuddia di CALT, the South-East spur on Monte S. ELMO and another at the summit of Monte S. ELMO near the V/S Station.

Telegraph and Telephone

There is telegraph and telephone communication between the Town and SCAURI and TRACINO. It may also be assumed that the Aerodrome and all Coast Defence positions and Observation Posts are connected to the Town by telephone.

Cables

There are three cables. They are:—

- (a) The old cable from MAZARA (SICILY) which lands in or near the harbour of PANTELLERIA and was reported to have been cut by the French in June, 1940, but may since have been repaired.
- (b) A cable to LINOLA, which lands probably at Porto SCAURI (South-West coast).
- (c) A telephone cable from Porto EMPEDOCLE (SICILY) to PANTELLERIA and thence to LAMPEDUSA and TRIPOLI, was to have been laid in 1940; it appears to have been completed, at least as far as PANTELLERIA.

Cable Landing.—A cable is landed 215 yards East of Punta St. LEONARDO Lighthouse and is trenched for 170 yards to a square, white building with a small central court. The position of this building is 130 yards North-North-East of the hospital.

V/S Station

There is a conspicuous Visual Signalling Station on the summit of Monte S. ELMO—833 ft. above sea level: there is also a station on MONTE GIBELE.

(12) Defences

General Scheme of Defences

There are 19 Coast Defence Batteries which, if reports of two batteries of 11-in. guns, the existence of which is doubtful (positions graded A.2, calibre unconfirmed and graded D.O) are discounted, consist of 3-in. H.A./L.A. and 4.7-in. guns, with the possibility of 6-in. guns in one position (P. GUARDIA). The probability is, however, that these are of 4.7-in. calibre.

The general scheme of defence includes, at each battery position, a searchlight drawn by a caterpillar tractor.

When not in use the searchlights and tractors are stowed in thick concrete shelters camouflaged with a dressing of local stone—a form of camouflage which is in general use on the Island.

The tractors—once the searchlights are in position—return to their shelters and are then used to generate the electric power for the lights.

At each battery position there is an underground store for ammunition.

(i) Sea Front Defences

(a) Coast Defence Batteries

No.	Name or Location.	Local Position and Description.	No. and Calibre of Guns.	Grading.		Date of Latest Report.
				Position and No. of Guns.	Calibre.	
1	BUE MARINO	North-East of the harbour.	6—4.7-in.	A.2	A.2	12.41
2	PANTELLERIA	800 yards South.	6—3-in. H.A./L.A.	A.2	A.3	12.41

- (b) A cable to LINOLA, which lands probably at Porto SCAURI (South-West coast).
- (c) A telephone cable from Porto EMPEDOCLE (SICILY) to PANTELLERIA and thence to LAMPEDUSA and TRIPOLI, was to have been laid in 1940; it appears to have been completed, at least as far as PANTELLERIA.

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No.	Name or Location.	Local Position and Description.	No. and Calibre of Guns.	Grading.		Date of Latest Report.
				Position and No. of Guns.	Calibre.	
1	BUE MARINO ..	North-East of the harbour	6—4.7-in.	A.2	A.2	12/41
2	PANTELLERIA	800 yards South-East of P. della CROCE, on the top of a hill.	6—3-in. H.A./L.A.	A.2	A.3	12/41
3	P. della CROCE ..	25 ft. emplacements, 50 yards apart.	4—3-in. H.A./L.A.	A.2	A.3	12/41
4	Canie LISICIO ..	Sited on the high ground.	6—3-in. H.A./L.A.	A.2	A.3	12/41
5	Between Cata dell'ALCA and P. di FRAM.	Sited on the point	3—3-in. H.A./L.A. or 4.7-in.	A.2	A.3	12/41
6	BRIGNONE ..	35 ft. emplacements, 120 yards apart.	4—3-in. H.A./L.A. or 4.7-in.	A.2	A.3	12/41
7	M. GELKHAMAR	Sited on Hill 289	6—3-in. H.A./L.A.	A.2	A.3	12/41
8	Grotto dello STORTO	—	6—3-in. H.A./L.A.	A.2	A.3	12/41

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Coast Defence Batteries—continued

No.	Name or Location.	Local Position and Description.	No. and Calibre of Guns.	Grading.		Date of Latest Report.
				Position and No. of Guns.	Calibre.	
9	P. TREPIETRE ..	20 ft. emplacements. E.D. ..	4—3-in. H.A./L.A. or 4-7-in.	A.2	A.3	12/41
10	M. GIBILE ..	..	2—? 11-in.	B.3	D.0	1940
11	M. GROSSA del QUESO.	..	6—3-in. H.A./L.A.	A.2	A.3	12/41
12	P. LIMARSI ..	Sited along edge of cliff.	5 or 6—3-in. H.A./L.A.	A.2	A.3	12/41
13	M. GIBELE ..	E.D. ..	2—? 11-in.	B.3	D.0	1940
14	Cala di LEVANTE	Sited at the root of the small peninsula on which stands P. TRACINO.	2—3-in. H.A./L.A.	A.2	A.3	12/41
15	Cuddia BANDAZZO	Sited on Hill 416	5 or 7—3-in. H.A./L.A.	A.3	A.3	12/41
16	P. SPADILLO (1)	30 ft. emplacements.	4—4-7-in.	A.2	A.3	12/41
17	P. SPADILLO (2)	Sited 600 yards West of P. SPADILLO.	6—3-in. H.A./L.A.	A.2	A.3	12/41
18	P. KARUSCIA ..	..	6—3-in. H.A./L.A. or 4-7-in.	A.2	A.3	12/41
19	P. GUARDIA ..	35 ft. emplacements.	4—4-7-in. or 6-in.	A.2	A.3	12/41

(c) Local Defences

Twenty-three Local Defence Positions have been located and it is probable that there are others between P. del DUCE and Cala ROTUNDA, on the South-East coast. The exact nature of these posts is not known. Their positions are indicated on Plan 74.

It is observed that these posts are closer to each other between Cala di SATARIA and GROTTI dei PALOMBI on the South-West coast; between Punta FERRARI and Punta MALANOME on the South-South-West coast; and between Punta MORDONI and Punta SPADILLO on the North coast.

(e) Observation Posts

These consist of small square buildings each fitted with a range-finder and a telephone. They are sited as follows:—

- M.S. ELMO in the North-West of the Island, on the North-West slopes.
- M.S. ELMO on the South-East slopes.
- Cuddia MIDA—in the centre of the Island—at the summit.
- CASANO—in the East centre of the Island.
- P. LISCIETTO—in the North-East of the Island—on Hill 153.
- Cala di SATARIA—on the West coast.

(iii) Searchlights

These exist at all Coast Defence Battery Positions.

(v) Local Air Defence

A.A. Batteries

A.A. No. 1 M. GIBILE, sited South-East of Hill 608. 2-3-in. guns mounted on P. 3. Last

		sula on which stands P. TRA- CINO.				
15	Cuddia BANDAZZO	Sited on Hill 416	5 or 7-3-in. H.A./L.A.	A.3	A.3	12/41
16	P. SPADILLO (1)	30 ft. emplace- ments.	4-4.7-in.	A.2	A.3	12/41
17	P. SPADILLO (2)	Sited 600 yards West of P. SPADILLO.	6-3-in. H.A./L.A.	A.2	A.3	12/41
18	P. KARUSCIA	—	6-3-in. H.A./L.A. or 4.7-in.	A.2	A.3	12/41
19	P. GUARDIA	35 ft. emplace- ments.	4-4.7-in. or 6-in.	A.2	A.3	12/41

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P. LISCIETTO—in the North-East of the Island—on Hill 153.

Cala di SATARIA—on the West coast.

(iii) Searchlights

These exist at all Coast Defence Battery Positions.

(v) Local Air Defence

A.A. Batteries

A.A. No. 1 M. GIBELE, sited South-East of Hill 606, 2-3-in. guns, graded B.3: last report, 1940. (For H.A./L.A. guns see list of Coast Defence Batteries.)

A.A. Close Defence

There are A.A. machine guns at coast defence battery positions (graded B.3).

R.D.F. Station

A long-range Aircraft Warning Station, working in band 120-129 Mc/s, exists at Lat. 36° 49' 44" N., Long. 11° 56' 58" E.

(13) Reconnaissance

General

The coast of the Island is, generally, unsuitable for landing from boats, particularly in the South-East: it is largely formed by steep cliffs which rise almost sheer to a considerable height.

There are no sandy beaches, but there are some stretches of rocky coast which are comparatively shelving where landings could be effected in favourable weather.

These areas are classified below. They lie mostly on the shores of the North-Western portion of the Island and thus give access to the principal key points: the Town is within 3 miles, and the Aerodrome only about 1 mile, from the nearest points where landing could be effected.

The Southern and South-Eastern coasts are faced with cliffs which rise to a height of 400 ft. in places.

Detailed Description of Coast

Area No. 1 (a).—North Coast: P. POZZOLANA-CALA DENTI.
An under-water ledge of flat rocks extends for about 100 yards to seaward from a rocky foreshore. There are about 40 yards of uncovered rocks from sea to the base of the cliffs, the tops of which are about 60 ft. above sea level. The ground rises from the top of the cliffs, to the coast road which is 30-100 yards inland, 20-60 ft. above the cliffs. Immediately to the Eastward of P. POZZOLANA is a narrow beach, 50 yards wide, which may be more favourable for landing as there is no under-water shelf of rocks. At the other end, immediately to the Westward of Cala DENTI, there is no beach, the cliffs rising straight out of the sea.

Area No. 1 (b).—North Coast: P. KARUSCIA-P. POZZOLANA.
This section of the coast is of very much the same nature as No. 1 (a) except that there are several gaps in the under-water ledge and that the cliffs do not extend over its whole length. The top of the cliffs or inshore boundary of the rocks is only 20 ft. above sea level. The ground then slopes up to the coast road 100-200 yards inland and 30-60 ft. above the cliffs or rocks.

Area No. 2.—West Coast: Roncone di SALERNO-Grotto della STORTO.
The Northern section of this stretch slopes steeply up to 80 ft. and is not bounded by any rocks on the foreshore.

South of this is a beach, Marina SUVACHI, 1,800 yards in length, bounded by a rocky ledge extending under water for 50-100 yards to seaward. The inshore boundary of these rocks is only 20 ft. or less above sea level and the ground slopes gently up from there to the coast road 100-150 yards inland. There are no cliffs on this section. There is then a stretch of 500 yards of cliff, in places over 100 ft. high.

South of this cliff the coast for some 2,500 yards resembles the Marina SUVACHI except that the inshore boundary of the rocks is 40 ft. instead of 20 ft. above sea level.

Area No. 3.—North-West Coast: P. della CROCE-Cala dell' ALCA.
The whole of this area is fully exposed to the prevailing North-West wind.

The coast on the Northern part of it is very low-lying; the land slopes gently into the sea and continues as an under-water ledge.

Southward of this section the foreshore is rocky—a 30-ft. wide strip of rock rising to about 40 ft. A light railway runs along the foreshore.

The coast road is not more than 150 yards inland.

There is no cliff except at one point where it is 80 ft. high.

Area No. 4.—South-West Coast: P. del ROSSO di NICO-Cala di LICATE.

Immediately South of the 400-ft. high cliffs which end at P. del ROSSO di NICO there is a section of coast half a mile long where there is no cliff and the land slopes down steeply to the sea at an average gradient of 1 in 4. There are no outlying rocks. South of this stretch there is a small sheltered cove on the Eastern shores of which landing conditions are similar.

Between this cove and the point where the cliffs recur a quarter of a mile to the Southward of it there is an under-water ledge of rocks but otherwise the landing conditions are again similar. At one point there are two houses and a track leads down to the beach indicating that this is used as a landing place.

The coast road runs 200-400 yards from the shore at a height of 240-260 ft. above sea level.

Area No. 5.—South Coast: P. del ROSSO di NICO-Cala di LICATE.

Immediately South of the 400-ft. high cliffs which end at P. del ROSSO di NICO there is a section of coast half a mile long where there is no cliff and the land slopes down steeply to the sea at an average gradient of 1 in 4. There are no outlying rocks. South of this stretch there is a small sheltered cove on the Eastern shores of which landing conditions are similar.

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The coast road is not more than 150 yards inland.

There is no cliff except at one point where it is 80 ft. high.

Area No. 4.—South-West Coast: P. del ROSSO di NICO-Cala di LICATE.

Immediately South of the 400-ft. high cliffs which end at P. del ROSSO di NICO there is a section of coast half a mile long where there is no cliff and the land slopes down steeply to the sea at an average gradient of 1 in 4. There are no outlying rocks. South of this stretch there is a small sheltered cove on the Eastern shores of which landing conditions are similar.

Between this cove and the point where the cliffs recur a quarter of a mile to the Southward of it there is an under-water ledge of rocks but otherwise the landing conditions are again similar. At one point there are two houses and a track leads down to the beach indicating that this is used as a landing place.

The coast road runs 200-400 yards from the shore at a height of 240-260 ft. above sea level.

Area No. 5.—South Coast: Balata dei TURCHI-Cala ROTUNDA.

This stretch of coast is bounded by cliffs 60-250 ft. high. There are, however, two very narrow breaks in this cliff where the ground slopes down steeply to the sea. At the Western one of these a track leads down to the shore, indicating that it is used as a landing place.

Area No. 6.—East Coast: P. GADIR-Pta. RUBASACCHI.

Most of this area is bounded by cliffs but there are parts in which landing might be feasible over a rocky foreshore giving direct access to sloping ground leading up to the coast road. Above the 500-ft. level, which is about a quarter of a mile inland, the country is fairly thickly populated.

Area No. 7.—East Coast: Pta. RUBASACCHI-Cala di LEVANTI.

This area includes the small port or landing place at Cala di TRAMONTANA.

Except for that place and the sheltered cove, Cala di LEVANTI, to the Southward of it there are no possible landing places, for the coast is bounded by cliffs 60 ft. high.

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Area No. 8.—North Coast : P. GUARDIA-P. KARUSCIA.

In this area the coast is bounded by cliffs 20-60 ft. high except at one point, only 100 yards wide, where the land slopes down to the sea. There are under-water rocks in this vicinity.

The coast road runs only 100 yards from the sea at this point.

Area No. 9.—North Coast : Cala BUE MARINO-P. MORDONO.

This stretch of coast is faced with cliff or steep bank 40 ft. high and there is a submerged shelf of rock along the shore.

There is a small cove (Cala BUE MARINO) which should provide shelter except with a North wind but, unless there is a cliff path or steps, there is no method of getting inland from here.

The coast road runs close to the top of the cliff.

The coast to the West of this cove to the P. St. LEONARDO affords a possible landing beach but it is very close to the town.

See also Anchorages.

PISA, MARINA DI

(Lat. 43° 40' N., Long. 10° 18' E.)

(1) General Remarks

MARINA di PISA, situated about 7½ miles Northward of the Northern entrance to LIVORNO Harbour, is on the South side of the River ARNO (BOCCA d'ARNO) and extends about a mile South of the mouth of the river.

It is only a small watering place : an excessive number of visitors is deliberately discouraged on account of the King of ITALY'S summer residence being situated on the North side of the river.

It's interest is centred in the seaplane factory, which is possibly used also as an airport, at the North end of the village.

Anchorage

Temporary anchorage may be obtained off BOCCA d'ARNO on a sandy bottom. Too much reliance should not be placed on the inshore soundings shown on the chart, for the coast on either side of the mouth of the river is much subject to erosion, and in addition strong Westerly winds cause temporary changes in the sand fronting the high water mark. Depths in the river also vary greatly from season to season, but no more than 5 ft. can be expected and the depth may well be as little as 3 ft.

Conspicuous Objects

There are several conspicuous buildings, notably OSPIZIO MARINO—a large three-storied house—the large orphanage of PADRE AGOSTINO da MONTE FELTRO, sited 450 and 2,000 yards respectively South of the mouth of the river, and Villa SANTA, with a crenellated tower in the centre of the village.

Tide and Currents

The tidal range is little over one foot, but Westerly winds (Libeccio) will cause a temporary rise in sea-level, sometimes as much as 3 ft.

Weather

On-shore winds quickly raise a short, high, dangerous sea.

(2) Port Facilities

The river bank appears to be quayed for about 500 ft. West of what appears to be a derelict seaplane slip.

Two short breakwaters prolong the banks of the ARNO, the Northern arm being about 500 yards long and the Southern about 280 yards. An L-shaped groyne projects into the sea from MARINA di PISA for about 80 yards and then turns North for about 400 yards, almost

PISA, MARINA DI

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Temporary anchorage may be obtained off BOCCA d'ARNO on a sandy bottom. Too much reliance should not be placed on the inshore soundings shown on the chart, for the coast on either side of the mouth of the river is much subject to erosion, and in addition strong Westerly winds cause temporary changes in the sand fronting the high water mark. Depths in the river also vary greatly from season to season, but no more than 5 ft. can be expected and the depth may well be as little as 3 ft.

Conspicuous Objects

There are several conspicuous buildings, notably OSPIZIO MARINO—a large three-storied house—the large orphanage of PADRE AGOSTINO da MONTE FELTRO, sited 450 and 2,000 yards respectively South of the mouth of the river, and Villa SANTA, with a crenellated tower in the centre of the village.

Tide and Currents

The tidal range is little over one foot, but Westerly winds (Libeccio) will cause a temporary rise in sea-level, sometimes as much as 3 ft.

Weather

On-shore winds quickly raise a short, high, dangerous sea.

(2) Port Facilities

The river bank appears to be quayed for about 500 ft. West of what appears to be a derelict seaplane slip.

Two short breakwaters prolong the banks of the ARNO, the Northern arm being about 500 yards long and the Southern about 280 yards. An L-shaped groyne projects into the sea from MARINA di PISA for about 80 yards, and then turns North for about 400 yards, almost meeting the end of the South breakwater, thus forming a small camber. There is a fairly steep beach inside the camber. It is not known how seaplanes are launched, but it is possible they are launched down this beach, but, as there is shoal water just inside the camber mouth, this does not seem very likely.

A similar groyne, but with its Northerly arm only about 160 yards long, exists just South of the above. These and a rather intricate sea-wall built in front of the Northerly of two crescent-shaped gardens form a protection for the Northern 1,000 yards of the beach from the excessive coast erosion. In addition there appear to be the remains of groynes protruding into the sea for a further 700 yards to the South.

(3) The Town

The village of MARINA di PISA South of the seaplane factory forms a rectangle extending 2,500 yards Southwards from the ARNO and 300 yards inland. South and East of these limits there are pinewoods. There is no undergrowth, and the soil is sandy but marshy in winter.

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To a point 2,000 yards South of the ARNO there are, besides the main road to LIVERNO which runs along the seafloor, three wide streets parallel to it and frequently wide streets crossing them at right-angles. In the intervals between the streets there are gardens with trees, and the innermost of the four routes running parallel to the coast is well shaded by the forest.

(6) Aircraft Factories

Seaplane Factory

Costruzione Meccaniche Aeronautiche S.A. (Fiat).

The works cover an area of about 300 by 300 yards on the South bank of the mouth of the river ARNO. They are completely enclosed by a wall and buildings on the South and East, and by sea and river on the North and West. There is an entrance towards the East of the Southern boundary, which leads to a broad central avenue running through the works in a North-Westerly direction, and leading direct to the river front. On the West side of the avenue are two large buildings (about 45 by 125 yards and 85 by 125 yards); the latter is the assembly shop and hangars. No proper slipway or crane appears to exist. On the East of the central avenue running through to the road outside is a continuous series of workshops and administrative buildings. Power is derived from an outside source by an overhead line.

(7) Air Facilities

The seaplane factory is reputed to be used also as an airport.

(9) Power Plants

Power is introduced to the factory by overhead line, from some unknown outside source.

(10) Transport Facilities

Road

MARINA di PISA has been connected by a good road with PISA, 8 miles distant, for some time, but the road to LIVORNO by the coast is new. Both roads are regularly used by motor vehicles and allow two-way traffic, but the road to PISA shows signs of erosion by the river, 350 yards East of the war memorial, and it is reported that the ground on the left-hand bank between the mouth and S. Piero a Grado, 4 miles from the coast, is very low and is subject to inundations. There are no difficult gradients or turns.

The road to LIVORNO, tarmac but worn, diverges slightly from the coast at the Southern end of the village and then runs almost dead straight and flat through the pinewoods, with the electric railway from PISA to LIVORNO running parallel to it 100 yards on its inland side. About 1,000 yards from the coast, sometimes more sometimes less, cultivated reclaimed land succeeds to the pinewoods and extends to the road running South from S. Piero a Grado or to Canale dei Navicelli. Rough unmetalled forest tracks run parallel to each other North-East from the coast at intervals of 550 yards, crossing occasional ditches by strong one-way bridges, but there are no obstacles besides the woods themselves between the sea and the main road MARINA di PISA-LIVORNO.

About 5 miles South of the ARNO the road again comes very close to the sea; the woods recede, and bathing establishments recommence. One of these seaside establishments is a film studio. Five hundred yards from the river Calambrone the woods come to an end.

Alongside the bridge carrying the road across the CALAMBRONE there is on the inland side a narrower bridge carrying the electric railway. Two hundred and fifty yards upstream there is a third bridge carrying a road.

The whole road is, of course, vulnerable from the sea.

(12) Defences

MARINA di PISA is included in the Defence Scheme of LIVORNO. (See also Plan 15.)

(13) Reconnaissance

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(13) Reconnaissance

Landing with A.L.C.s and the like would best be effected in BOCCA d'ARNO, either in the grounds of the seaplane factory or on the river bank immediately East of the factory. In the former case the derelict seaplane slip or a curious projection 100 yards farther East would appear the best places; in the latter the best place would be between two sheds on the line prolonging the road by the war memorial (East of this the river bank appears rough and broken).

The alternative to landing in the river is to land on the beach in front of the village itself. The average gradient for 1,200 yards South of the river mouth varies between 1:40 and 1:32; immediately South of the village where the coast road branches slightly inland the gradient is about the same. A study of the air photographs indicates that the best landing is either 1,000 or 1,700 yards South of river mouth. At the former the sea-wall or bank appears to be very low; at the latter there seems to be no wall at all.

Generally speaking, the road runs through the village at a height of about 10 ft. above sea-level, and in many places it has been reinforced in a rough way with loose stones. South of the village the beach is backed by low sand dunes covered with scrub.

PISA, MARINA DI
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The seaward approach to BOCCA d'ARNO and to the beach is clear of danger but rather shoal, the 10-fathom and 6-fathom contours lying 4 and 1½ miles respectively from the shore. The deeper water in the entrance appears to be close to the Northern breakwater.

Exits

The road between MARINA di PISA and PISA, close to which runs an electric railway, skirts the South bank of the Arno until it reaches the Eastern boundary of the seaplane factory (there are definite signs that this road is suffering from erosion of the river bank); it then turns Southwards and runs along the boundary and straight on to the Northerly of two crescent-shaped gardens, which are on the shore about 700 yards South of the river mouth. From there the road runs in front of the village along the shore towards LIVORNO. This road also extends along the beach to the North as far as the South-Western corner of the seaplane factory. Except for the landing in the grounds of the seaplane factory, exits from the landing-places would be directly on to this road.

Access to LIVORNO may be obtained either by the road mentioned above, which has only recently been completed, or by the road from PISA to LIVORNO, passing through S. PIERO A GRADO, which is connected to the road running along the South bank of the ARNO by two short roads branching off from the ARNO road at points 4,800 yards and 6,300 yards respectively from the river mouth. Both these short roads run to S. PIERO A GRADO.

The seaplane factory could be isolated by machine-gun fire raking the straight section of road running from the war memorial South-West to the Northern-most of the two crescents. The buildings at the North-West outskirts of the forest about 300 yards from the ARNO also occupy a commanding position.

POLA AND THE BRIONI ISLANDS

(Lat. 44° 52' N., Long. 13° 50' E. (POLA NAVAL YARD))
(See Plans 52, 54 and 55)

(1) General Remarks.

POLA

POLA was formerly the chief Naval Port of AUSTRIA-HUNGARY. It is now a Naval Training Centre. It is not used by the main squadrons, but it appears to be kept in a state of readiness, both as regards its repair equipment and defences.

Early in 1939 a Submarine Base, on a large scale, was organized here, and about one-third of the Italian Submarines can be accommodated; it is, at present, used as a base for the Submarine Training Flotilla, and is also used by German and Italian Submarines undergoing repairs.

The Commercial Port, which is situated to the Eastward of OLIVI Island, is small and unimportant, as the trade of the upper ADRIATIC is carried on at TRIESTE and FIUME. The Italians are endeavouring to remedy this state of affairs.

BRIONI Islands

This group of islands lies North-Eastward of the entrance to POLA Harbour parallel with the coast and separated from it by Canale di FASANA. They are composed of marble and are covered with thick bushes and low trees and their coasts are indented with many little bays and inlets.

(2) Port Facilities.

There are ample facilities for embarking and disembarking troops.

Lifting Appliances.

One small Handworked Crane, capacity 2 to 5 tons, situated on the Torpedo Depot Quay.
One Floating Crane, 5 to 10 tons capacity.

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One Floating Crane, 5 to 10 tons capacity.
Two Floating Gantries, one of 100 tons, and one of approximately 20 tons capacity.
One ex-Austrian Floating Crane, lifting capacity of 500 tons. It is moored alongside in the vicinity of the Coaling Pier.
Details concerning docks are given in paragraph (4) and Section V(2).

(3) The Town

See Plan 55.

POLA has a population of about 60,000 and is built on the Southern side of the inner harbour. It is one of the most ancient towns in ISTRIA. Amongst other Roman remains is the amphitheatre which is built of white marble. The Cathedral is Ninth Century.

Hospitals

The Naval Hospital is sited South of the town between Via PLINIO and Via del OSPEDALE.

There is a Civil Hospital North-East of and adjoining M.S. MICHELE and another on Via GIOVIA, South-East of the Arena.

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Observatory

The Observatory stands in the immediate Eastern suburb of the town.

Gasworks

The Gasworks are sited between Via CONTENTO and Via VERGERIO.

Water

(i) *POLA*.—There are two Main Town Reservoirs: one is sited at M. GHIRO, to the North of the town with a Pumping Station about 1,500 yards further North; the other is at the South end of the town at a point on Via dell AMIRACLIATO 200 yards South-East of the junction of that road with Via M. PARADISO.

At CASTELLO, in the West centre of the town, opposite OLIVI Island, there is a Water Reservoir and a Pumping Station; there are also Water Works adjoining and North of the Port Office.

(ii) *BRIONI Islands*.—*Aqueduct*.—There is a Submarine Aqueduct from FASANA to CATENA Bay in BRIONI Grande which supplies that Island with water.

(4) Government Establishments

Naval Arsenal

There has been no ship construction in this once important yard for many years with the result that many specialised workmen have emigrated. There are said to be now not more than about 200 in the town. These are employed on repair and overhaul work on small naval vessels. It is to this work and to the maintenance of the permanent defences of the port that the capabilities of the Dockyard are limited.

The old Naval Yard on OLIVI Island is leased to CANTIERE SCOGLIO, a private Docking and Repair firm affiliated to CANTIERI RIUNITI DELL ADRIATICO. This is described under paragraph (5) COMMERCIAL ESTABLISHMENTS.

Naval Base

The Naval Base is sited on the South side of the harbour. Here there are berths for Destroyers and Submarines, a Coal Depot, a Seamen's Training Establishment, a Laboratory and various other buildings.

There is a Naval Club at the entrance to the Dockyard immediately South of the Admiral's Offices.

There is a Research and Experimental Centre for Optical Services of the Navy: experimental work on optical instruments and training of rangefinders and others in their use and maintenance are its principal functions. It is probable that the establishment is in the Dockyard.

C.R.E.M. School

The School occupies the area between Via DAM CHIESA, Via ERNESTO GRAMMATICO POLO, VIALE BATTISTI and VIALE FILZI in the Dockyard. The Piazzale Commdt. MIRAGLIA is the parade ground: there is a large recreation shed with an arched roof at the South-Western end. The Cruiser "TARANTO," which is used as an overflow Depot, and two training brigs lie stern on to this quay.

There are nearly 4,000 volunteer youths under training and a small number of conscripts.

Clothing Workshop

The Naval Clothing Workshop and Shoe Factory is sited on Via della SPECULA. Here are made the uniforms for the greater part of the Italian Navy. The Shoe Factory turns out about 200 pairs of shoes or boots per day.

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Garrison Victualling Stores

These are sited on the South side of Via SIANA.

There is also a Wine Store at STOJE di MUSIC in an old disarmed fortress.

Artillery School

There are Artillery and Range Finder Schools at FORT MARIA LOUISE.

Artillery Laboratory

This is sited at the Southern point of ZONCHI Bay.

Artillery Workshop

This is sited North of S. PIETRO Bay.

Naval Artillery Laboratory

This is sited North of M. GHIRO.

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Boom Defence Depots

- (a) What appears to be a Boom Defence Depot is sited in VERGAROLA Bay: there are a number of store sheds and buoys.
- (b) In FIGO Bay there is an establishment consisting of some small low buildings—one detached—with two rusty chimneys which may be connected with Boom Defence gear.

Mining Depot

An Establishment, with quays, 3 small piers and cranes, which may be a Mining Depot, is sited in ZENO Bay.

Barracks

- (a) Large Naval Barracks with a drill ground to the South of the buildings lie on Via della SPECULA. There are further Naval Barrack buildings on the West side of the drill ground with a parade ground on their North-West side.
- (b) There are Naval Barracks at the Seamen's Training Establishment to the West of the Naval Base.
- (c) Infantry Barracks on Via SALOAME, to the South of the town.
- (d) Artillery Barracks—to the East of and adjoining M. MONVIDAL.
- (e) MAX Barracks—sited 600 yards West of the Seamen's Training Establishment.
- (f) Infantry Barracks—on Piazza Porta S. GIOVANNI.

(5) Commercial Establishments*Docking and Repairs*

CANTIERE SCOGLIO is a private docking and repair firm affiliated to CANTIERI RIUNITI dell' ADRIATICO: the repair shops are used by Germans for repair work on Submarines.

Building Slips

There are four Building Slips: on two of these ships of 25,000 tons can be built and, on the other two, ships of 8,000 tons.

Dry Docks

There are two Dry Docks of the following dimensions:—

	Extreme Length	Length on Bottom	Width	Depth at Sill
No. 1	453'	410'	78'	26'
No. 2	402'	350'	86'	30'

There is also a Dry Dock specially designed for docking the Floating Dock, with dimensions: Length, 546 ft.; width, 171 ft. 3 in.; depth at bottom, 7 ft. 9 in.

Floating Dock

There is a Floating Dock (No. 10) of dimensions 311 ft. by 53 ft. by 16 ft. (blocks). It will lift a ship of 15,000 tons.

Previous to 1938 there was a larger Floating Dock at POLA. It can lift a ship of 21,500 tons. It was then taken to TRIESTE where the DORIA was docked in it. It is believed to be still at TRIESTE. Dimensions:—

Extreme length	Length on blocks	Width at bottom	Width at top	Clear Width	Depth on blocks	Depth on bottom
584'	538'	94'	118'	110' 7"	35' 6"	39' 6"

the Naval Base.

- (c) Infantry Barracks on Via SALOAME, to the South of the town.
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584'	538'	94'	118'	110' 7"	35' 6"	39' 6"

Cement Works

There are large Cement Works on S. PIETRO Peninsula.

Fuel Storage

There are 12 large cylindrical Oil Tanks at the head of ZONCHI Bay (see Plan 54). The Tanks, which are painted green, are in two groups. The Eastern group consists of eight Tanks of capacity 4,000 tons each. The Western group, distant 200 yards, contains four Tanks, of about 5,000 tons each. The Oiling Pier is about 100 ft. long. There is a buoy off GROSSO Point which may either carry the end of a flexible oiling pipe or which may be used for securing ship using the installation.

There are large petrol dumps at Fort CERZLA.

Coal

At M. ZELINA there is a Coal Depot for POLA Gasworks.

(C46758)

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(6) Aircraft Factories

Believed none.

(7) Air Facilities

Seaplane Stations

There is a well-equipped Seaplane Station at SANTA CATERINA Island in the Harbour. There are three corrugated iron Seaplane Hangars. In October, 1930, it was reported that much expansion was in evidence, with the object of establishing a powerful Air Base in the neighbourhood.

The new Seaplane Station in RONZI Bay, known officially as PONTISELLA, has been completed. There are five large Hangars, four Slipways and three Cranes with a lifting capacity each of approximately 10 tons. The Hangars are made of corrugated iron and, it is estimated, could each accommodate at least nine Flying Boats of the "Savoia Marchetti" S.55 type.

It is estimated that there are 29 Seaplanes of the S.55 type. Arrangements exist for night landing.

Excellent arrangements for accommodation of personnel and stores have been made.

(8) War Material Factories

There is an Ammunition and Artillery Depot on the North shore of the Harbour.

(9) Power Plants

There is a Power Station in the Dockyard on the mainland.

There is a small Power Station situated where Road No. 6 via PROMONTORE (Plan No. 55) bends in a South-Easterly direction after passing through an open square.

(10) Transport Facilities

Sea Transport

POLA is in connection with ADRIATIC Ports by sea. The details are as follows:—

1. POLA to VENICE		Thrice weekly each way.
2. POLA to FIUME		Four times weekly.
3. FIUME to POLA		Daily except Sunday.
4. POLA to TRIESTE		Daily each way.
5. POLA to ANCONA		Twice weekly each way.
6. POLA to BRIONI		Twice daily each way.

Once a week the steamers to and from TRIESTE and GRUZ call at POLA. Once a week steamers from VENICE to and from BRINDISI and SANTA MAURA call at POLA. Hence POLA is in communication with the Ports at which these steamers call. These are:—

ZARA.	KORCULA.	SANTA QUARANTE.
LUSSIN PICCOLO.	KOTOR.	CORFU.
SIBENIK.	DURAZZO.	PREVESE.
SPLIT.	VALONA.	LAGOSTA.
BARI.	ANTIVARI.	S. GIOVANNI.

The large steamers from TRIESTE and VENICE to AMERICA, INDIA and CHINA do not call at POLA.

Railway

To TRIESTE only with a branch line to REVIGNE on the coast.

Air Facilities

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The large steamers from TRIESTE and VENICE to AMERICA, INDIA and CHINA do not call at POLA.

Railway

To TRIESTE only with a branch line to REVIGNE on the coast.

Air Facilities

An Airport has been constructed and though there is no Commercial Air Service with POLA itself, there is a Flying Boat Service which includes BRIONI. It is run by the SOCIETA ITALIANA SERVIZI AEREI-TRIESTE.

There are two lines, one from FIUME to VENICE and one from TRIESTE to ANCONA.

(11) Signal Communications

W/T Stations

The Station using call sign L.Q.Z. (see W/T Board List of Wireless Stations and Call Signs—C.B. Series) and carrying out Naval work, is the former Austrian Naval High Power Station at the head of the Harbour at CAISOLE. The lattice work tower supporting the six aeriels is clearly visible from the Westward.

Cables

There is a submarine telephone cable connecting POLA with BRIONI GRANDE : it lands at the Southern point of RANCON Bay.

POLA 275

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

- Battery No. 1. *FORT PARAVIA*. Two guns of 12-in. calibre, four guns of 5.9-in. calibre, and four guns of 8-in. calibre (mortars).
- Battery No. 2. *FORT FORNO*. Two guns of 12-in. calibre, four guns of 5.9-in. calibre, and four guns of 8-in. calibre (mortars).
- Battery No. 3. *FORT BENEDETTO*. Two guns of 12-in. calibre, four guns of 5.9-in. calibre, and four guns of 8-in. calibre (mortars).
- Battery No. 4. *BRIONI PICCOLO*, north of Hill 59. Two guns of 8-in. calibre, four guns of 6-in. calibre.
- Battery No. 5. *BRIONI PICCOLO*, summit of Hill 84. Two guns of 12.6-in. calibre.
- Battery No. 6. *FORT TEGETHOFF*, on the north-west slopes of the mountain. Four howitzers of 6-in. calibre, four guns of 8-in. calibre (mortars).
- Battery No. 7. *GROSSO POINT (SCOGLOGRANDE)*. Two guns of 12.6-in. calibre.
- Battery No. 8. *PENEDA POINT*. Two guns of 12-in. calibre and four guns of 3.9-in. calibre facing east.
- Battery No. 9. *CAVARELLA* (north side of Terra Alta Bay). Four guns of 5.9-in. calibre.
- Battery No. 10. *CRISTO POINT*, on the mainland above *FORT CRISTO*. Two howitzers of 11-in. calibre, facing west and south and north.
- Battery No. 10A. *PORT VAL MAGGIORE*. Two guns of 11-in. calibre, facing south and west.
- Battery No. 11. *FORT CASTELLIER*. Six guns up to 5.9-in. calibre.
- Battery No. 12. *FORT CERELLA*. Six guns up to 5.9-in. calibre.
- Battery No. 13. *FORT MARIA LOUISE*. Four guns of 11-in. calibre, facing west.
- Battery No. 14. *FORT MUSIL*. Six guns of 6-in. calibre, facing south-west.
- Battery No. 15. *OVINA*, just north of *OVINA Bay*. Two guns of 11-in. calibre, facing south and west.
- Battery No. 16. *SAN GIOVANNI POINT*. Two guns of 11-in. calibre, two guns of 9.6-in. calibre.
- Battery No. 17. *VERUDELLA POINT*. Two guns of 11-in. calibre, facing south-east and west.
- Battery No. 18. *MALCABOJA*, on hill north of *MALCABOJA Bay*. Two guns of 9.2-in. or 12-in. calibre.
- Battery No. 19. *MONTE COPE*. Four guns of 6-in. calibre.

(c) Local Defences

STANDREA Island is strongly defended with barbed wire entanglements and is unapproachable: it is also land-mined.

(g) Magazines, etc.

- (1) *GIORGETTO*: 6 cables East-South-East from *M. CAISOLE*—an underground Dynamite Store.
- (2) On East side of State Forest—a large Naval Ammunition Dump with 16 flat roofs covered with grass.
- (3) To the East of *FUORA Bay*—an underground Ammunition Dump covered with grass.
- (4) *FOIBON*—a Powder Magazine, partly underground, with a grass-covered top.

(iii) Searchlights

- Battery No. 7. *GROSSO POINT* (SCOGLOGRANDE). Two guns of 12.6-in. calibre.
- Battery No. 8. *PENEDA POINT*. Two guns of 12-in. calibre and four guns of 3.9-in. calibre facing east.
- Battery No. 9. *CAVARELLA* (north side of Terra Alta Bay). Four guns of 5.9-in. calibre.
- Battery No. 10. *CRISTO POINT*, on the mainland above *FORT CRISTO*. Two howitzers of 11-in. calibre, facing west and south and north.
- Battery No. 10A. *PORT VAL MAGGIORE*. Two guns of 11-in. calibre, facing south and west.
- Battery No. 11. *FORT CASTELLIER*. Six guns up to 5.9-in. calibre.
- Battery No. 12. *FORT CERELLA*. Six guns up to 5.9-in. calibre.
- Battery No. 13. *FORT MARIA LOUISE*. Four guns of 11-in. calibre, facing west.
- Battery No. 14. *FORT MUSIL*. Six guns of 6-in. calibre, facing south-west.
- Battery No. 15. *OVINA*, just north of *OVINA Bay*. Two guns of 11-in. calibre, facing south and west.
- Battery No. 16. *SAN GIOVANNI POINT*. Two guns of 11-in. calibre, two guns of 9.6-in. calibre.
- Battery No. 17. *VERUDELLA POINT*. Two guns of 11-in. calibre, facing south-east and west.
- Battery No. 18. *MALCABOJA*, on hill north of *MALCABOJA Bay*. Two guns of 9.2-in. or 12-in. calibre.
- Battery No. 19. *MONTÉ COPE*. Four guns of 6-in. calibre.

(e) *Local Defences*

STANDREA Island is strongly defended with barbed wire entanglements and is unapproachable: it is also land-mined.

(g) *Magazines, etc.*

- (1) *GIORGETTO*: 6 cables East-South-East from *M. CAISOLE*—an underground Dynamite Store.
- (2) On East side of State Forest—a large Naval Ammunition Dump with 16 flat roofs covered with grass.
- (3) To the East of *FUORA Bay*—an underground Ammunition Dump covered with grass.
- (4) *FOIBON*—a Powder Magazine, partly underground, with a grass-covered top.

(iii) *Searchlights*

Searchlights have been observed in the following positions:—

- (a) On Mt. *BENEDA*.
- (b) On the Point to the Eastward of *TERRA ALTA Bay*.
- (c) On the Point to the Westward of *SANADIGO Bay*.
- (d) At *FORT TEGGETHOFF*.
- (e) *MARIA LOUISE Battery*.
- (f) *FORT MUSIL*.
- (h) *VERUDELLA Point*.
- (i) *BARBARIGA Point*.

(iv) *Local Seaward Defences*

Minefields.

It is probable that the laying of a Minefield in the approaches is part of the scheme of defence.

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Torpedo Batteries

Four (?) 14-in. Torpedo Tubes are mounted in a shelter to eastward of SANADIGO Bay. The Tubes, which are on a fixed bearing of 045°, are mounted in a shelter and concealed from view by two iron doors which open out to seaward.

There is stowage for eight torpedoes.

SCOGLIO MINOR: Sited on the South-Eastern point directed towards FASANA—four Torpedo Tubes.

Booms and Nets

Arrangements exist for enclosing the area marked "Prohibited Area" on Plan 54 by means of a Boom Defence. The nets are reported to be stored in the Dockyard: one Boom extends from MARBON PT. on SCOGLIO GRANDE Island to FRAGIACOMO and others join GIRLAIN and COSADA Islands to each other, the mainland, and SCOGLIO GRANDE Island.

Nets, the nature of which is unknown, have also been placed between the head of the mole which runs out from C. COMPARE and CRISTO Point. The nets are said to have been moored so that, in case of need, they can be quickly raised and tightened. There is another net across the small bay where the Ammunition and Artillery Depôts are sited.

(v) Local Air Defences

A.A. Batteries

- A.A. Battery No. 1. FORT PARAVIA. Four A.A. guns of 3-in. calibre.
- A.A. Battery No. 2. FORT FORNO. Four A.A. guns of 3-in. calibre.
- A.A. Battery No. 3. FORT BENEDETTO. Four A.A. guns of 3-in. calibre.
- A.A. Battery No. 3A. BRIONI PICCOLO. Mounted on ANTILENA Point. Four guns of 3-in. calibre.
- A.A. Battery No. 4. GROSSO PT. (SCOGLIO GRANDE). Two A.A. guns of 3-in. calibre.
- A.A. Battery No. 4A. FORT PENEDA. Four guns of 3-in. calibre.
- A.A. Battery No. 5. CAVAROLLA. Two A.A. guns of 3-in. calibre.
- A.A. Battery No. 5A. FORT MARIA LOUISE. Four guns of 3-in. calibre.
- A.A. Battery No. 6. FORT MAX. (?) A.A. guns of (?) 3-in. calibre.
- A.A. Battery No. 7. CASTELLO. (?) A.A. guns of (?) 3-in. calibre.
- A.A. Battery No. 8. ST. ANDREA ISLAND. (?) A.A. guns of (?) 3-in. calibre.
- A.A. Battery No. 9. STA. CATERINA. (?) A.A. guns of (?) 3-in. calibre.
- A.A. Battery No. 9A. MAIN RAILWAY STATION. (?) Four guns of (?) 3-in. calibre.
- A.A. Battery No. 10. MT. CAISOLE. (?) A.A. guns of (?) 3-in. calibre.
- A.A. Battery No. 11. CRISTO POINT, on the mainland above FORT CRISTO (?) A.A. guns of (?) 3-in. calibre.

North of LUNGA Bay there is an old fortress which has an emplacement for A.A. Battery.

(viii) Garrison

About 300 men, under a Captain, R.I.N., form the peace establishment of the Defence Organisation.

(13) Reconnaissance

There is a lack of suitable landing places on SCOGLIO MINOR and SCOGLIO GRANDE owing to the rocky nature of the coast. The following were observed from seaward:—

Position. Approximate length of beach.

Nets, the nature of which is unknown, have also been placed between the head of the mole which runs out from C. COMPARE and CRISTO Point. The nets are said to have been moored so that, in case of need, they can be quickly raised and tightened. There is another net across the small bay where the Ammunition and Artillery Depôts are sited.

(v) *Local Air Defences*

A.A. Batteries

- A.A. Battery No. 1. FORT PARAVIA. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 2. FORT FORNO. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 3. FORT BENEDETTO. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 3A. BRIONI PICCOLO. Mounted on ANTILENA Point. Four guns of 3-in. calibre.
 A.A. Battery No. 4. GROSSO PT. (SCOGLIO GRANDE). Two A.A. guns of 3-in. calibre.
 A.A. Battery No. 4A. FORT PENEDA. Four guns of 3-in. calibre.
 A.A. Battery No. 5. CAVAROLLA. Two A.A. guns of 3-in. calibre.
 A.A. Battery No. 5A. FORT MARIA LOUISE. Four guns of 3-in. calibre.
 A.A. Battery No. 6. FORT MAX. (?) A.A. guns of (?) 3-in. calibre.
 A.A. Battery No. 7. CASTELLO. (?) A.A. guns of (?) 3-in. calibre.
 A.A. Battery No. 8. ST. ANDREA ISLAND. (?) A.A. guns of (?) 3-in. calibre.
 A.A. Battery No. 9. STA. CATERINA. (?) A.A. guns of (?) 3-in. calibre.
 A.A. Battery No. 9A. MAIN RAILWAY STATION. (?) Four guns of (?) 3-in. calibre.
 A.A. Battery No. 10. MT. CAISOLE. (?) A.A. guns of (?) 3-in. calibre.
 A.A. Battery No. 11. CRISTO POINT, on the mainland above FORT CRISTO (?) A.A. guns of (?) 3-in. calibre.

North of LUNGA Bay there is an old fortress which has an emplacement for A.A. Battery.

(viii) *Garrison*

About 300 men, under a Captain, R.I.N., form the peace establishment of the Defence Organisation.

(13) *Reconnaissance*

There is a lack of suitable landing places on SCOGLIO MINOR and SCOGLIO GRANDE owing to the rocky nature of the coast. The following were observed from seaward:—

	Position.	Approximate length of beach.	
A	44° 56' 8" N., 13° 44' 2" E.	100 yards	
B	44° 55' 58" N., 13° 43' 52" E.	100 yards	
C	44° 55' 14" N., 13° 44' 30" E.	150 yards	
D	44° 54' 20" N., 13° 45' 0" E.	(?)	There is a jetty 50 yards long.
E	44° 53' 40" N., 13° 45' 13" E.	400 yards	
F	44° 53' 20" N., 13° 45' 8" E.	300 yards	
G	44° 53' 24" N., 13° 45' 15" E.	300 yards	
H	44° 54' 14" N., 13° 45' 32" E.	(?)	
J	44° 54' 20" N., 13° 45' 50" E.	250 yards.	
K	44° 54' 20" N., 13° 46' 25" E.	(?)	
L	44° 54' 30" N., 13° 46' 48" E.	50 yards.	

The letters shown against each position are marked on Plan 54 to allow of quick reference.

PONZA ISLAND

(Lat. 40° 54' N., Long. 12° 58' E.)

(See Admiralty Chart 1733)

(1) General Remarks

Description

PONZA, population about 6,000, is the largest island in the group known as ISOLE PONTINE, situated about 60 miles West of NAPLES.

It is 4 miles long with an average width of half a mile, is rocky, high and of irregular outline: MONTE GUARDIA, 923 ft. high, at its Southern end, is the highest point.

The use of the harbour, Porto di PONZA, as a base for M.A.S. has been reported.

There is a penal colony on the island.

Local industry consists principally in fishing, agriculture and making wine.

Anchorage

West Coast.—Vessels with local knowledge can anchor in CALA dell' ACQUA about 2 cables from PUNTA del PAPA, a little inside the line joining that point to CAPO BOSCO, in about 11 fathoms. A small vessel could anchor further in on the Northern side of the cove in 3 fathoms, about half a cable off-shore.

A small vessel can find anchorage in CALA FEOLA in 5 fathoms, sand and weed with good holding ground, opposite two groups of houses high up on the slope; and in CALA CHIALLA di LUNA in 5 fathoms, 4 cables from the head of the bay, and in 3 fathoms 1½ cables from it.

East Coast.—There is anchorage, in depths of from 5½ to 14 fathoms, weed, between lines drawn from ROTONDA della MADONNA light-tower to Scoglio RAVIA, and from the head of the mole to the middle of SPIAGGIA di SANTA MARIA.

In North-Westerly winds it is preferable to anchor in the Southern part of the anchorage where the holding ground is better. In winter, during Northerly winds, this anchorage is dangerous.

Small vessels can anchor in depths of from 3½ to 3¾ fathoms in line with the mole.

With strong Westerly winds good anchorage can be found in CALA del FRONTONE.

Tides and Currents

During the winter the current in the anchorage off PUNTA del PAPA usually sets against the wind.

Currents in PORTO di PONZA are influenced by the wind.

In the channels between the islands, especially between ISOLOTTO di GAVI and ISOLA di ZANNONE, the current sometimes runs strongly during spring tides.

Conspicuous Objects

These include PUNTA della GUARDIA light-tower, on the Southern extremity of the island, ROTONDA della MADONNA light-tower, the Molehead light-tower, the cupola of the church and the quadrangular castle.

(2) Port Facilities

PORTO di PONZA

PORTO di PONZA lies on the Southern side of CALA di PONZA and is protected from the Northward by a mole, which is quayed on its inner side, on which are stone mooring posts. It has landing steps on its head where there is a depth of 13 ft.

Local industry consists principally in fishing, agriculture and making wine.

Anchorage

West Coast.—Vessels with local knowledge can anchor in CALA dell' ACQUA about 2 cables from PUNTA del PAPA, a little inside the line joining that point to CAPO BOSCO, in about 11 fathoms. A small vessel could anchor further in on the Northern side of the cove in 3 fathoms, about half a cable off-shore.

A small vessel can find anchorage in CALA FEOLA in 5 fathoms, sand and weed with good holding ground, opposite two groups of houses high up on the slope; and in CALA CHIAIA di LUNA in 5 fathoms, 4 cables from the head of the bay, and in 3 fathoms 1½ cables from it.

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There is a breakwater close Northward of and parallel with the mole.

A quay called PRINCIPE di NAPOLI, with stone mooring posts, borders the Eastern part of the port.

There is a depth of 21 ft. in the middle of the harbour, decreasing gradually to 7 ft. near the quay and mole.

Sailing vessels secure their sterns to the quay fronting the village.

Berths at the mole are reserved for Government craft.

Cala INFERNO

In Cala INFERNO, close South-Westward of Scoglio EVANGELISTA, there is a landing at the head of the cove where there is a natural quay and landing steps cut in the cliff.

(3) The Town

The village, which has a population of about 2,800, is situated South-Eastward of the port.

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PONZA ISLAND
27S REGGIO DI CALABRIA, PORTO DI

(7) Air Facilities

Seaplane Alighting Area

Seaplanes alight in the area to the Eastward of the line joining Punta TORRIONE and Scoglio SOTTO TORRE; the Northern limit of the area is Scoglio RAVA and the Eastern limit a line drawn Northwards from Scoglio ROSSO.

(10) Transport Facilities

Sea

There is regular steamer communication with Italian ports.

(11) Signal Communications

V/S

There is a signal station on the summit of MONTE della GUARDIA.

Cable

There is cable communication with ITALY: cables are landed at SPIAGGIA di SANTA MARIA.

(12) Defences

It has been reported that fortifications, underground galleries and air-raid shelters are under construction: no details available.

REGGIO DI CALABRIA, PORTO DI

(Lat. 38° 07' N., Long. 15° 39' E.)

(See Plan 109 and Admiralty Chart No. 188.)

(1) General Remarks

REGGIO is situated seven miles South-Eastward of MESSINA.

It is of interest as being one of the terminals of the MESSINA-VILLA SAN GIOVANNI-REGGIO Train Ferry Service between the Mainland and SICILY.

(2) Port Facilities

REGGIO is classified as an "E" Anchorage.

Moles and Quays

PORTO di REGGIO consists of an artificial basin, protected from the Westward by a mole which extends about a quarter of a mile Northward from the coast at the Northern end of the town: the inner side of this mole is quayed, and carries a branch of the Railway.

Cranes

A floating Crane, lift not known, is in the Harbour.

Estimated Daily Capacity

1,000 d.w. tons stores. This excludes the rail ferry service, and provision for M/T, of which for every 25 vehicles unloaded the amount of Military Stores would be reduced by 100 tons.

Water

Water is laid on to all quays.

Berthing Cradle for Train Ferry

A berthing cradle for the Train Ferry from MESSINA is sited at the South-Western corner of the harbour.

Berths for Ships and Depths Alongside

Cable
There is cable communication with ITALY: cables are landed at SPIAGGIA di SANTA MARIA.

(12) **Defences**

It has been reported that fortifications, underground galleries and air-raid shelters are under construction: no details available.

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(See Plan 109 and Admiralty Chart No. 188.)

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1,000 d.w. tons stores. This excludes the rail ferry service, and provision for M/T, of which for every 25 vehicles unloaded the amount of Military Stores would be reduced by 100 tons.

Water

Water is laid on to all quays.

Berthing Cradle for Train Ferry

A berthing cradle for the Train Ferry from MESSINA is sited at the South-Western corner of the harbour.

Berths for Ships and Depths Alongside

Vessels drawing more than 23 ft. must lie some distance off the quays.

There are depths of 24 ft. alongside the Southern Quay and for some few yards from it, increasing to 33 ft. towards its Eastern end.

Alongside both the Western Mole and the Eastern Quay a vessel is sheltered from all winds.

Alongside the Southern Quay onshore winds send in a short uncomfortable sea.

In winter vessels moor with two anchors before securing to any of the quays: good holding ground.

Anchorage

There is an anchorage in depths of from 14 to 16 fathoms in the small bight of MONSOLINI, close Southward of the mouth of Torrente ANNUNZIATA, half a cable off shore.

This anchorage is sheltered from winds between North and East but is untenable in strong winds from other directions.

The harbour is accessible to a small cruiser.

(3) **The Town**

REGGIO is a large town with a population of 45,000. Industries include the extraction of the essences of oranges, lemons and bergamot; the rearing of silkworms and the weaving of silk; and the production of oil, wine and fruit. The fishing industry is active, especially between April and June.

Exports include vegetables, oil, wine, etc. Imports are cement, timber, coal, etc.

Hospitals

There is a civil and several other hospitals in the town.

(4) **Government Establishments**

Barracks

On the Southern outskirts of the town, about one mile North of the Northern boundary of the aerodrome, there are four blocks of barrack buildings under construction. Position: Lat. $38^{\circ} 05' 40''$ N., Long. $15^{\circ} 38' 50''$ E.

Oil Storage

There are three circular buried oil storage units (diameter approximately 100 ft. each) on the Northern outskirts of the town. They are camouflaged to resemble cultivated ground.

(5) **Commercial Establishments**

Coal

A stock of coal is maintained.

Repairs

Small repairs to hull and machinery can be executed.

(7) **Air Facilities**

There is an operational aerodrome about three miles South by West of the harbour. Position: Lat. $38^{\circ} 04' 25''$ N., Long. $15^{\circ} 38' 50''$ E. Average measurement 1,500 by 900 yards. There are two hangars, the smaller in the South-East corner, the larger, measuring about 180 ft. by 120 ft., is in the centre of the Eastern boundary.

(10) **Transport Facilities**

Road

REGGIO is on the Main Coastal Road which runs near the coast all round the "Toe" of Italy.

There is a minor road which leaves the centre of the town Eastward then trends North-East to CERASI.

Rail

REGGIO is on the Main Coastal Railway which runs near the coast all round the "Toe" of Italy.

Train Ferry

At REGGIO is one of the terminals of the Train Ferry from MESSINA.

The landing Bay is situated close Eastward of the root of the breakwater and is indicated on Chart 188. It is a single terminal.

Vulnerable Point on Railway

See Section IV (3): Area "C": Section VI and Plan S7: a bridge.

(12) **Defences**

(i) *Sea Front Defences*

(a) *Coast Defence Batteries*.—Guns of (?) 11-in. calibre are mounted at REGGIO: sites

There are three circular buried oil storage units (diameter approximately 100 ft. each) on the Northern outskirts of the town. They are camouflaged to resemble cultivated ground.

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Small repairs to hull and machinery can be executed.

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There is an operational aerodrome about three miles South by West of the harbour. Position: Lat. 38° 04' 25" N., Long. 15° 38' 50" E. Average measurement 1,500 by 900 yards. There are two hangars, the smaller in the South-East corner, the larger, measuring about 180 ft. by 120 ft., is in the centre of the Eastern boundary.

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Road

REGGIO is on the Main Coastal Road which runs near the coast all round the "Toe" of Italy.

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The landing Bay is situated close Eastward of the root of the breakwater and is indicated on Chart 188. It is a single terminal.

Vulnerable Point on Railway

See Section IV (3) : Area "C" : Section VI and Plan 87 : a bridge.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries.—Guns of (?) 11-in. calibre are mounted at REGGIO : sites not known.

(iv) Local Seaward Defences

The Northern entrance to the harbour is protected by a boom moored to two buoys. This boom is not kept permanently in place.

(v) Local Air Defences

(a) A.A. Batteries

Battery No. 1 : 1 mile North-East of S. CATERINA Railway Station : 4—? calibre (probably heavy). R.2, 1942.

Battery No. 2 : 1½ mile South-South-East of REGGIO di CALABRIA : 4—? calibre (heavy). A.2, 1942.

(vi) Land Defences

There are two forts on the slopes of the hills North-East of the harbour. No further particulars known.

RIVA TRIGOSO

(Lat. 44° 15' N., Long. 9° 25' E.)

(See Plan 77)

(5) Commercial Establishments*Shipyard of the Cantieri Del Tirreno*

This Yard, which is situated midway between GENOA and SPEZIA, is capable of undertaking the construction of anything from a Tugboat to a Warship. The total area occupied by the establishment is approximately 1,722,288 square ft., of which 645,858 are covered by Engineers' Shops, Offices and Yard accommodation for stocks of material and general assembling. The site of the Yard, with its extensive frontage on the Sea, is one of the best in the country, and the Berths have been arranged to accommodate vessels of the largest size and weight. New Shops have recently been completed or are under construction on the South side of the Yard.

The equipment of the Yard is excellent, and comprises a high proportion of modern self-contained-drive machines, though the Foundry, which only handles iron and non-ferrous castings, is poorly fitted in comparison with the other Shops.

Electric Power is supplied from the Grid at 30,000 volts. The stand-by plant is of 350 kw. power, and alone could maintain only half the plant in operation.

There are ten Building Slips, four 650 ft., four 328 ft. and two 197 ft. long. The four larger berths are served by seven stationary Electric Swing Cranes.

The Yard is equipped with a "Froude" Experimental Tank and with the most up-to-date Pneumatic Tool Plant; the area of the foreshore, moreover, permits of the erection of another four Slipways, which would accommodate vessels up to 492 ft. long.

The motive power absorbed is about 1,200 h.p., and employment can be provided for about 3,000 men.

A new steam testing water-tube boiler has recently been installed with a pressure of thirty atmospheres.

The means at the disposal of the Machine Shops make it possible not only to cope with all work in connection with vessels on the Stocks, but in addition to undertake large constructional work such as bridges, hangars, sheds, trussed work like bridge spans, electric cable posts and crane frames, also metal tanks, etc.

Engine Shops and Bronze and Cast Iron Foundries

Erected in 1905 these are adjacent to the Shipyard, occupying an area of about 226,050 square ft., of which 91,496 are covered by Shops. They use about 500 M.H.P. and can give work to about 800 men.

They embrace large and well-equipped departments for dealing economically and rapidly with the great variety of machine work to be encountered in the construction of reciprocating and turbine engines and marine and land boilers of every type.

The engine works, moreover, have been specialised for the construction of ships' auxiliaries, machinery for chemical works, and sugar refineries, etc.

The cast-iron and bronze Foundries, close by the Engine Works and the Shipyard, have been installed to supply the castings required by said Works. There are two Cupola Furnaces of approximately two and one tons capacity.

The various Departments of the Yard are:—
Heavy Engine Shops.

have recently been completed or are under construction on the South side of the Yard.

The equipment of the Yard is excellent, and comprises a high proportion of modern self-contained-drive machines, though the Foundry, which only handles iron and non-ferrous castings, is poorly fitted in comparison with the other Shops.

Electric Power is supplied from the Grid at 30,000 volts. The stand-by plant is of 350 kw. power, and alone could maintain only half the plant in operation.

There are ten Building Slips, four 650 ft., four 328 ft. and two 197 ft. long. The four larger berths are served by seven stationary Electric Swing Cranes.

The Yard is equipped with a "Froude" Experimental Tank and with the most up-to-date Pneumatic Tool Plant; the area of the foreshore, moreover, permits of the erection of another four Slipways, which would accommodate vessels up to 492 ft. long.

The motive power absorbed is about 1,200 h.p., and employment can be provided for about 3,000 men.

A new steam testing water-tube boiler has recently been installed with a pressure of thirty atmospheres.

The means at the disposal of the Machine Shops make it possible not only to cope with all work in connection with vessels on the Stocks, but in addition to undertake large constructional work such as bridges, hangars, sheds, trussed work like bridge spans, electric cable posts and crane frames, also metal tanks, etc.

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The cast-iron and bronze Foundries, close by the Engine Works and the Shipyard, have been installed to supply the castings required by said Works. There are two Cupola Furnaces of approximately two and one tons capacity.

The various Departments of the Yard are:—

- Heavy Engine Shops.
- Medium and Light Machinery Shops.
- Turbine Machinery Shops.
- Engine Fitting and Assembling Shops.
- Boiler Works.
- Coppersmiths' Shops.
- Cast-iron and Bronze Foundries.
- Forge and Smiths' Shops.

FABRICA ITALIANA TUBI

At the Southern end of the Town of SESTRI PONENTE is a modern-looking Factory bearing the name "FABRICA ITALIANA TUBI" and shown in the Trade Directory as being engaged in the manufacture of "tubes in general." It lies on the North side of the Main SPEZIA-SESTRI Road at a point half a mile South of where this road crosses a medium-sized stream.

ROSE, PORTO 281

ROSE, PORTO

(See Admiralty Chart No. 1434)

(1) General Remarks

The Anchorage is well sheltered. (See Sailing Directions.)

(2) Port Facilities

Port Facilities are negligible.

There is a wooden Pier which is strong and well built, with about 18 ft. of water at the end. No Lifting Appliances have been reported.

(3) The Town

PORTO ROSE is the Residential Quarter of PIRANO.

Water Supply

The Water Supply, which is not good for drinking purposes, is obtained in Tank Lorries from the large Reservoir at PIRANO, and while several of the larger houses and hotels possess wells, a purification process would be necessary before the water would be fit for drinking.

Hospital

There is a large and well-equipped Hospital at PIRANO. There are about 12 wards containing 12 to 14 beds each.

(4) Government Establishments

Nil.

(5) Commercial Establishments

There is a Soap Factory.

The production of salt is carried out by evaporation. The Salt Lagoons are situated to the South-East of PORTO ROSE.

(6) Aircraft Factories

Nil.

(7) Air Facilities

Seaplane Station

The Seaplane Station, which is the Base of the S.I.S.A., is situated in the Bay between the Salt Storehouses and S. BERNARDINO Point.

The Station consists of one large concrete Hangar and two wooden ones, and also a well-fitted Repair Shop. The machines can be run up into these sheds on cradles.

All the machines seen were flying-boats. There were about 12 employed on the regular commercial routes, and giving local pleasure flights. Most of the machines were Monoplanes with three engines mounted on top of the plane, though there were at least two single-engined Biplane Flying-boats. All had yellow wings and black hulls.

It was estimated that the concrete sheds could each hold at least 40 large machines, and the wooden sheds 20 to 30.

There are no facilities of any sort for Land Planes in the neighbourhood. The only flat ground is the Salt Lagoons. It is presumed that the latter could be drained if necessary, and used as a Landing Ground for Aircraft.

(8) War Material Factories

Nil.

(9) Power Plants

The Towns of PORTO ROSE and PIRANO are supplied with Electric Power by a Station situated on the foreshore about midway between them.

Hospital

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(8) War Material Factories

Nil.

(9) Power Plants

The Towns of PORTO ROSE and PIRANO are supplied with Electric Power by a Station situated on the foreshore about midway between them.

The plant consists of three diesel-driven direct-current generating sets, two of which have a capacity of 90 kilowatts and one a capacity of 130 kilowatts.

A Storage Battery is installed for supplying current when the generating sets are shut down. The plant is of German manufacture, in good condition and well looked after.

Power is distributed by Overhead Cables, and used for running the tramway system in addition to the supply for general Lighting and Power.

(10) Transport Facilities

Road

The Main Road along the front is a branch of the TRIESTE-POLA Road. It is fairly wide but the surface, while poor, is suitable for vehicular traffic. The roads outside PORTO ROSE are good and of recent construction. There is a good road from PIRANO to TRIESTE.

Tramway

There is a single-track Tramway running along the coast which connects PIRANO with S. LUCIA.

282 ROSE, PORTO

Waterway

There is a Ferry Service which runs several times a day to TRIESTE.

Air

The regular Air Services maintained from PORTO ROSE are as follows:—

1. PORTO ROSE-TRIESTE-VENICE-PAVIA-GENOA.
2. PORTO ROSE-ABBZIA-FIUME.
3. PORTO ROSE-TRIESTE-BRIONI-LUSSINO-ZARA.

On each of these routes there is a regular daily service, one machine each way.

(11) Signal Communications

W/T Station

There is a W/T Station with two conspicuous lattice masts, situated on the summit of the hill above S. BERNARDINO Point. The Station is enclosed by a wall. The Station is possibly a military one and appears from the outside to be in a rather dilapidated condition.

There are no V/S Stations, and no Submarine Cables were observed.

The Telegraph Office is in the Post Office.

PORTO ROSE is connected to the general Telephone System. The Telephone Exchange is by the Pier.

(12) Defences

Nil.

(13) Reconnaissance

FISINE and SIZZIOLE Bays

Landing from boats could be carried out quickly and with little danger from hostile fire.

On the North-West side of FISINE Bay there is a concrete mole about 250 ft. long, and wide enough at its narrowest end to land and form up platoons from boats at both sides together. The depth of water is from 10 to 20 ft.

In the South-East corner of FISINE Bay there is a good landing on a concrete Wharf situated on the North side of SEZZA Tower. There is ample room for a company to form up, and the main road is only 60 yards away. The main road here might form a good position for hostile machine-gun defence.

At the head of SIZZIOLE Bay landing could be carried out from ship's boats at the Salines. There are about six canals running through the Salines. The average depth is 8 ft. in the smaller canals and 12 to 14 ft. in the DRAGOGNA River and S. ODORICO Canal.

The landing places mentioned and the roads, until clear of S. LUCIA, would probably be subject to fire from local infantry posts only.

Plenty of good water can be obtained from the springs and wells, of which there are large numbers. Fuel in the form of wood, peat, etc., is plentiful.

There are several camp sites available. There are two football grounds at S. LUCIA and a large stretch of fairly level ground at the back of the Railway Station. There are several large open spaces suitable for camp sites within five miles of PORTO ROSE on the S. LUCIA-SIZIOLE Road.

SCIPAR Bay

Owing to the hills at the back of PIRANO and PORTO ROSE, it would be most unsuitable to land a force on the beaches on the Eastern side of the Gulf of PIRANO.

The most advantageous landing place would be on the Western arm of the gulf.

SCIPAR Bay appears an excellent place at which to effect a landing. There are two fathoms of water close inshore, and a road from the shore leading to ZAMBRATTIA Village, which is 2½ miles from the TRIESTE-PARENZO railway at CARSO.

There are no V/S Stations, and no Submarine Cables were observed.

The Telegraph Office is in the Post Office.

PORTO ROSE is connected to the general Telephone System. The Telephone Exchange is by the Pier.

(12) Defences

Nil.

(13) Reconnaissance

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There is a good foreshore for forming up, and boats could run aground on the beach.

On this front the shore gradually slopes up to the Village, and there is no dead ground on the immediate front.

Enemy defensive positions could be expected amongst the scrub on the crest of the ridge behind ZAMBRATTIA Village (151 ft.), and in the few houses constituting the Village itself.

Inter-communication along the beach could be carried out by land line.

Exits from the beach would be confined to a second-class road to the Village of ZAMBRATTIA, and thence to the railroad at CARSO.

Covering positions could be taken up on the small feature at CAST SCIPAR, to the right of the main landing.

There are excellent camping sites in the vicinity of ZAMBRATTIA.

Water Supply

Ample water is obtainable from wells in ZAMBRATTIA and the surrounding vineyards.

In summer, the salt pans close to the railroad at CARSO would afford excellent emergency landing facilities for Aircraft.

SAVONA 283

SAVONA

(See Plans 29 and 30)

(1) General Remarks

SAVONA is a Town of some 65,000 inhabitants and is the Capital of the Province of the same name. It is essentially commercial in character, the chief claim to importance being that it is the leading centre of importation of coal and raw materials for the whole of LIGURIA and PIEMONTE. The export trade for this area passes through GENOA.

SAVONA is the most important Industrial Town between GENOA and the frontier. The main industries are connected with the Steel and Iron Trade. There are several Chemical Works in the district. Subsidiary to the Steel Trade is the Shipbreaking Business which is carried out in the Port to provide scrap iron and steel. Vessels of all nationalities are being broken up continuously.

The following route to SAVONA has been reported by the Greek S.S. "Helene Kulukundis": from position 44° 07' N., 08° 37' E. (pilot picked up) course was W.S.W. to a position 3' from C. NOLI, thence direct to SAVONA. Leaving SAVONA a course of 180° was steered for 12' after which there was no restriction.

(2) Port Facilities

Ample facilities are afforded for the embarkation and disembarkation of troops.
Actual lengths and areas of Quays are as follows:—

Quay	Length (yards)	Surface (sq. yards)	Depth (feet)	Use
1	87½	2,292	26½	Coal, scrap, shipbreaking, etc.
2 and 3	242½	12,297	26½	Coal and other merchandise.
4	82	5,741	26½	Coal and other merchandise.
5 and 6	232½	13,754	26½	Timber and merchandise.
7	138½	1,912½	26½	Merchandise.
7 and 8	60	986½	26½	Shipbreaking.
8	142	1,794	26½	Merchandise and liners.
9	82	1,028½	26½	Merchandise and timber.
10 and 11	191	8,970	23	Scrap and timber.
12 and 13	221	22,365½	29½	Coal and merchandise.
14, 15 and 16	341	19,614½	29½-32½	Coal and merchandise.
Marmetta	76½	598	13½	Old ships, inflammable cargoes and mineral oils.
Breakwater Mole	323	—	32½	Coal.
Funicular Jetty	120	1,315½	29½	

Fourteen ships of 3,000 tons or more can be accommodated in the Port at once (this includes the Funicular Railway Quay). Four more ships of less than 250 ft. in length can be accommodated.

The new Railway Wagon Park is completed and there are now 9½ miles of railway track, and 300 railway trucks can be handled daily. The track is laid along all the main Quays.

Lifting Appliances are as follows:—

Number and Type	Quay	Lift	Purpose
Four Electric Hoists, Gantry and Carb.	14, 15, 16	5 tons (crane)	Coal, iron, etc.

from position 44° 07' N., 08° 37' E. (pilot picked up) course was W.S.W. to a position 3' from C. NOLI, thence direct to SAVONA. Leaving SAVONA a course of 180° was steered for 12' after which there was no restriction.

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5 and 6	232½	13,754	26½	Timber and merchandise
7	158½	1,912½	26½	Merchandise
7 and 8	60	886½	26½	Shipbreaking
8	142	1,794	26½	Merchandise and liners
9	82	1,028½	26½	Merchandise and timber
10 and 11	191	8,970	23	Scrap and timber
12 and 13	221	22,865½	29½	Coal and merchandise
14, 15 and 16	341	19,614½	29½-32½	Coal and merchandise
Marnetta	76½	598	13½	Old ships, inflammable cargoes and mineral oils.
Breakwater Mole	328	—	32½	Coal.
Funicular Jetty	120	1,315½	29½	Coal.

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Lifting Appliances are as follows:—

Number and Type	Quay	Lift	Purpose
Four Electric Hoists, Gantry and Garb. (TRIESTE TECHNICO Coy.)	14, 15, 16	5 tons (metric)	Coal, iron ore, etc.
Four Gantry Hoists, Demag type	Two on Nos. 2 and 3	4½ tons	Coal, iron ore, etc.
Six Electric Cranes (Savigliano)	Two on Nos. 12 and 13. Three on Nos. 2 and 3. Three on Nos. 12 and 13.	3 tons	Coal, iron ore, etc.
Two Hand Cranes	Nos. 4 and 11	4 tons	Cargo.
Two Steam Cranes	Nos. 4 and 10	3 tons	Scrap.
Four small Electric Cranes	Inside main warehouse...	750 Kgs.	Merchandise.
Four Electric Cranes with raising jibs	Two at No. 7. Two at No. 8.	3 tons	Merchandise.
One movable Crane	Inside main warehouse...	3 tons	Merchandise.
Four Electric Cranes, special pattern	Funicular Ropeway Jetty	5 tons	Coal.

There are in addition some eight or nine Floating Cranes or Sheerlegs, the majority with power. The capacity of these varies up to 30 tons. These are mostly used in connection with the Shipbreaking Industry.

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Harbour Craft

There are four Tugs, three small and one slightly larger (of 510 H.P.). All are fitted with fire-fighting pumps. They are owned by the NOLI Company. About 100 Lighters are available. No facilities for repairing craft out of water are available, but it is stated that a Floating Dock could operate conveniently when the projected construction of the Breakwater is carried out.

The Northern end of the Harbour is the deep end, and the mouth is 525 yards in width. The Quays projected on the North-West side have not been built, nor does it seem likely that they will at present, owing to the construction of the new motor road which runs along this side of the Harbour on trestles. The extension of P. BOSELLI Quay to the East has not materialised.

(3) **The Town**

The Town is lit by electricity, which is supplied from the High Tension Grid System which supplies the whole of the area.

Water is supplied by the S.A. Acquedotte di SAVONA from a Reservoir which is fed by springs and situated in the hills.

(4) **Government Establishments**

There is no Naval Dockyard.

There are two Barracks which are used by the local Garrison.

(5) **Commercial Establishments**

ILVA Iron and Steel Works

The SAVONA branch of this firm which possesses about 20 branches, consists of six open-hearth basic furnaces, each of 40 to 50 tons capacity. The charge consists of two-thirds scrap iron and steel and one-third pig iron.

The products of this branch are covered by the range tinplate to standard rail steel. The principal output appears to be structural material (plates and sections) rails and tinplate. Castings of small and simple shape are also made.

The limits and size of plates are reputed to be :—

Width—up to 8 ft.

Length—up to 12 metres (39 ft.).

Servettaz BASEVI

This Company manufactures heavy castings, factory machinery, railway fitting and domestic apparatus.

The apparatus used is a new and up-to-date patent French machine which pulverises coal, mixing it with oil to smelt scrap. Two and a half hours are taken to smelt 3½ tons.

Cantieri Baglietto

This establishment is situated at VARAZZE and constructs M.A.S. It is located at the Western end of the beach and is reported to be capable of building six M.A.S. hulls simultaneously.

Synthetic Nitric Acid Plant

At GIUSEPPE di CAIRO there is a Nitrogen Fixation Plant belonging to the Montecatini Società Generale: coal supplies are received from SAVONA by a 12-mile long overhead cable which handles 2,200 tons daily.

Water is supplied by the S.A. Acquedotte di SAVONA from a Reservoir which is fed by springs and situated in the hills.

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There is no Naval Dockyard.

There are two Barracks which are used by the local Garrison.

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Boat Building

"Mass" production of boats—no details—reported at VARRAZZE, on the coast, North-East of SAVONA.

Fuel Depots

The S.I.A.P. (Soc. Italo-Americano del Petrolio) is the Depot at the Docks.

The capacity of the Tanks is petrol, 8,250 tons, and benzine, 13,680 tons.

The fuel pipes are laid along the outer edge of the Quay to the Oiling Wharf for this Depot. Only 300 tons of oil fuel are said to be available in the Tanks at the Yard.

(6) **Aircraft Factories**

There is no Factory at SAVONA, but the Piaggio Company has a Works at FINALE LIGURE MARINA.

SAVONA 285

(7) Air Facilities

Owing to the mountainous nature of the country, there is no site available for even the smallest Landing Grounds in the vicinity of SAVONA. The nearest Aerodrome is at ALBENGA, 27 miles to the South-West.

Sea

The narrowness of the enclosed portion of SAVONA Harbour renders it unsuitable for the operation of Aircraft, except when the wind happens to be up and down the Harbour. There are ample Crane Facilities.

(9) Power Plants

The Main Electricity Supply is derived from the High Tension Grid System, with Power Stations in the Italian Alps. The Main Transformer Station is on the Eastern bank of the River LETIMBO at LAVAGNOLA, which is to the North of SAVONA. The Compagnia Imprese Elettriche Ligure (lessee from the Soc. El. Riviera di Ponente, Negri) has a Power Station (Diesel) on the seafloor, about a quarter of a mile to the South-West of the Dockyard. This Company used to supply the whole RIVIERA, but now appears to do little beyond supplying power for the Dockyard.

There is a special Steam Power Station to supply the Dockyard with its own power.

There is an extensive Gas Works near and to the North of the Railway Station.

(10) Transport Facilities

Rail

SAVONA is well served by the Railway, since it is at the junction of a Main Line from TURIN to GENOA and ROME, and the Coastal Line from GENOA, etc., to the frontier. The System is entirely electrified except for a few sections.

A new line is being constructed from SAVONA. This runs parallel to the main TURIN Road, i.e., in the LAVENESTRA Valley, as opposed to the more Northerly valley in which the present main line runs.

The expense of the undertaking seems to indicate that the line is of some importance. It was said to be a new direct line to TURIN, but from its direction and other sources of inferences it is more probably a new line to CUNEO and FOSSANO on the frontier, connecting up with the coast line near the goods station at SAVONA.

The Funicular Railway.—This Railway carries coal by a ropeway to SAN GIUSEPPE di CAIRO, where there is a Coal Depot which is very conveniently situated as a distributing centre for the Railway. It is on the Main Line and is the junction of a branch to ALESSANDRIA.

The Ropeway is easily visible from many points inland, since it follows the line of the hilltops.

It is privately owned.

The destruction of this Overhead Railway would paralyse the industries at TURIN.

(11) Signal Communications

There is no W/T Station as far as can be ascertained. The Town is on the Telephone and Telegraph Systems, and a Telephone System connects all Forts.

A V/S Station is situated at SAN GIACOMO above the entrance to the Harbour. This is used for commercial purposes.

(12) Defences

(i) Sea Front Defences

This Company used to supply the Dockyard.
There is a special Steam Power Station to supply the Dockyard with its own power.
There is an extensive Gas Works near and to the North of the Railway Station.

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A V/S Station is situated at SAN GIACOMO above the entrance to the Harbour. This is used for commercial purposes.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

Battery No.	Description.	No. and Calibre of Guns.	Grading.		Date.
			Position	No. and Calibre	
1	Fort S. ELENA—(P.D., E.D.)	6—9.4-in. B.L.	C.4	C.4	1940 or earlier
2	Fort S. STEFANO—(P.D., E.D.)	8—6-in.	C.4	C.4	1940 or earlier
3	Fort MADONNA del MONTE—(E.D.)	4—9.4-in. 4—4.7-in.	C.3	C.3	1940 or earlier
4	Fort MADONNA degli ANGELI	4—9.4-in. 4—4.7-in.	B.2	B.3	1941

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(c) Landward Defences

Battery position "A."—This is situated in Fort SCIARRAMENTO. The Battery at one time consisted of four guns of 4.7-in. calibre, but no information has been received for some years.

Battery position "B."—This is situated on MONTE CIUTO and is in a very commanding position since it overlooks both the seaford from SAVONA Harbour to CAPE VADI and the ridge on which the CADIBONA Pass and LA BOCHETTA Fort are situated. Some armament is thought to exist. Some troops are stationed within the precincts of the position.

Battery position "C."—This is situated at Fort LA BOCHETTA which is situated at the head of the CADIBONA Pass and possesses an extensive all round view. Access to the Fort is protected by a medieval system of drawbridges which would nevertheless form an effective means of temporarily barring the Road.

The Garrison consists of about 50.

The existence of any fixed armament is unlikely.

Battery positions "D" and "E."—There is no information of any kind available.

(g) Magazines

About 850 yards to the South-East of No. 4 (MADONNA degli ANGELI Battery) there is a building which appears to be a Magazine. It is connected to No. 4 by a good road.

(iv) Local Seaward Defences

Booms and Net Defences

An Anti-Submarine Net Defence is in position.

(v) Local Air Defence

A.A. Batteries

Battery No.	Description.	No. and calibre of Guns.	Grading.	Date.
1	S. GIACOMO Barracks	4—?	C.2	1942
2	Funicular Railway, South-East of the SAVONA-GENOA Railway Bridge	2—?	C.2	1942
3	Funicular Railway, North-North-East of the SAVONA-GENOA Railway Bridge	1—?	C.2	1942

Note.—These guns may be mobile.

(viii) Garrison

The 41st Regiment of Artillery is stationed at SAVONA.

One Heavy Battery (two groups) from the 6th Regiment of Artillery is stationed at S. GIACOMO Barracks. The remainder of the Regiment is presumed to be at ALBENGA.

In addition to these troops, there are Militia units.

(13) Reconnaissance

The whole of this part of LIGURIA is very hilly, and incursions inland could only be conveniently made up the main valleys through which the roads run:—

(i) On either side of SAVONA there are beaches where troops could be landed; the best

The existence of any fixed armament is unlikely.

Battery positions "D" and "E." — There is no information of any kind available.

(g) *Magazines*

About 850 yards to the South-East of No. 4 (MADONNA degli ANGELI Battery) there is a building which appears to be a Magazine. It is connected to No. 4 by a good road.

(iv) *Local Seaward Defences*

Booms and Net Defences

An Anti-Submarine Net Defence is in position.

(v) *Local Air Defence*

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In addition to these troops, there are Militia units.

(13) *Reconnaissance*

The whole of this part of LIGURIA is very hilly, and incursions inland could only be conveniently made up the main valleys through which the roads run :—

- (i) On either side of SAVONA there are beaches where troops could be landed ; the best being the long stretch of sand between SAVONA and VADO on the South-West side. Between this and the Main Road are a number of walled-in private properties. Exits exist between the majority of them. On the far side of the Main Road are houses and walled-in gardens for the whole stretch as far as ZINOLA. Exits inland are provided by the roads and walled lanes.
- (ii) To the North-West of SAVONA for about 1½ miles, the foreshore is steep and rocky and unsuitable for landing on a large scale. At ALBISSOLA there is a considerable stretch of sandy beach. The river valley opens out considerably in this area.
- (iii) The country inland is extensively cultivated where it is not too steep. The hillsides are mostly terraced to allow of fruit growing.
- (iv) There are no sites in this district really suitable for a large camp although small sites exist.
- (v) Water and fuel are moderately plentiful.
- (vi) There are no Emergency Landing Grounds for Aircraft.

SESTRI LEVANTE
SPEZIA 287

SESTRI LEVANTE

(Lat. 44° 16' N., Long. 9° 23' E.)
(See Admiralty Chart No. 157)

(2) Port Facilities

Lifting Appliances

There are six Cranes.

(3) The Town

The Town has a population of 14,400 and is situated partly on the Peninsula of PUNTA di SESTRI and partly on a small plain at the mouth of the TORRENTE GROMOLO which flows in the sea 4½ cables North-East of PUNTA di SESTRI.

There is a Hospital in the Town.

(5) Commercial Establishments

Shipyard of Cantieri Navale Del Tirreno

The equipment of the Yard is excellent and comprises a high proportion of modern self-contained-drive machines, though the Foundry which only handles iron and non-ferrous castings is poorly fitted in comparison with the other Shops.

The Foundry is a large building East of the ROME-GENOA Railway and in line with the Fishing Harbour.

Small turbines are constructed of the BELLUZZI type and are used in merchant ships; the largest constructed is for 6,000 h.p.

(9) Power Plants

Electric Power is supplied from the Grid at 30,000 volts, the stand-by plant is of 350 kw. power and alone could maintain only half the plant in operation.

SPEZIA

(Lat. 44° 06' N., Long. 9° 50' E.)

(See Plans 31. 33 and 34, and Admiralty Chart No. 155)

(1) General Remarks

SPEZIA, which lies at the North-Western end of the Gulf of SPEZIA, is in normal times the most important Naval Base in Italy. It is well equipped to carry out repairs.

It is used as a Submarine Base; probably some ten boats are normally refitting there. In addition there are some eight Italian Submarines for local patrols.

Anchorage

SPEZIA is a "B" Anchorage.

There is anchorage in the following areas:—

- (i) Inside and immediately outside the Commercial Port.
- (ii) SENO del FEZZANO.
- (iii) SENO delle GRAZIE.
- (iv) Baia di PORTOVENERE.
- (v) SENO di LERICI.
- (vi) SENO di PERTUSOLA and SENO di MUGGIANO.

For details see Mediterranean Pilot, Volume II.

(5) **Commercial Establishments**

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For details see Mediterranean Pilot, Volume II.

Conspicuous Objects

- (i) Signal Station on ISOLA PALMARIA.
- (ii) Light Tower on ISOLOTTO del TINO.
- (iii) Monte SAGRO, 5,738 ft.
- (iv) Monte ALTISSIMO, 5,213 ft.
- (v) Monte PANIA della CROCE, 6,100 ft.
- (vi) Two chimneys on Monte CASTAGNEDRO.

Currents

The current sets Southward along the Western side of the Gulf, and Northward along the Eastern side, but it is influenced by the prevailing wind.

Weather

Southerly winds prevail in summer, Northerly and North-Easterly in winter, but they are seldom dangerous. South-East winds are sometimes dangerous in winter, accompanied by rain. During Westerly winds heavy squalls form the mountains occur.

288 SPEZIA

(2) Port Facilities

Description of Harbour

The Gulf of SPEZIA is bounded on the South by a line joining ISOLOTTO del TINO and Punta CORVO: the outer part of the Gulf lies between that line and a breakwater which extends from a position about 2 cables off Punta Santa MARIA to a point about $1\frac{1}{2}$ cable off Punta Santa THERESA. The inner part of the Gulf lies to the North-Westward of that breakwater.

Entrances

- (i) The Western entrance lies between Punta Santa MARIA and the breakwater, is 2 cables wide and has depths of 7 fathoms (chart).
- (ii) The Eastern entrance lies between Punta Santa THERESA and the breakwater, is 1 cable wide, and has depths of $5\frac{1}{2}$ fathoms. (Chart.)

Harbours

- (i) Darsena DUCA degli ABRUZZI, length from North to South 8 cables, maximum width from East to West $5\frac{1}{2}$ cables is contained by three moles.

The Southern Mole extends Eastward close Northward of Cala CADIMARE for 1,600 ft. and then turns North-Eastward for 600 ft.

Molo LAGORA extends 1,870 ft. South-Eastward from close North-Eastward of the building slips.

Diga EST, with a total length of 2,550 ft., lies between the above two moles. The main entrance, which lies between the head of the Southern Mole and the Southern extremity of Diga EST, is 450 ft. wide.

The North-Eastern entrance, between the head of Molo LAGORA and the Northern extremity of Diga EST is about 200 ft. wide.

MAROLA Jetty projects Eastwards for 800 ft. from the Coal Wharf on the West side of the Darsena.

In the Darsena there are general depths of 38 ft.

(ii) ROYAL ARSENAL

The ROYAL ARSENAL is situated at the North-West end of the Darsena Duca Degli ABRUZZI; there are two basins.

- (a) No. 1 Basin is 1,500 ft. long and 650 ft. wide. The entrance is 150 ft. wide.
- (b) No. 2 Basin, which is entered through No. 1 Basin, is 2,000 ft. long, 650 ft. wide, and reversed L shaped. The entrance is 150 ft. wide.

- (iii) Porto MERCANTILE lies to the North-Eastward of Darsena Duca degli ABRUZZI: it is bounded on the Eastern side by Molo Duca degli ABRUZZI which extends 1,600 ft. Southward from the shore.

At the end of this Mole is a narrow jetty which runs Southward for 250 ft., then South-Westwards for 750 ft. On the South-Western and Southern sides the Harbour is bounded by Molo ITALIA which extends 900 ft. South-Eastward from the shore and then turns Eastward for 575 ft. The entrance is 1,050 ft. wide.

- (iv) Porticciolo delle TORPEDINIERE is situated between Darsena Duca degli ABRUZZI and Porto MERCANTILE. It is 2,230 ft. long, 500 ft. wide at its South-Western end for 470 ft. and thereafter 800 ft. wide. It is bounded on its South-Eastern side by Molo MIRABELLO which is 800 ft. long, at its North-Eastern end by the shoreward section of Molo ITALIA, and on the North-Western side by the shore. The entrance is 1,470 ft. wide.

MIRABELLO is a small rectangular pier 500 by 250 ft., situated at

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(v) Porticciolo MILITAIRE is a small rectangular camber, 500 by 250 ft., situated at the roots of Molo LAGORA and Molo MIRABELLO; reserved for men-of-war's boats. It is connected, at its North-West corner, with Canale CIRCONVALLAZIONE, which borders the Naval Arsenal on three sides.

All the above harbours are quayed.

Minor Harbours alongside and Berths in the Gulf of SPEZIA.

In the inner part of the Gulf the North-East shore is extensively quayed and there are many piers; there are also a number of small harbours in which there are quays.

These include:—

(a) Seno delle GRAZIE: quayed on the Northern side of Punta del VARIGNANO Promontory; used for Naval purposes.

(b) Seno del FEZZANO: quayed and used by Merchant Vessels.

(c) CADIMARE Cove: quayed; small shipyard.

(d) Punta Santa THERESA: short mole; quayed; used by small vessels.

Mooring Buoys

There are Mooring Buoys North-West of Punta CALANDRELLO; off the San BARTOLOMEO Shipyard; a large number in the Northern part of the Gulf, which are reserved for ships of the Royal Italian Navy; North-West of Molo Duca degli ABRUZZI—these are reserved for vessels adjusting compasses; in Darsena Duca degli ABRUZZI; and in the Porto MERCANTILE.

Accommodation

There is accommodation for a Large Fleet.

Lifting Appliances

- 1 crane between Docks 1 and 2.
- 1 crane between Docks 3 and 4.
- 1 crane at Dock 5.
- 1 crane at Dock 6.
- 2 cranes on East Quay, BASIN 1.
- 2 cranes on West Quay, BASIN 2.
- 9 cranes on MAROLA Jetty.
- 1 crane on building in West corner of BASIN 1.
- 2 cranes on quayside of Porto MERCANTILE.
- 6 electric travelling gantries on Molo Duca degli ABRUZZI.
- 1 crane on ODERO TERNI Mole.
- 10 cranes working in ODERO TERNI Shipyard.
- 2 sheerlegs.
- 1 double floating crane—capacity 100 tons.

Trade

The principle industries are Shipbuilding, Docking and Repairs, Engineering, the manufacture of gun mountings and guns of all calibres, telegraph cables, cement, patent fuel, lead piping, and oil refining.

Estimated Daily Capacity

1,500/2,000 d.w. tons stores.

Harbour Craft

Four Commercial Tugs—100 to 450 h.p. Some Naval Tugs—up to 800 h.p.

Facilities for Clearing the Port Area

The Docks Area, including MAROLA Jetty, the Coaling Wharf, San VITO Basin, The Royal Arsenal, Porticciolo delle TORPEDINIERE, Porto MERCANTILE and Molo Duca degli ABRUZZI; and the Industrial Area on the North-Eastern side of the Gulf of SPEZIA are served by railway tracks which connect up with the Main Coastal Railway. There is also adequate road communication between the same areas and the Main Coastal Road.

Water

Water is laid on to the quays and can be supplied by water-boats.

Coal

There are ample supplies of coal for bunkers at Quays and for delivery into lighters. The Eastern Mole of the COMMERCIAL PORT is used exclusively for the dumping of coal, and any overflow is dumped on the quayside. The coalsheeds on the MAROLA side of the Harbour have no outward signs of their identity.

1 crane at Dock 6.
2 cranes on East Quay, BASIN 1.
2 cranes on West Quay, BASIN 2.
9 cranes on MAROLA Jetty.
1 crane on building in West corner of BASIN 1.
2 cranes on quayside of Porto MERCANTILE.
6 electric travelling gantries on Molo Duca degli ABRUZZI.
1 crane on ODERO TERNI Mole.
10 cranes working in ODERO TERNI Shipyard.
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(3) The Town

The City of SPEZIA is situated Northward of the Royal Arsenal and has a population of about 123,000.

Water Supply

The main supply is held in three enclosed reservoirs at the mouth of the valley on the North-East side of the Impet Oil Refinery. Subsidiary supplies are held in a reservoir 170 yards South-West of the prominent hairpin bend 1,500 yards North-North-East of MIGHARMA on the MIGHARMA-BOTTAGNA road.

Another probable supply is enclosed in two circular tanks at the South end of the East wall of the Town.

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x

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(4) Government Establishments

Naval Dockyard

There are six Graving Docks and a Floating Dock, measurements as follows :

	Extreme Length.	Length inside Caisson to Coping Head.	Coping Width.	Width at Entrance.	Remarks.
Graving Dock 1	354'	341'	70' 8"	?	10-ton electric cranes serve G.D.s 1-4. No. 5 can take Battleship of "Cavour" Class.
Graving Dock 2	428'	410'	76' 5"	?	
Graving Dock 3	428'	410'	76' 5"	?	
Graving Dock 4	354'	410'	71' 6"	?	
Graving Dock 5	702'	687'	105' 6"	105'	
Graving Dock 6	702'	687'	100' (approx.)	90'	

Floating Dock for Submarines : Length, 226' 4"; Width, 36'; Lift, 500 tons.

There is a Torpedo Workshop in the South-East corner of the Dockyard, near No. 1 Basin, with small machines suitable for repairs to hulls and machinery of T.B.D.s.

Gun construction is not carried out, but the relining of medium and small calibre guns and general repair work to gun mechanisms is undertaken.

The North-Eastern half of the building marked Electricity Workshops in the dockyards is used as a foundry, as also the buildings immediately to the South-East which are unmarked on the plan, and buildings marked FOUNDRY are probably used as a workshop or storehouse.

Submarine Base

This is situated on the West side of No. 1 Basin. The buildings, some of which are two-storied, include Officers' Messes, Barracks for Petty Officers and lower ratings, lecture rooms and recreational facilities.

M.A.S. Base

The M.A.S. Base is sited immediately to the South-East of the Customs House at the Dockyard end of VIALE UMBERTO in the Porto VECCHIO.

Dockyard Laboratory

This is situated immediately inside the Main Gates. The equipment, which has not yet been completed, includes a mechanical testing room, chemical laboratory, microscopic and spectroscopic testing rooms, a corrosion testing room and drawing offices.

Naval Oil Storage

The Naval Oil Storage, total estimated capacity 69,000 tons of fuel oil, is contained in two groups of oil tanks on the West side of SPEZIA HARBOUR. None of the tanks is protected by blast walls, nor completely surrounded by fire walls.

Details are as follows :—

- (a) On the quay, on the West side of BASIN No. 2, 200 yards south of UMBERTO Dock No. 5. Three dazzle-painted oil tanks, total estimated capacity 27,000 tons of fuel oil.
- (b) 500 yards S.E. of the SAN VITO BASIN. Four large and four small oil tanks. Total estimated capacity 42,000 tons of fuel oil.

San Bartolomeo Torpedo Factory

Situated on the East side of the Gulf and connected by rail with the Dockyard. Originally it was a shipbuilding and repair establishment, and two Patent Ships are still in existence and are sometimes used for hauling up small torpedo craft for repairs. The Torpedo Store is well equipped and can accommodate over 600 torpedoes. There is a torpedo adjusting range.

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Other establishments include:—

The Head Offices of the Organisation, the functions of which resemble those of the Drafting Offices in a Home Port Depot, combined with a central examination centre for advancement; they are situated in the PIAZZA D'ARMI, as are the Naval and Military Hospitals and the Infirmary. In the same area are the premises of the "Dopolavoro" Institute for the workmen of the Dockyard.

The Specialist Training School of "SAN BARTOLOMEO," where large numbers of long service technical entries receive their initial training, and where requalifying courses are held. This establishment is situated between the SAN BARTOLOMEO Torpedo Factory and the MUGGIANO Air Station.

Naval Club

The Officers' Club is situated on the Dockyard side of the Customs House referred to above and includes tennis courts and yachting facilities.

SPEZIA 291**Naval Museum**

There is a Naval Museum situated just inside the Main Dockyard Gates adjoining the Dockyard Laboratory.

Barracks

There are Barracks at VARIGNANO and, adjoining them, a Wireless School.

The Naval Barracks are on Strada di CIRCONVALLAZIONE LEVANTE, facing the PIAZZA D'ARMI. Infantry Barracks are at the West end of the same Strada, and Artillery Barracks are on PIAZZA D'ARMI facing Eastwards.

I.N.P.E.T. Oil Refinery

This refinery is at MIGLIARINA and covers a large area the centre of which is 900 yards 055° from SPEZIA Railway Station in Lat. 44° 07' N., Long. 9° 50' E. The output of various petroleum products amounts to about 250,000 tons per annum.

Oil Storage

The total estimated capacity of the oil storage is 85,000 tons of crude oil.

This includes three large oil tanks; diameter approximately 116 ft., estimated capacity of each tank 10,000 tons of crude oil. No blast walls have been constructed, and less than 25 per cent. of the tanks are surrounded by low fire walls. The oil tanks are dazzle-painted.

Other stocks are in the following positions:—

A group of three tanks on the North side of the railway at base of the Eastern Mole of the COMMERCIAL PORT.

Three large tanks camouflaged and screened by trees on West quay, 200 yards South-East of Dock 5.

Four medium and four small tanks recessed into cliff at MAROLA.

Two small tanks behind the coal sheds at CADIMARE Harbour.

A suspected fuel storage is cut in hillside on the West side of the SAN VITO basin.

(5) Commercial Establishments**New Industrial Area**

Between AVENZA and APUANIA, 12 to 15 miles South-Eastward from SPEZIA, on either side of the railway, and between the railway and the main road, there is a vast new industrial area, partly completed but mostly under construction. There are or are to be in this area 59 new factories.

South-East of AVENZA station, at a distance of 400 to 500 yards, a large munition and Shell Factory is completed; other new factories are PIRELLI'S, an Iron Foundry, Glass, Chemical, Hemp and Chain Works and many others.

Odero Terni (formerly Ansaldo San Giorgio) Shipyard

Situated at MUGGIANO. Specialises in the construction of Submarines. The number of Building Slips is uncertain, but such details as are known are given in Section V (2). The Yard is fully equipped with modern machinery driven by electricity from a Central Electric Power Station. A mole 262 ft. in length forms a Fitting-Out Basin near the Building Slips, the head of the mole extending to the 5 fathoms line. The mole is provided with compressed air leads for work on board, electric terminals for charging the batteries of Submarines, and an Oil Fuel Pipe-line.

A number of Midget submarines, possibly as many as 24, are reported to be building in this Yard.

The Eastern portion of the Yard is principally used for the construction of merchant vessels. About 5,000 men are employed in the Yard.

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(5) Commercial Establishments

New Industrial Area

Between AVENZA and APUANIA, 12 to 15 miles South-Eastward from SPEZIA, on either side of the railway, and between the railway and the main road, there is a vast new industrial area, partly completed but mostly under construction. There are or are to be in this area 59 new factories.

South-East of AVENZA station, at a distance of 400 to 500 yards, a large munition and Shell Factory is completed; other new factories are PIRELLI'S, an Iron Foundry, Glass, Chemical, Hemp and Chain Works and many others.

Odoro Terni (formerly Ansaldo San Giorgio) Shipyard

Situated at MUGGLIANO. Specialises in the construction of Submarines. The number of Building Slips is uncertain, but such details as are known are given in Section V (2). The Yard is fully equipped with modern machinery driven by electricity from a Central Electric Power Station. A mole 262 ft. in length forms a Fitting-Out Basin near the Building Slips, the head of the mole extending to the 5 fathoms line. The mole is provided with compressed air leads for work on board, electric terminals for charging the batteries of Submarines, and an Oil Fuel Pipe-line.

A number of Midget submarines, possibly as many as 24, are reported to be building in this Yard.

The Eastern portion of the Yard is principally used for the construction of merchant vessels. About 5,000 men are employed in the Yard.

Auxiliary Machinery

The Works of TERMOMECCANICA ITALIANA S.A., are situated in the Western angle formed by STRADA DEL MOLO and the VIALE SAN BARTOLOMEO. This important factory manufactures, among other items, marine auxiliary machinery.

CerPELLi Engineering Works

This firm is associated with Messrs. Ansaldo, of GENOA, and is engaged in the production of centrifugal and turbine pumps.

Catapult Factory

A small Factory for the manufacture of catapults exists about 400 yards South of the PIRELLI Cable Factory, on the East side of the road.

(6) Aircraft Factories

Believed none.

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(7) Air Facilities

Seaplane Stations

MUGGLIANO.—Lat. 44° 05' 30" N., Long. 9° 52' 00" E., just to the Eastward of S. BARTOLONEO Pt. Six Hangars and three Slips.

CADIMARE.—Lat. 44° 04' 57" N., Long. 9° 49' 21" E., in CADIMARE Cove. Four large Hangars and one broad Slipway; a Quay and a Crane.

Aerodrome

SARZANA Aerodrome is sited on the North-Eastern banks of the River MAGRA, about 3 miles from its outlet in the Gulf of GENOA and about 2 miles South-East of Town of SARZANA which is South-East of SPEZIA. Dimensions are: North-East to South-West, 1,200 yards; North-West to South-East, 400 yards. Two Hangars and an underground Petrol Store with four refuelling points in the North-Eastern corner. Repair shops and other buildings.

(8) War Material Factories

"Stabilimenti Meccanici" (Ansaldo's Ordnance Works—controlled by Odero-Terni-Orlando). Situated near the Village of MUGGLIANO, and are well equipped with modern machinery for the manufacture of guns of large and small calibre. The principal shop for heavy gun construction is one of the largest in EUROPE, and is served by a 100-ton crane, travelling at a height of 100 ft. There is a pit 60 ft. deep, so that it is possible to construct 16-in. guns of 50 calibres. The Gun-Mounting Shop contains four pits, 40 ft. in diameter and 60 ft. deep, for the erection and testing of heavy gun mountings, and is also served by a 100-ton crane. The gun forgings, armour and cast steel required, are supplied from the TERNI Steel Works. The works are also equipped with plant for the manufacture of field and siege artillery.

Explosives Factory and Depot

A number of shops—presumably for filling—and store houses exist in the area on the East side of the road about a quarter of a mile North of the PIRELLI Cable Factory. Considerable barrack accommodation has recently been added in the same area.

San Vito Arsenal.

Situated to South of the Dockyard. Contains a Foundry, Smithy, Gunshop, Machine and Fitting Shop.

Pyrotechnics

There is a large plant for the production of explosives on the East side of the Town. The filling depot is marked Guncotton Depot on Plan 31 and the finished ammunition is stored in numerous small groups protected by anti-blast walls to the South and East. This Depot also possesses a testing range approximately 620 yards long.

COLOMBINO: Factory under Construction

There is a large factory under construction at COLOMBINO immediately East of an Ammunition Dump. Some buildings have been erected and a large area to the North-West of them has been cleared and drained and work on this area is in progress. The entire establishment is surrounded by a ditch which drains into a canal connected with the sea.

From these works are the foundations of a road to connect the factory with the Docks.

Immediately East of the factory are some 45 constructions in the shape of triangular mounds with an angle of 130°. The sides of the triangles are about 25 ft. in length. The foundations of a further 27 of these constructions are visible from the air at the West corner of the factory buildings. Their purpose is not known.

Powder Factory

At APUANIA, about 6 miles South-East of SPEZIA, is the Montecatini Powder Factory.

(9) Power Plants

Electricity

Small Traction Station 950 yards North-East of building marked Power

for the manufacture of guns of large and small calibre. The principal shop for heavy gun construction is one of the largest in EUROPE, and is served by a 100-ton crane, travelling at a height of 100 ft. There is a pit 60 ft. deep, so that it is possible to construct 16-in. guns of 50 calibres. The Gun-Mounting Shop contains four pits, 40 ft. in diameter and 60 ft. deep, for the erection and testing of heavy gun mountings, and is also served by a 100-ton crane. The gun forgings, armour and cast steel required, are supplied from the TERNI Steel Works. The works are also equipped with plant for the manufacture of field and siege artillery.

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Powder Factory

At APUANIA, about 6 miles South-East of SPEZIA, is the Montecatini Powder Factory.

(9) Power Plants

Electricity

There is a small Transformer Station 250 yards North-East of building marked Power Station on Plan 32. This is close to the railway and probably supplies it with current.

As the Transformer appears to be the only electrical plant in SPEZIA it is thought that the Town's power is supplied by a hydro-electric power station in the interior.

Gas

A small Gas Works, position as Plan 33, has two wet type gasometers and is the Town's only supply.

(10) Transport Facilities

Railways

SPEZIA is on the line from PISA to GENOA, and thence to the French Frontier at VENTIMIGLIA. The section from the Station Eastwards towards PISA is electrified; power being supplied by overhead wires. Northwards of SPEZIA the line follows the coast

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and has numerous tunnels. The cost of upkeep is heavy, in view of frequent landslips and necessary repairs to the numerous tunnels. The Italian authorities appear to recognise the vulnerability of this coast railway, as the question of constructing a line running inland between SPEZIA and GENOA has been considered from a military point of view; the scheme has, however, not yet been adopted on account of the heavy expenditure involved.

The Railway Depot is situated on the East side of the Inpet Oil Refinery and possesses an engine shed, a water tower and considerable coal stocks.

The goods depot is situated on the North side of the Gas Works; here there are two warehouses, but the majority of goods appear to be dumped on open ground between the lines.

At the Station there is a warehouse, two water towers and a turntable.

Throughout the whole system there is only a moderate amount of goods traffic.

SPEZIA is also connected to PARMA, the line running directly inland.

(11) Signal Communications**W/T Station**

(a) There is a High Power Naval W/T Station situated near the San Vito Arsenal, about 150 yards South of the red light at the entrance to No. 1 Basin; position, Lat. $44^{\circ}05'34''$ N., Long. $9^{\circ}49'03''$ E.

(b) Small W/T Station on PEZZINO Pt. manned by naval ratings.

(c) A W/T Station (four masts) exists in a position about half a mile due South of the Village of CAPARANA.

Telephones and Telegraph

SPEZIA has a comprehensive Telephone and Telegraph System.
There is no cable.

(12) Defences**(i) Sea Front Defences****(a) Coast Defence Batteries**

No.	Name or Position.	Armament.	Grading.		Date of Latest Report.
			Position and No.	Calibre.	
1	MADONNA di MONTENEGRO: sited 1,100 yards, 075° from church on Hill 1115, on a hill.	? 6—? 11-in. hows. or guns.	B.2	B.3	1940
2	Pta. della CASTELLANA Fort: sited 1,225 yards, 300° from the fort east of a ridge running South-East from CAMPIGLIA to Fort CASTELLANA.	4—? 11-in. hows. . .	A.2	A.3	1942
3	PALMARIA Island: North-West Point.	3—2.2-in. . .	B.2	B.3	1940
4	PALMARIA Island: Fort . . .	4—9.4-in. or 11-in. hows. or guns.	A.2	B.2	1942
5	TINO Island: Pta. BIANCA . . .	4—6-in. . .	B.2	B.3	1940
6	PALMARIA Island: Pta. della MARIELLA.	? No. and calibre (possibly 4.7-in. or 6-in.)	B.2	—	1940
7	PALMARIA Island: North-East . . .	4—3-in. . .	B.2	B.3	1940

W/T Station

- (a) There is a High Power Naval W/T Station situated near the San Vito Arsenal, about 150 yards South of the red light at the entrance to No. 1 Basin; position, Lat. 44° 05' 34" N., Long. 9° 49' 03" E.
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3	PALMARIA Island: North-West Point.	3-2-2-in. ..	B.2	B.3	1940
4	PALMARIA Island: Fort ..	4-9-4-in. or 11-in. hows. or guns.	A.2	B.2	1942
5	TINO Island: Pta. BIANCA ..	4-6-in. ..	B.2	B.3	1940
6	PALMARIA Island: Pta. della MARIELLA.	? No. and calibre (possibly 4-7-in. or 6-in.)	B.2	—	1940
7	PALMARIA Island: North-East Point.	4-3-in. ..	B.2	B.3	1940
8	PALMARIA Island: sited 700 yards West-South-West of the North-East point of the Island.	3-2-2-in. ..	B.2	B.3	1940
9	Pta. SANTA MARIA ..	6-4-7-in. or 6-in.	C.2	C.2	1941
10	Pta. del PEZZANO: sited 400 yards South-West of the point ..	? No-3-in. ..	B.2	B.2	1941
11	Pta. S. THERESA ..	? No-1-8-in. ..	A.2	A.3	1942
12	Pta. di MARALUNGA ..	? No-0-8-in. ..	A.2	B.2	1940
13	Mte ROCCHETTA ..	6-? 4-5-in. ..	A.2	B.2	1940
14	Mte. MARCELLO: sited on a hill 850 yards South-South-East of Hill 886.	2-13-5-in. ..	A.2	B.2	1940
		3-5-8-in. ..	A.2	B.2	1940
		3-2-2-in. ..	A.2	B.2	1940
		? 6-9-4-in. hows or guns.	A.2	B.2	1940
		4-6-in. or 9-4-in.	A.2	B.2	1940

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Mobile Coast Defence Guns

There are armoured trains (B.2, 1941) mounting 15-in. guns (C.O., 1940) on the Coastal Railway: they can also be used for Land Defence on the section of the line North of the Town.

(g) Magazines and Ammunition Dumps

North-West of PITELLI there is a large Ammunition Depot: centre of area 1,400 yards North-East of the Northern end of S. BARTOLOMEO Shipyard: it is 1,400 yards long from North to South with an average width of about 400 yards. It lies on either side of the road up the valley East of Mte. MONTADA and Mte. VALLESCURA and consists of two portions: one of some 120 small huts laid out in artificial hollows in groups of four, which are separated by blast walls, on both sides of the road. The other consists of 23 stacks, each in an artificial hollow separated from the next by an earth mound: these are lower down the valley on the East side of the road.

In between the two portions of the Depot are some 30 spaced-off buildings of different sizes, some surrounded by artificial banks, which are further Ammunition Stores.

Both portions of the Depot are entirely enclosed by stone walls which have small towers at intervals along them.

Monte VAL di LOCHI: here there are several magazines, visible from the air, connected together and with S. BARTOLOMEO by an 18-in. narrow gauge railway. Three of these magazines are under the Fort on Mte. Val di LOCHI.

At PAGLIARO there are magazines which are connected by a military road with the Mte. VAL di LOCHI group.

In the area North of Mte. CORCHIGNOLA and South-West of Mte. TORNOLA there is an Ammunition Depot.

At COREGNA, 1,000 yards West of MAROLA, there is a Magazine built into the side of a ravine.

A Magazine at PANIGALLIA, 900 yards West of PEZZINO Point, has galleries which extend as much as 80 yards under the hill to the West of it.

At G. di MONTIN there is a large Magazine North of Land Defence Position "E" and South-West of Position "F", visible from the air: there are 15 large widely spaced huts, surrounded by blast walls, with a wall round the whole.

A Magazine is sited on PALMARIA Island on the hill 300 yards North-West of MARIELLA Point.

Minestores

There are Minestores at VARIGNANO and SAN BARTOLOMEO.

(iii) Searchlights

Searchlight positions are as follows:—

- (a) S. PIETRO Point—one or more.
- (b) MARIELLA Point.
- (c) SCUOLA Tower.
- (d) CASTAGNA Point.
- (e) S. MARIA Point.
- (f) VARIGNANO Point—one 24-in. light.
- (g) S. BARTOLOMEO—two.
- (h) S. TERENCE Castle Point.
- (i) MARALUNGA Point.
- (j) MARALUNGA Point—1 cable to South-East of the Point.

at intervals along them.

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- (h) S. TERENCE Castle Point.
- (i) MARALUNGA Point.
- (j) MARALUNGA Point—1 cable to South-East of the Point.

(iv) Local Seaward Defences

(a) Minefields

- (i) Minefield—details not specified—in the approaches (1940).
- (ii) The areas within a radius of 1 mile of SANTA MARIA Point Light, Lat. 44° 04' N. Long. 09° 51' E., and of SANTA THERESA Point Light, Lat. 44° 05' N., Long. 09° 53' E., are dangerous due to mines (1941).

Observation and Firing Stations

There are no recent reports of the location of Observation and Firing Stations but old reports placed these at CALANDRELLO Point, Sta. THERESA Point, LERICI Point and MARALUNGA Point on the Eastern side, and at VARIGNANO Point, Fort Sta. MARIA, S. PIETRO Point and FORNACE Cove—PALMARIA Island, on the Western side.

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*(b) Torpedo Batteries**(i) Control Position*

There is a Torpedo Battery Control Position near the Beacon South of CASTAGNA Point.

(ii) Torpedo Battery Positions

- (a) SCUOLA Point—PALMARIA Island.
- (b) FORNACE Cove—PALMARIA Island.
- (c) Santa MARIA Point—six tubes.
- (d) BIANCA Point—facing West.

and two other torpedo Batteries whose positions are not known.

(c) Booms and Nets

Booms have been placed in the following positions :—

- (i) Between C. ISOLA (PALMARIA Island) and BIANCA Pt. (TINO Island). B.2, 1940 or earlier.
- (ii) Across the "Little Passage" from St. PIETRO Pt. : between the end of the Western Pier of PORTO VENERE, South-Eastward to a point 100 yards West of SENO dell TERRIZZO on PALMARIA Island. A.2, 1942.
- (iii) From Western end of the Breakwater to SANTA MARIA Pt. : two lines of netting, 216 yards apart, the inner line being semi-circular ; the outer line stretches straight across the entrance channel and is operated by a vessel moored midway between the two lines of netting. A.2, 1942.
- (iv) From Eastern end of the Breakwater to SANTA THERESA Pt. : two lines of netting 216 yards apart, similar in type to (iii). A.2, 1942.
- (v) Across the entrance to VARIGNANO Bay : Boom opens at Northern end. A.2, 1942.
- (vi) North-East Entrance to Outer Port : Single Boom, 55 yards long. A.2, 1942.
- (vii) South-East Entrance to Outer Port : Single Boom, 120 yards long. A.2, 1942.
- (viii) LAGORA Mole, to protect shipping : a single Boom running South-West from the North-East Entrance forms roughly a rectangle approximately 190 yards by 205 yards. A.2, 1942.
- (ix) The 8-in Cruiser "Bolzano", moored off the building slips, is protected by a double rectangular boom, the outer line of which measures 340 yards by 220 yards. The Cruiser was lying 103 yards inside the Eastern arm of the boom and 94 yards inside the Western arm. On the West side of the boom, between the inner and outer nets was moored a liner, "Marco Polo" type. The "Bolzano" boom continues 133 yards North of the most South-Easterly buoy, then turns East for 133 yards, ending at the LAGORA Mole, thus providing protection for shipping moored at the North-West end of the Mole. A.2, 1942.
- (x) A double rectangular boom, 283 yards by 240 yards, protects the shipping at the MAROLA Jetty. A.2, 1942.
- (xi) There is a length of Boom which protects shipping at the quays north of PIRELLI Works. A.2, 1942.

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(v) Local Air Defences

(a) Anti-Aircraft Batteries

A.A. Battery No.	Name or Position.	Armament. Guns. No. and Calibre.	Grading.	Date of Latest Report.
A.A.1	PALMARIA Island: Pta. della MARIELLA: sited on the high ground West of the point.	4—? 3-in.	B.2	1940
A.A.2	PALMARIA Island: SEMAPHORE Station.	6—3-in. or larger	B.2	1940
A.A.3	MUZZERONE	4—emplacements only	A.2	1942
A.A.4	Pta. della CASTAGNA: sited at the position marked Battery.	4—? 3-in.	B.2	1940
A.A.5	Fort Santa MARIA: sited in pits in the old fort.	?—3-in.	B.2	1940

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Local Air Defences—continued.

A.A. Battery No.	Name or Position.	Armament—Guns, No. and Calibre.	Grading.	Date of Latest Report.
A.A.6	Fort PEZZINO: sited South-West of the fort on the South-East slopes of hill overlooking La CANETTE in SENO della GRAZIE.	?—3-in. ?—1.8-in.	C.3	1941
A.A.7	Il PIANO: on the South-West slopes of the hill.	5—? 3-in.	A.2	1942
A.A.8	Il PIANO to Il PIANELLA, along the North-West slopes of the ridge.	? 10—? 3-in.	B.2	1940
A.A.9	COREGNA on the South-East slopes of the ridge.	?—3-in.	C.3	1941
A.A.10	Mte. di S. CROCE	4—? 3-in.	A.2	1942
A.A.11	Mte. VERUGOLI	?—? 3-in.	B.2	1940
A.A.12	Mte. PARODI	4—? 3-in.	B.2	1941
A.A.13	North-East of FABBIANO on the East slopes of the hill.	?—3-in.	B.2	1941
A.A.14	BASIN No. 1: sited on the roof of a building at the North-West of the basin in Lat. 44° 5' 50" N., Long. 9° 48' 55" E.	2—2-in. or less	A.4	1942
A.A.15	BASIN No. 2: sited at the North-West end of the basin in Lat. 44° 6' 10" N., Long. 9° 48' 32" E.	2—3-in. or larger	A.2	1942
A.A.16	COMMERCIAL Port: sited on the little Mole on the West side of the harbour in Lat. 44° 6' 14" N., Long. 9° 49' 57" E.	2—3-in. or larger	A.2	1942
A.A.17	LAND DEFENCE Battery A: sited on a hill immediately East of the battery in Lat. 44° 6' 50" N., Long. 9° 49' 3" E.	2—? calibre	A.4	1942
A.A.18	CITA GROVI: sited at or near Land Defence Battery E.	4—? 3-in.	B.2	1942
A.A.19	Mte. GERLEGO	5—? calibre	B.2	1941
A.A.20	MIGLIARINO	? No. and calibre	C.3	1941
A.A.21	PAGLIARO: sited on the South-East slopes of the hill immediately North-East of PAGLIARO, overlooking Mte. MONTADA.	?—3-in.	B.2	1940
A.A.22	ODERO TERNI Mole: at the end of the Mole.	2—3-in. or larger	A.2	1942
A.A.23	Fort Monte PIANELLONI	2—? calibre	A.2	1941
A.A.24	Mte. GROSSO	?—3-in.	B.2	1941
A.A.25	Mte. CANARBINO	4—? 3-in.	B.2	1940
A.A.26	Prd. di MARAMOZZA: sited on the hill.	?—? 3-in.	B.2	1940
A.A.27	Mte. BRANZI	?—3-in.	B.2	1941
A.A.28	Mte. CASTELLAZZO: sited on the South-West slopes.	?—3-in.	B.2	1941
A.A.29	Mte. ROCCHETTA	?—3-in.	B.2	1941
A.A.30	Mte. MARCELLO: sited on the South-West slopes.	4—? 3.5-in.	B.2	1941

(b) Anti-Aircraft Close Defence

Fire from the guns of the Bofors type has been experienced from the following positions:—

- (i) PALMARIA Island: high ground West of Pta. della MARIELLA (near A.A. Battery No. 1). (B.2, 1942.)
- (ii) PALMARIA Island: high ground South-West of Fort (C.D. Battery No. 7) on

A.A.12	Mte. PARODI	1-3 in.	..	B.2	1941
A.A.13	North-East of FABBIANO on the East slopes of the hill.	2-3 in.	..	B.2	1941
A.A.14	BASIN No. 1: sited on the roof of a building at the North-West of the basin in Lat. 44° 5' 50" N., Long. 9° 48' 55" E.	2-2 in. or less	..	A.4	1942
A.A.15	BASIN No. 2: sited at the North-West end of the basin in Lat. 44° 6' 10" N., Long. 9° 48' 32" E.	2-3 in. or larger	..	A.2	1942
A.A.16	COMMERCIAL Port: sited on the little Mole on the West side of the harbour in Lat. 44° 6' 14" N., Long. 9° 49' 57" E.	2-3 in. or larger	..	A.2	1942
A.A.17	LAND DEFENCE BATTERY A: sited on a hill immediately East of the battery in Lat. 44° 6' 50" N., Long. 9° 49' 3" E.	2-2 calibre	..	A.4	1942
A.A.18	CITA CROVI: sited at or near Land Defence Battery E.	4-2 3-in.	..	B.2	1942
A.A.19	Mte. GERLEGO	5-2 calibre	..	B.2	1941
A.A.20	MIGLIARINO	? No. and calibre	..	C.3	1941
A.A.21	PAGLIARO: sited on the South-East slopes of the hill immediately North-East of PAGLIARO, overlooking Mte. MONTADA.	?-3 in.	..	B.2	1940
A.A.22	ODERO TERNI Mole: at the end of the Mole.	2-3 in. or larger	..	A.2	1942
A.A.23	Fort Monte PIANELLONI	2-2 calibre	..	A.2	1941
A.A.24	Mte. GROSSO	?-3 in.	..	B.2	1941
A.A.25	Mte. CANARBINO	4-2 3-in.	..	B.2	1940
A.A.26	Ptd. di MARAMOZZA: sited on the hill.	?-2 3-in.	..	B.2	1940
A.A.27	Mte. BRANZI	?-3 in.	..	B.2	1941
A.A.28	Mte. CASTELLAZZO: sited on the South-West slopes.	?-3 in.	..	B.2	1941
A.A.29	Mte. ROCCHETTA	?-3 in.	..	B.2	1941
A.A.30	Mte. MARCELLO: sited on the South-West slopes.	4-2 3-5 in.	..	B.2	1941

(b) Anti-Aircraft Close Defence

Fire from the guns of the Bofors type has been experienced from the following positions:—

- (i) PALMARIA Island: high ground West of Pta. della MARIELLA (near A.A. Battery No. 1). (B.2, 1942.)
- (ii) PALMARIA Island: high ground South-West of Fort (C.D. Battery No. 7) on North-East point of the Island. (B.2, 1942.)
- (iii) Four positions equally spaced in a line running South-West from Pta. S. MARIA, (B.2, 1942.)
- (iv) Pta. PEZZINO. (B.2, 1942.)
- (v) Fort PEZZINO. (B.2, 1942.)
- (vi) Southern slopes of the high ground North-East of CHAPPARA Cove. (B.2, 1942.)
- (vii) Mte. FALCONARA Battery. (B.2, 1942.)

(c) Mobile Anti-Aircraft Defences

There are armoured trains, each mounting up to six 3-in. A.A. guns on the Coastal Railway: they can also be used on the section of the line North of the Town.

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(vi) Land Defences

L.D. Battery.	Name or Position.	Armament.	Grading.	Date of Latest Report
A	THE ENCEINTE	Unoccupied	A.2	1942
B	FORT PARODI	6-5.8-in.	B.2	1941
C	MACE Battery	6-4.7-in.	Position B.2	1940 or earlier.
D	MARINASCO Battery	?	No. & calibre C.0	1940 or earlier.
E	FORT CASTELLAZZO	4-4.7-in. or 5.8-in.	Position B.2	1942
F	FORT ALBANO	8-4.7-in.	Position B.2	1941
G	FORT MADONNA di BUONVIAGGIO	10-5.8-in. 6-? calibre (small).	No. & calibre C.0	1940 or earlier.
H	FORT BASTIA	6-4.7-in. or 5.8-in.	Position B.2	1940 or earlier.
J	PRESONARA Battery	Unoccupied	No. & calibre C.0	1942
K	VAL-di-LOCHI Battery	Unoccupied	A.2	1942
L	FORT CANARBINO	4-9.4-in.	Position and No. A.2	1942
		4-4.7 in. or 5.8-in.	Calibre No. B.2	1940 or earlier.

TARANTO

(Lat. 40° 28' N., Long. 17° 15' E.)

(See Plans 35, 36, 37 and 38)

(1) General Remarks

TARANTO is situated in the North-West corner of the heel of ITALY, and since her entry into the war has become the chief Naval Base. It is the principal Repair Base for the Fleet. Almost the entire Harbour is devoted to Naval use and work is progressing to increase the Port Facilities. Large stocks of fuel and ammunition are available and good road and rail communications are afforded to all parts of ITALY.

Anchorages

TARANTO is an 'A' anchorage.

MAR GRANDE (Outer Harbour)

Gives spacious anchorage, with good holding ground and no swell, to vessels of any size, including Capital Ships.

MAR PICCOLO (Inner Harbour)

A lake which gives anchorage to vessels of Destroyer and Light Cruiser size. Shoals of varying widths border all its shores, and between PUNTA PENNA and the Southern shore reduce the navigable width to 200 yards.

Conspicuous Objects

	FORT MADONNA di BUONVIAGGIO	6-4-7-in. or 5-8-in.	Position B 2 No. & calibre	1940 or earlier.
G				
H	Fort BASTIA	6-4-7-in. or 5-8-in.	C 0	1942
I	PRESONARA Battery	Unoccupied	A 2	1942
J	VAL-di-LOCHI Battery	Unoccupied	A 2	1942
K	Fort CANARBINO	4-9-4-in.	Position and No.	1942
L		4-4-7 in. or 5-8-in.	A 2 Calibre No. B 2	1940 or earlier.

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Conspicuous Objects

Westward of the Port

TORRE RONDINELLA, a quadrangular Tower on PUNTA RONDINELLA
TORRE MONTELO, slender and quadrangular, with three rows of windows, on a hill about 1 mile North-East of PUNTA RONDINELLA.

South-Westward of the Port

ISOLA SAN PIETRO, low and rocky, the larger of the two Islands on West side of MAR GRANDE; ISOLA SAN PAOLO, the smaller of the two Islands, South-East of I. SAN PIETRO.

Southward of the Port

The light Tower on Cape SAN VITO.

South-Eastward of the Port

The castles of ROCCA FORZATA and LEPORANO: the latter has a quadrangular Tower with a column on it.

298 **TARANTO***Tides and Currents*

Springs rise to 0.8 ft. There is a strong tidal stream in the entrance to the Inner Harbour; frequent transverse currents which occur must be taken into account by large ships.

A slow, South-moving current sets along the Western side of the GULF of TARANTO. It is influenced in direction by Southerly winds, and when they are strong and of some duration, especially from the South-East, the current may set Northward. Southerly winds also affect the current on the Eastern shore of the Gulf, and may set it in a North-Westerly direction.

Weather

The GULF of TARANTO experiences a hot and dry summer with little cloud and rain from mid-May to mid-September, and a cool season from December to March corresponding to April or May in Southern England. Rain is at no time of the year prolific but is most plentiful in autumn and early winter, i.e., October to January. Strong winds and gales are infrequent even in winter, and quiet days with light winds and clear or partly cloudy skies are a common feature at all times of the year.

Winds

Winds are mostly North-Westerly with a bias towards East from October to December and again in April, towards North during January, February and March, and towards West during the remaining months. The strongest winds are experienced during winter but seldom produce much of a sea because they are usually more or less off-shore, i.e., North-Westerly. They are likely to blow strongest during the night and early part of the day at this time of year.

South-Westerly winds cause a loup which affects the working of cargo in the Commercial Port, while South-Easterly winds raise the level of the water there.

Visibility

Visibility is seldom other than good, the few occasions of poor visibility usually being in the early morning and evening and confined to low-lying land and the immediate vicinity of the coast. There are on the average about two such days each month from November to April.

Cloud and Rain

Days with overcast skies amount to about ten a month from November to April, and very few in summer. Skies that are nearly cloudless are common in summer, and even in winter occur probably on about eight days a month. Rain falls mostly in the form of heavy showers on about six days a month from November to January, four days in October and February to April, two or three days in September and May and rarely in the remaining months.

Temperatures

Temperatures range usually between 60° and 40°F. in winter and between 90° and 65°F. in summer. The summer heat is seldom damp, but a moist scirocco or Southerly wind occurs occasionally between October and April and is particularly unpleasant if during either of these two months. It is noteworthy that September is a hotter month than June, and the heat of summer lingers into autumn.

(2) Port Facilities*Description of the Harbour*

The Port of TARANTO consists of:—

- (i) MAR GRANDE, or Outer Harbour, which opens out into the Gulf of TARANTO. It is completely sheltered from all but South-South-Easterly winds and though the entrance is restricted by breakwaters it affords 4 square miles of anchorage.

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(i) MAR GRANDE, or Outer Harbour, which opens out into the Gulf of TARANTO. It is completely sheltered from all but South-South-Easterly winds and though the entrance is restricted by breakwaters it affords 4 square miles of harbour suitable for capital ships.

It is enclosed on the Northern and Eastern sides by the Mainland. The Northern to South-Western sides are bounded by submerged Breakwaters and Islands as follows :—

(a) A submerged Breakwater joins RONDINELLA Point on the Mainland to PUNTA LO SCANNO, the Northernmost point of ISOLA di SAN PIETRO. 650 yards depth of 11 ft.

(b) ISOLA di SAN PIETRO extends Southward from PUNTA LO SCANNO for 1,350 yards.

(c) A submerged Breakwater joins ISOLA di SAN PIETRO to ISOLA SAN PAOLO, from a point approximately 300 yards South-West of Il POSTO Point, the Eastern extremity of ISOLA di SAN PIETRO, to the North-North-West point of ISOLA di SAN PAOLO.

(d) ISOLA di SAN PAOLO extends South-Eastwards for approximately 450 yards from the point where it joins the submerged Breakwater.

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The Outer Harbour is entered from the South, through an opening 1,600 yards wide, 12 to 15 fathoms deep. The entrance is between the Breakwater at the South-East of ISOLA di SAN PAOLO, and the West end of DIGA di SAN VITO, a submerged Breakwater which extends North-West, turning to West for 1,865 yards, from a point on the Mainland 2,300 yards North of CAPO di SAN VITO. On the Eastern side of the Harbour, a submerged Breakwater, the DIGA di TARANTOLA, curves out to sea in a North-Westerly direction for 2,630 yards, from a point 1,300 yards South-West of the "Y" shaped jetty on the East Shore. There is a break in it 410 ft. wide, at a point 460 yards from the coast.

(ii) MAR PICCOLO, or Inner Harbour, has a depth at entrance of $5\frac{1}{2}$ fathoms, ruling depths within 4 to 5 fathoms. It is a Lake, divided into a Western and an Eastern Basin (each $1\frac{1}{2}$ square miles) by a projection of land which extends about $1\frac{1}{2}$ miles Southward from the Northern Shore and terminates in PUNTA PENNA, a long narrow point. Exit and entry are from the Western Basin.

The Naval Dockyard occupies the whole of the Southern shore of the Western Basin. Between the two Dry Docks there is a small basin which is used by small craft, barges, etc.

(iii) PORTO MERCANTILE, or Commercial Port, is in the North-North-East corner of the MAR GRANDE. Ships drawing up to 26 ft. can enter the Port, ruling depths inside 44 fathoms. It is protected by two moles, the Western projecting South-South-Eastward, the Southern Mole projecting South-Westward. These moles are quayed. The Port is approached from the South, through an unprotected entrance 580 ft. wide, between the Western Quay and the South Mole.

The main traffic in the Port is of the coastal type, but increasing use is being made of it for the export of Military equipment; as many as five medium tanks, 20 armoured cars and about 20 M/T have been seen on the Quay awaiting shipment.

For details of quays, jetties, etc., in the above, see Wharfrage and Cranage below.

MAR GRANDE and MAR PICCOLO are linked by a Canal, CANALE NAVIGABILE, which lies at the South-Eastern end of TARANTO VECCHIA Island. It is 420 yards long and 80 yards wide between the Quays which line it. Depth of water in the Canal, 39 ft. It is 63 yards wide between the piers of the vulnerable Iron Swing Bridge by which it is spanned.

The Bridge over the CANAL, is 290 ft. long and 45 ft. wide; the charted depth of water under it is 39 ft. It opens Northward. When closed the Bridge is used by tram, motor and pedestrian traffic, and allows headroom of about 48 ft. under the centre. It is probable that the building at the root of the Bridge, on the North side of CASTEL SAN ANGELO, is the engine house in which is the machinery, probably electric, for working the Bridge.

A second Channel, about 100 yards wide, at the North-West end of TARANTO VECCHIA Island joins MAR PICCOLO with the PORTO MERCANTILE. It is spanned by a stone bridge, the PONTE PORTA NAPOLI, with three arches which provide passages for boats. The bridge is 515 ft. long and 45 ft. wide and carries part of the Aqueduct which supplies water to the Town; the charted depth under it is 9 ft.

Mooring Buoys

There are Mooring Buoys in the MAR PICCOLO and MAR GRANDE. In the Western Basin of the former there is a large number of them.

Accommodation

Battleships and heavy Cruisers in MAR GRANDE; Destroyers and light Cruisers in MAR PICCOLO. Vessels up to 19,500 tons have been seen in PORTO MERCANTILE.

Method of Discharge

Mostly by lighters, except in the Commercial Port, where loading and unloading is usually

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The main traffic in the Port is of the coastal type, but increasing use is being made of it for the export of Military equipment; as many as five medium tanks, 20 armoured cars and about 20 M/T have been seen on the Quay awaiting shipment.

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A second Channel, about 100 yards wide, at the North-West end of TARANTO VECCHIA Island joins MAR PICCOLO with the PORTO MERCANTILE. It is spanned by a stone bridge, the PONTE PORTA NAPOLI, with three arches which provide passages for boats. The bridge is 515 ft. long and 45 ft. wide and carries part of the Aqueduct which supplies water to the Town; the charted depth under it is 9 ft.

Mooring Buoys

There are Mooring Buoys in the MAR PICCOLO and MAR GRANDE. In the Western Basin of the former there is a large number of them.

Accommodation

Battleships and heavy Cruisers in MAR GRANDE; Destroyers and light Cruisers in MAR PICCOLO. Vessels up to 19,500 tons have been seen in PORTO MERCANTILE.

Method of Discharge

Mostly by lighters, except in the Commercial Port, where loading and unloading is usually direct to and from Quays. (See Wharfrage and Cranage.)

Wharfrage and Cranage

PORTO MERCANTILE (Commercial Harbour)

Western Mole

Length: Up to 1,540 ft. of Berths.

Width: 170 ft.

Depth alongside 26 ft.

Method of Discharge: Alongside Mole. North-North-East Quay at Northern end of Mole: Stern-to. Loading and unloading generally from and on to Quays.

Clearance from Quays: Railway connects with State Main Line by single track, which branches, on the Quay, into four lines. Road: Quays served by main BARI-FASANO-BRINDISI Road.

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Eastern Mole : "L" shaped :—

Length : 600 ft.

Width : 70 ft.

Depth alongside : 17-26 ft.

Method of Discharge : Generally stern-to. Quayage this side of the Port is very narrow and its irregular shape prevents large vessels from tying up alongside.

Clearance from Quay : By road.

There are no Cranes on the Quays of the Commercial Port.

The following is a List of PIERS and JETTIES in the Port, and of Quays under construction.

MAR PICCOLO

(i) Railway Jetty, projecting East from Western shore of Western Basin :—
Length 1,100 ft.

Depth alongside : 6 ft. ; at head, 24 ft.

Clearance from Quays : A single line from the Main Railway Station runs to the Jetty and branches out into two lines on the Jetty.

(ii) "T" Jetty, West side of PENNA Point :—

Length : Upright of "T" , 560 ft.

Transverse : 375 ft.

Depth of water at head : 24 ft. Used as an Oil Discharging Point.

(iii) "L" Jetty, on East side of PENNA Point :—

Length : 430 ft.

Depth alongside : 7 ft.

Train Ferries have been secured to the Jetty. A single standard gauge line runs to the Ammunition Dump at its base. There are three "V" roofed sheds on the Quayside for covering rolling stock.

(iv) Mole under construction (May, 1942), North-East corner of East Basin :—
Length : 350 ft.

(v) Jetty, projecting North-West from South shore of Eastern Basin, at IL FRONTE :—
Length : 1,900 ft.

Used as an Oil Discharge Point.

(vi) Stone Jetty, 1,650 yards East of Seaplane Station :—

Length : 350 ft. (incomplete at end).

Depth at head : 6 ft.

(vii) Jetty, 1,130 yards East-North-East of Government Dock :—
Length : 90 ft.

(viii) Pier, 850 yards East-North-East of Government Dock :—

Length : 840 ft.

Depth, North side : 30 ft. at base, 24 ft. at head.

(ix) "L" Jetty at Submarine Base, Western Basin :—
Length : 535 ft.

Across end : 600 ft.

Quays are being extended immediately East of the Government Dock.

MAR GRANDE North Shore

- (i) Railway Jetty, projecting East from Western shore of Western Basin :—
Length 1,100 ft.
Depth alongside : 6 ft. ; at head, 24 ft.
Clearance from Quays : A single line from the Main Railway Station runs to the Jetty and branches out into two lines on the Jetty.
- (ii) "T" Jetty, West side of PENNA Point :—
Length : Upright of "T", 560 ft.
Transverse : 375 ft.
Depth of water at head : 24 ft. Used as an Oil Discharging Point.
- (iii) "L" Jetty, on East side of PENNA Point :—
Length : 430 ft.
Depth alongside : 7 ft.
- Train Ferries have been secured to the Jetty. A single standard gauge line runs to the Ammunition Dump at its base. There are three "V" roofed sheds on the Quayside for covering rolling stock.

- (iv) Mole under construction (May, 1942), North-East corner of East Basin :—
Length : 350 ft.
Used as an Oil Discharge Point.
- (v) Stone Jetty, 1,650 yards East of Seaplane Station :—
Length : 350 ft. (incomplete at end).
Depth at head : 6 ft.
- (vi) Jetty, 1,130 yards East-North-East of Government Dock :—
Length : 90 ft.
- (vii) Pier, 850 yards East-North-East of Government Dock :—
Length : 840 ft.
Depth, North side : 30 ft. at base, 24 ft. at head.
- (ix) "L" Jetty at Submarine Base, Western Basin :—
Length : 535 ft.
Across end : 600 ft.

Quays are being extended immediately East of the Government Dock.

MAR GRANDE North Shore

- (i) Pier, projecting South, 850 yards East of RONDINELLA Point :—
Length : 205 ft.
- (ii) Pier, projecting South, 1,460 yards East of RONDINELLA Point :—
Length : 170 ft.
Served by road and railway.

East Shore

- (iii) Jetty, projecting South-West, 200 yards South-East of CASTEL SAN ANGELO :—
Length : 135 ft.
Depth at head : 6 ft.
Served by road.
- (iv) Pier, projecting South-West, 500 yards South-East of CASTEL SAN ANGELO :—
Length : 200 ft.
Served by road.

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(v) "L" Jetty, projecting South-West, 1,530 yards South-East of CASTEL SAN ANGELO.
Length : 170 ft. by 150 ft.

(vi) NEW DOCK Quays:—The gravel excavated from the Dock is being used to reclaim land for quays to the North and South of the Dock. The Quay to the North will extend for approximately 1,400 yards, with an average width of 200 yards; the Quay to the South will extend for approximately 680 yards to the "Y" shaped Jetty, and will have an average width of 220 yards.

(vii) "Y" Jetty, projecting North-West, 1,330 yards North-North-East of DIGA di TARANTOLA.

Length of Base : 900 ft.

Length of Arms : 420 ft.

Length available for berths : 445 ft.

Used as an Oil Discharge Point—Pipeline from Oil Storage Tanks on to Jetty.

(viii) "L" shaped Jetty under construction (May, 1942) on the North side of DIGA di TARANTOLA. The Quay extends from the shore for 800 ft. alongside the Breakwater with 500 ft. for berths at end. To the North-East it is reduced to an average width of 480 ft. with 600 ft. for berths.

(ix) Jetty, approximately 1,085 yards East-North-East of DIGA di SAN VITO.
Length : 360 ft.

A channel, 180 ft. wide, has been dredged through the offshore sandbanks to the Jetty.

South-West Shore

SAN PAOLO Island

Boat Harbour, with depths of 11–13 ft. formed by two moles on the Northern side of the Island : the greater depth is by the Eastern Mole which is the longer. The Harbour is reserved for Tugs and Government Craft.

SAN PIETRO Island

Pier, projecting North-North-East from the East side of the Island—

Length : approximately 200 ft.

Depth of water close by : 13 ft.

Crane at head.

Other cranes (excluding those in TOSI's Shipbuilding Yard).

On shore

(a) A crane travelling on a platform between the Railway and the Jetty, 1,130 yards East-North-East of the Government Dock.

(b) Two travelling cranes, one on each side of PRINCIPE di NAPOLI Dock.

(c) One large fixed crane on circular platform between PRINCIPE di NAPOLI Dock and Submarine Base.

In Harbour

Six Floating Cranes.

One Floating Crane used for lifting stone blocks.

Nine sheerlegs, to lift 12–160 tons.

Trade

Imports : Coal, phosphates, lumber, bricks, benzine, naphtha, sugar.

Exports : Cement, oil, fruits, wine, shell-fish.

Estimated Daily Capacity

TARANTOLA. The Quay extends from the shore for 800 ft. alongside the Breakwater with 500 ft. for berths at end. To the North-East it is reduced to an average width of 480 ft. with 600 ft. for berths.

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Exports : Cement, oil, fruits, wine, shell-fish.

Estimated Daily Capacity

Commercial Port.—800 d.w. tons Military Stores, exclusive of M/T of which for every 100 vehicles unloaded the amount would be reduced by 400 tons.

Harbour Craft

Two Bucket Dredgers, 16 Tugs, Water-Carriers and a large number of Lighters have been seen in Harbour. No further particulars known.

Warehouses and Stacking Space

Three sheds on the West Quay of Commercial Port.

Many of the Factory type of buildings between the Commercial Port and the Railway Station could be used for storage purposes.

Coal, Oil and Water

Coal and Water : No information.

Oil : See paragraph (4) GOVERNMENT ESTABLISHMENTS.

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Docks, Slipways and Repair Facilities

Dry Docks

There are two Government Dry Docks, the larger of which will take a 35,000-ton battleship, the smaller a 10,000-ton cruiser. Their dimensions are as follows:—

	Overall Length.	Width at Top of Entrance.	Depth at Sill.	Width at Sill.	Width at 13 ft. above Sill.
No. 1: GENERALE E. FERRATI Dock.	ft. 820	ft. in. 139 9	ft. in. 39 4	ft. in. 115 5	ft. in. 128 6
No. 2: PRINCIPE di NAPOLI (This can be divided into two docks by means of a lock gate.)	711	109 6	81 4	—	96 5

A graving dock is under construction, in position 2,300 yards, 105° from SECCA della TARANTOLA Beacon.

When completed it will consist of an inner dock and an outer basin. The walls of the inner dock had been half finished by 7th February, 1942, and its completed dimensions are estimated at 830 ft. long by 140 ft. wide.

The pumping apparatus for the new dock is in position, sections being assembled on the site. Pipes run from the apparatus to the end of the dock where, before the walls were erected, three pipes could be seen to emerge.

All round the dock, ground clearance and levelling is progressing in preparation for workshops and other repair installations.

The dock will eventually be linked by railway to the BARI, BRINDISI, NAPLES line by means of a tunnel which starts from the East side of the GOVERNMENT DOCK in the NAVAL DOCKYARD.

The dockyard administrative buildings and M/T depot are situated on the ridge to the East of, and behind the, PRINCIPE di NAPOLI Dock. They are connected to the dockyard by a ramp for vehicles and a foot bridge.

Floating Docks

There are seven floating docks, of the following dimensions:—

	Overall Length.	Width at Top.	Width at Sill.	Depth at Sill.	Lift in Tons.
G.O.2	ft. in. 147 7	ft. in. 29 6	ft. in. 26 3	ft. in. 10 10	150
G.O.4	105 0	26 5	23 4	9 2	100
G.O.9	217 9	37 0	32 0	—	450
G.O.10	?	?	?	?	2,900
G.O.11	459 6	90 7	65 1	33 4	2,000
G.O.13				Depth at Entrance.	15,000
G.O.18	328 0	Width. 43 6	—	16 5	1,200

Slipways

See under (5) COMMERCIAL ESTABLISHMENTS and Section V (2).

Facilities for Clearing Port Area

A graving dock is under construction, in position 2,300 yards, 105° from SECCA della TARANTOLA Beacon.

When completed it will consist of an inner dock and an outer basin. The walls of the inner dock had been half finished by 7th February, 1942, and its completed dimensions are estimated at 830 ft. long by 140 ft. wide.

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	Overall Length.	Width at Top.	Width at Sill.	Depth at Sill.	Lift in Tons.
G.O.2 ..	ft. in.	ft. in.	ft. in.	ft. in.	150
G.O.4 ..	147 7	29 6	26 3	10 10	100
G.O.9 ..	105 0	26 5	23 4	9 2	450
G.O.10 ..	217 9	37 0	32 0	—	2,900
G.O.11 ..	—	—	—	—	2,000
G.O.13 ..	459 6	90 7	65 1	33 4	15,000
		Width.		Depth at Entrance.	
G.O.18 ..	328 0	43 6	—	16 5	1,200

Slipways

See under (5) COMMERCIAL ESTABLISHMENTS and Section V (2).

Facilities for Clearing Port Area

Quays in the Commercial and Inner Harbours served by railway and road, see Wharfage and Cranage above.

(3) The Town

This is divided into the Old and the New Town, or TARANTO VECCHIA and TARANTO NUOVO, and is situated in the North-West corner of the MAR GRANDE. TARANTO VECCHIA, in which is the Cathedral, is on an Island which is joined to the Mainland at one end by the PONTE PORTA NAPOLI, and at the other to TARANTO NUOVO by the swing bridge over the CANALE NAVIGABILE.

The residence of the Naval Commander-in-Chief is situated at the South-East corner of the entrance to the CANALE NAVIGABILE.

Population

117,722 in 1941

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Water Supply

The Town is supplied by an Aqueduct, part of which is carried by the PONTE PORTA NAPOLI, which joins TARANTO VECCHIA Island at its North-West end to the Mainland.

The Water Supply for the Naval Dockyard is drawn from the hills in the district by an Aqueduct 9 miles long.

Between the PRINCIPE di NAPOLI Dock and Submarine Base in the Naval Dockyard there is a covered Water Reservoir 230 ft. by 190 ft. with a Water Tower adjoining.

Another Water Tower is situated on an embankment on the West side of the railway, 1,280 yards West of Tosi's Shipbuilding Yards.

(4) Government Establishments*Naval Dockyard*

The Naval Dockyard is situated on the South shore of the MAR PICCOLO and occupies an area of about 150 acres, surrounded by a wall 23 ft. high. It is well protected by the Town, and is not visible from seaward.

The Yard is divided into three administrative sections—Ordnance, Torpedo and Engineering. The first two are under the command of a Naval Captain and are staffed by officers of Armi Navali and torpedo officers. There are also civilian technical officers in each department. The personnel normally employed is:—

Engineering and Electrical Section	..	..	..	3,500
Ordnance Section	..	..	..	1,600
Torpedo Section	..	..	..	300

A report on December, 1940, stated that there are 9,800 employees in the Dockyard.

The general capacity is judged to be sufficient to deal simultaneously with normal refitting of one Battleship, one Cruiser and four Destroyers or Submarines. The Torpedo Storage is large and accommodates, at an estimate, 200 torpedoes. There is a Torpedo Pier and range at IL PIZZONE Point.

The Yard is solely a Docking and Repair Yard. The machinery is partly driven by electricity from a Central Electric Power Station.

Large workshops and steam furnaces exist in the Naval Dockyard, extending from the Government Dock along the water front to the Torpedo Boat Station. Approximately 200 yards South-East of the PRINCIPE di NAPOLI Dock a new building, possibly a Workshop, is under construction (5/42) which, when finished, will measure 355 ft. by 75 ft.

There is a Torpedo Workshop and a large clothing and Victualling Department.

Barracks

- (i) East of the Seaplane Hangars, on the foreshore South of the Eastern Basin of MAR PICCOLO, a group of 21 Buildings, believed to be Barracks.
- (ii) A large hexagonal enclosure approximately 100 yards North of the Main Railway Station at IL BORGO della STAZIONE, which includes 26 large huts and prepared sites for five more.
- (iii) 460 yards South-West of the PRINCIPE di NAPOLI Dry Dock, 12 Barrack blocks, divided diagonally by a long low building which may be used for storage or M/T.
- (iv) Sited due North of CASTEL S. ANGELO, on the shore of MAR PICCOLO, five blocks of buildings are believed to be Barracks.

M/T Depôts

M/T depôts are situated in the following positions:—

- (i) 270 yards South-East of GOVERNMENT DOCK, six buildings, 135 ft. by 35 ft. in a walled enclosure.
- (ii) Additional Dockyard Administrative Buildings on ridge South-West of Naval

an area of about 100 acres, surrounded by a wall 23 ft. high. It is well protected by the town, and is not visible from seaward.

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M/T Depôts

M/T depôts are situated in the following positions:—

- (i) 270 yards South-East of GOVERNMENT DOCK, six buildings, 135 ft. by 35 ft. in a walled enclosure.
- (ii) Adjoining Dockyard Administrative Buildings on ridge South-West of Naval Dockyard.
- (iii) 560 yards West-North-West of base of Western Mole of Commercial Port, between coast road and railway. A large walled enclosure divided by a building 440 ft. by 25 ft. In each division there is a building with a double "V" roof 355 ft. by 75 ft.

Hospitals

Buildings marked with GENEVA CROSSES are situated in the following positions:—

- (a) Large hospital on ridge South of oil storage at the Submarine Base.
- (b) "U" shaped building on ridge above railway, 365 yards North of railway jetty, North-East of main railway station.
- (c) On West side of TARANTO-CRISPIANO road approximately 800 yards North-North-East of main railway station.

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- (d) On North-West side of the ARCHITA Battery.
- (e) A building enclosing a quadrangle, 760 yards South by East of the PRINCIPE DI NAPOLI dry dock.
- (f) Large irregular shaped building on South side of the CANTANZARO road, 2,100 yards East-North-East of RONDINELLA POINT (possibly the principal Naval Hospital).

Factories

The main factory area is situated between the COMMERCIAL Port and the Main Railway Station. There are Establishments in other parts of the Port as follows:—

- (a) A small by-products plant covering an area approximately 200 yards square adjoins the West side of the Power Station on the North shore of the MAR GRANDE.

Coal is off-loaded from the railway and conveyed on an elevator to the centre of the plant, where it is converted.

In the compound there are three containers 35 ft. diameter, and three containers, 25 ft. diameter.

- (b) Factory with rail communication covering an area 270 yards by 115 yards, narrowing to 40 yards at its West end, is situated between shore and railway, approximately 1½ mile West of Western Mole of Commercial Port.

- (c) Factory covering an area approximately 220 yards by 60 yards on foreshore, 120 yards West of the ARCHITA Battery.

- (d) Approximately 1,350 yards North-East of CAPE SAN VITO, there is a large, thickly wooded, walled enclosure in which there are two tall buildings, 270 ft. by 140 ft., one of which is damaged, and a number of subsidiary buildings.

There is also a store, 35 ft. square, and a small cemetery.

The Establishment is linked by buried cables to a C.D. battery at CAPE SAN VITO and a C.D. Battery on the coast 1 mile North-North-East of CAPE SAN VITO.

It is also linked by telephone to an ammunition store, 530 yards North-North-West of CAPE SAN VITO.

Fuel Storage

There are 11 distinct groups of oil tanks, six of which are situated approximately 2 miles South-East of the Town on the East shore of the MAR GRANDE and are dependent at present on one discharge point, the "Y" jetty south of the dry dock under construction. To the North of the Jetty the new quayage provided by the spoil from the dry dock will form an oil quay. Two new pipes have been laid across the quay and a new pumping station built.

The tanks are situated in the following positions:—

- (i) Along foreshore at base of "Y" Jetty there are four buried tanks, each 120 ft. diameter, and one buried tank, 60 ft. diameter.
- (ii) 620 yards East of the base of the "Y" Jetty is a rectangular concrete construction, 1,370 ft. by 345 ft., surrounded by a concrete or earth work. This is linked to the Jetty by pipeline, and is believed to be a covering for a number of small tanks. At intervals around the breastwork surrounding the Oil Store are towers which are thought to be used for fire fighting.
- (iii) 1,480 yards North-East of the base of the "Y" Jetty there is a group of five buried tanks, each 120 ft. in diameter.
- (iv) 2,000 yards East-South-East of the base of the "Y" Jetty there is a group of five buried tanks, each 120 ft. in diameter.
- (v) 2,420 yards East of the base of the "Y" Jetty there is a group of five buried tanks, each 120 ft. in diameter.

containers, 25 ft. diameter.

(b) Factory with rail communication covering an area 270 yards by 115 yards, narrowing to 40 yards at its West end, is situated between shore and railway, approximately 1 1/4 mile West of Western Mole of Commercial Port.

(c) Factory covering an area approximately 220 yards by 60 yards on foreshore, 120 yards West of the ARCHITA Battery.

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- (iv) 2,000 yards East-South-East of the base of the "Y" Jetty there is a group of five buried tanks, each 120 ft. in diameter.
- (v) 2,420 yards East of the base of the "Y" Jetty there is a group of five buried tanks, each 120 ft. in diameter.
- (vi) 2,420 yards South-East of the base of the "Y" Jetty there is a rectangular concrete construction, 700 ft. by 370 ft. This is also believed to be a covering for a number of smaller tanks.
- (vii) Another of these storage units is thought to be under construction North of the Oiling Jetty.
- (viii) *Dockyard*.—Behind the dock buildings at the East end of the Torpedo Boat Station. Three large and seven medium Tanks, of capacities about 5,000 and 2,600 tons each respectively, with a mottled camouflage. There are also four medium Tanks, not camouflaged, and one large Tank immediately West of and adjoining the camouflaged Tanks.
- (ix) *PENNA Point*.—There are eight large Tanks, each 95 ft. in diameter, probably of 5,000 tons capacity each, on the point. On the East side of the headland there is some form of underground storage: seen as a row of ten mounds parallel with the shore.

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- (x) 1,700 yards North of PENNA Point, just East of C. RICCARDI, four large and three smaller tanks, capacity about 5,000 and 2,500 tons each respectively. The Tanks are connected by pipeline to the "T" Jetty on the West side of PENNA Point.
- (xi) At IL FRONTE, approximately 2½ miles East of the Naval Dockyard, five concrete tanks, each 125 ft. square, divided into seven compartments, were under construction in February, 1941, between the shore and railway. These are connected to a jetty, 1,900 ft. long, by pipeline. The Tanks are now believed to be in supply as a Tanker is known to have used the Oil Jetty.

(5) Commercial Establishments

Shipbuilding Yard (Cantieri Navali Franco Tosi.—See also Section V (2)).

The large Building Yard of CANTIERI NAVALI FRANCO TOSI is situated on the North shore of the Western Basin of the MAR PICCOLO, 3,000 yards North-North-West of PENNA Point.

It possesses 10, probably 11 building slips.

There are extensive workshops behind the slips, and in the absence of steam furnaces it is thought that only electric power is used.

Behind the Workshops on the West side is a dump of girders. Two cranes, operating on a wall running the whole length of the workshops, feed the plant from the dump.

Considerable alterations have been made to the Eastern half of the Yard, in the last six months. Several buildings have been reconstructed to extend the facilities already at hand.

A small stream which used to cross the Eastern half of the Yard has been diverted, its bed is now filled in and a new slip built in the position.

There is a small fitting-out basin in the centre of the Yard, with a Mole, 670 ft. long, alongside submarine building sheds, a quay at end of basin, 190 ft. long, and a quay on the East side of the basin, 340 ft. long.

The length of the Mole on its West side adjoining the submarine sheds is only 330 ft.

In the Western half of the Yard there are eight cranes, two others are situated, one on the Mole and one in the Eastern half. Between the new building slips an area has been concreted and rails laid, it is probable that another crane will be put in operation there.

The Yard is linked by a single line railway to the TARANTO-BRINDISI line which it meets at a junction 660 yards North-North-West of the Yard. Branch lines run between the workshops.

(7) Air Facilities**Seaplane Base**

Situated on the South shore of the East basin of the MAR PICCOLO, 2,000 yards East of the Naval Dockyard.

Hangars

The base possesses four hangars, one of which has been badly damaged. Foundations have been laid for a large double hangar East of the existing ones.

Their dimensions from West to East are:—

- (i) 375 ft. by 130 ft., badly damaged.
- (ii) 210 ft. by 110 ft., with an entrance of 175 ft.
- (iii) 230 ft. by 110 ft., with an entrance of 165 ft.
- (iv) 265 ft. by 100 ft., with an entrance of 220 ft.
- (v) 320 ft. by 175 ft., double hangar under construction.

Workshops and Administrative Buildings

The workshops are grouped around the hangars and the main administrative building is situated on the cliff to the West of the hangars.

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- (v) 320 ft. by 175 ft., double hangar under construction.

Workshops and Administrative Buildings

The workshops are grouped around the hangars and the main administrative building is situated on the cliff to the West of the hangars.

Cranes and Slipways

There are three cranes for handling the seaplanes and three slipways.

Dispersal

The Seaplanes are moored chiefly in the MAR PICCOLO, opposite the hangars, but they have sometimes been seen pulled up on the North shore, East of the ammunition dump at BUFFOLUTO.

M/T Depot

The Seaplane Base is linked to the TARANTO-HARBOUR Railway by a single line ramped down from a small station just South of the Barracks on the cliff to sidings behind the Barracks on the foreshore.

Little use appears to be made of this line.

A good road climbs the cliff to the West of the hangars and links up with the TARANTO-BRINDISI road.

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Aerodromes

Situated approximately 9½ miles East-North-East of TARANTO; 1½ mile South-West of GROTTAGLIE on North side of TARANTO-BRINDISI road.

Dimensions

The Aerodrome is "H" shaped with its base in the East.

The dimensions of the legs are: North leg 1,300 yards by 700 yards; South leg 1,320 yards by 670 yards.

The longest run available, 1,820 yards, is from North to South.

Hangars

There are three airship type hangars in the centre of the East side. Their dimensions from West to East are:—

- (i) 460 ft. (ii) 315 ft. (iii) 370 ft.

Workshops and Administrative Buildings

These adjoin the hangars.

Dispersal

Aircraft are dispersed around the perimeter and in a small plantation in the centre of the West side opposite the hangars.

Seventeen Blast Shelters have been built around the boundaries of the Southern leg. Their disposition is as follows:—East side, 3; South side, 7; West side, 5; Centre West side 2. Each has an aperture of 95 ft.

Communications

A branch line from the TARANTO-BRINDISI Railway runs to the hangars and buildings in the centre of the East side.

The main TARANTO-BRINDISI road passes the Southern boundary and the Aerodrome is linked to it by a good road from the hangars running parallel to the branch line of the railway, and by a short road from the Southern perimeter track.

W/T

What appears to be a radial earthing system with central hut is visible situated 880 yards North-East of the hangars. No masts, however, are visible.

It is reported that a new Aerodrome is projected to the South of the Port where land has been reclaimed.

(8) War Material Factories

It is not known whether the Factories described under paragraph (4) GOVERNMENT ESTABLISHMENTS are producing War Material.

(9) Power Plants

A new Power Station lies on the Northern shore of MAR GRANDE, approximately 1,500 yards West of BORGO della STAZIONE. The main electrical supply is by means of a grid system from the interior to a transforming station with a small open transformer adjoining, situated 430 yards North-North-West of the main railway station at IL BORGO STAZIONE.

Four lines converge on the transformer: one from the North-West, to the East of and running parallel to the TARANTO-MASSAFRA road; one from the North, to the West of and running parallel to the TARANTO-CRISPIANO road; and two from the East.

The line from the North was being installed in January, 1942.

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Four lines converge on the transformer: one from the North-West, to the East of and running parallel to the TARANTO-MASSAFRA road; one from the North, to the West of and running parallel to the TARANTO-CRISPIANO road; and two from the East.

The line from the North was being installed in January, 1942.

The two lines from the East run together to the North of and parallel to the TARANTO-GROTtaglie Railway, diverging North of the ammunition dump at BUFFULUTO, one line continuing to run parallel to the railway, and the other running to the Salt Marsh North of the Main Railway Station before turning South to the Transformer.

From a point 400 yards South of the GOVERNMENT DOCK three lines of poles run parallel to each other towards the dry dock under construction on the East shore of the MAR GRANDE.

These are believed to be for local distribution as from their size it is estimated that they carry a much lower voltage than those North of TARANTO. Their source in TARANTO and the terminals in the South have not been located.

A supply for local use is generated at a small thermic power station with a small open transformer adjoining on its East side. Situated between the coast road and railway 830 yards West of Western Mole of Commercial Port.

Gasometer

The Gas supply is produced at a small gas works immediately North of the main railway station.

It possesses two wet type gas holders, one 70 ft. diameter, and the other 50 ft. diameter. There is no rail communication and there are only small coal stocks.

(10) Transport Facilities*Roads*

Good road communication is afforded with all parts of Italy.

The following are details of first class roads radiating from TARANTO :—

(i) TARANTO-CATANZARO Coast Road

The road is 30/35 ft. wide with a good surface, and runs parallel with the railway on the inland side. At intervals along the road are spaces for road mending materials.

Along the road from TARANTO are the following bridges :—

- (a) Concrete bridge over railway 100 ft. by 35 ft. including parapets. Situated 2,000 yards 024° from RONDINELLA POINT.
- (b) Concrete bridge over river 70 ft. by 35 ft., including parapets. Situated 3,400 yards 347° from RONDINELLA POINT.

(ii) TARANTO-BARI Road via MASSERA

The road is 30/35 ft. wide with a good surface.

Along the road from TARANTO is the following bridge :—

Masonry tunnel for railway beneath the road, width of carriage way unaltered.

The road is ramped up on the North side and has a metal work parapet.

Situated 4,300 yards, 010° from RONDINELLA POINT.

(iii) TARANTO-FASANO Road via MARTINA FRANCA

The road is 30/35 ft. wide with a good surface.

Along the road from TARANTO is the following bridge :—

Concrete and masonry bridge over open ground and railway, 190 ft. by 40 ft., including footpaths and parapets.

Situated 325 yards, 055° from main railway station.

The South end of the bridge, 85 ft. long, is built of masonry, consisting of four arches spanning open ground, whilst the rest of the bridge consists of a single span built of concrete over the railway.

(iv) TARANTO-BRINDISI Road via S. GIORGIO and GROTTAGLIE

The road is 30/35 ft. wide with a good surface.

Railways

Good rail communication is afforded with all parts of Italy and the following is a detail of the system.

The Main Station is situated in the suburb of IL BORGO STAZIONE and handles both passenger and goods traffic.

Three lines serve the station and three lines form sidings to the North.

On the North side of the sidings is an engine shed together with two turntables, coal stocks, and water supply.

Behind the station buildings there is a wagon repair depot consisting of three large top lit buildings; wagons are shunted on a single line from the main track into the depot compound and then shunted individually into the workshops.

Warehouses adjoin both sides of the station, and sidings forming a goods depot are situated to the West, at the base of the Western quay of the Commercial Ports.

A. TARANTO-CATANZARO Line

- (a) Concrete bridge over railway 100 ft. by 35 ft. including parapets. Situated 2,000 yards 024° from RONDINELLA POINT.
- (b) Concrete bridge over river 70 ft. by 35 ft., including parapets. Situated 3,400 yards 347° from RONDINELLA POINT.
- (ii) *TARANTO-BARI Road via MASSERA*
The road is 30/35 ft. wide with a good surface.
Along the road from TARANTO is the following bridge :—
Masonry tunnel for railway beneath the road, width of carriage way unaltered.
The road is ramped up on the North side and has a metal work parapet.
Situated 4,300 yards, 010° from RONDINELLA POINT.
- (iii) *TARANTO-FASANO Road via MARTINA FRANCA*
The road is 30/35 ft. wide with a good surface.
Along the road from TARANTO is the following bridge :—
Concrete and masonry bridge over open ground and railway, 190 ft. by 40 ft., including footpaths and parapets.
Situated 325 yards, 055° from main railway station.
The South end of the bridge, 85 ft. long, is built of masonry, consisting of four arches spanning open ground, whilst the rest of the bridge consists of a single span built of concrete over the railway.
- (iv) *TARANTO-BRINDISI Road via S. GIORGIO and GROTTAGLIE*
The road is 30/35 ft. wide with a good surface.

Railways

Good rail communication is afforded with all parts of Italy and the following is a detail of the system.

The Main Station is situated in the suburb of IL BORGO STAZIONE and handles both passenger and goods traffic.

Three lines serve the station and three lines form sidings to the North.

On the North side of the sidings is an engine shed together with two turntables, coal stocks, and water supply.

Behind the station buildings there is a wagon repair depot consisting of three large top lit buildings; wagons are shunted on a single line from the main track into the depot compound and then shunted individually into the workshops.

Warehouses adjoin both sides of the station, and sidings forming a goods depot are situated to the West, at the base of the Western quay of the Commercial Ports.

A. TARANTO-CATANZARO Line

This line follows the coast from the Main Station and is a double track as far as the junction of the BARI line, 1,100 yards, 020° from RONDINELLA Point. It then continues towards CATANZARO as a single line.

Two lines run along the coast side of the main track from the main station to sidings opposite the power station.

A single line continues beside the main track from these sidings to extensive sidings on the East side of a factory 1,500 yards, 078° from RONDINELLA Point.

Along the line from TARANTO are the following bridges :—

- (i) Concrete or masonry bridge, 20/25 ft. span, carrying a double track over a narrow gauge railway.
Situated 50 yards South of the junction of the BARI and CATANZARO lines.
- (ii) Lattice girder bridge, 100 ft. span, carrying a single line over a river, 3,330 yards, 346° from RONDINELLA Point.

TARANTO 309

F. BARI LOOP LINE

This single line railway branches Eastward from the TARANTO-BARI Line, 4,300 yards, 005° from RONDINELLA Point, making a detour of the main station to link up with the BRINDISI and HARBOUR lines at the junction, 760 yards North-North-West of TOSI's Shipbuilding Yard.

This line appears to be little used in normal times, the main traffic going via the main station, but should the main line be blocked at any time this line could be used as an alternative route.

Along the line from West to East are the following bridges:—

- (i) Masonry tunnel beneath road. Length 140 ft. Situated 4,300 yards 010° from RONDINELLA Point.
- (ii) Concrete bridge over stream. Length 40 ft. Situated 2,560 yards 295° from Submarine building sheds in TOSI's Yard.

(11) Signal Communications

W/T Station

There is an unconfirmed report of a High-Power W/T Station situated on the South side of the MAR PICCOLO, just North of the Main Road as shown on Plan 35.

V/S Stations

Several Signal Stations have been established along the shore as follows:—

- (a) Near the Old Tower on RONDINELLA Point.
- (b) At ARCHITA.
- (c) On Cape SAN VITO, 1,000 yards North of the Lighthouse.
- (d) On SAN PIETRO Island.
- (e) On SAN PAOLO Island.

Cables

A Submarine cable runs from RONDINELLA Point, through SAN PIETRO and SAN PAOLO Islands to Cape SAN VITO, connecting the defence works in these localities.

(12) Defences

(i) Seafront Defences

(a) Coast Defence Batteries (Zero Lines indicate centre of arc of fire)

Battery No.	Location and Description.	Armament.	Grading.		Date of Latest Report.
			No. and Position.	Calibre.	
1	RONDINELLA Point: 240 yards to the East, close to the shore. These guns are believed to be for harbour defence. The crews for this and A.A. Battery 1 nearby are in two huts on RONDINELLA Point. Adjoining these huts is a square tower believed to be used as an O.P. Zero line 160°.	3—? calibre (not heavier than 4.5 in.).	A 2	A 2	1942
2	RONDINELLA Point: guns mounted in an "L"-shaped layout. There are five occupied emplacements but it is believed that one is probably a control post. Zero	4—4.7 in. or 6-in.	A 2	B 3	No. and Position 1942, Calibre 1940

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B. TARANTO-BARI Line, via MASSAFRA

From TARANTO Station the same track as the CATANZARO Line is used.
From the junction previously mentioned a single line continues towards BARI.
Along the line from the junction is the following bridge:—
Concrete or masonry bridge, 20/25 ft. span, carrying a single line over road, 2,280 yards, 016° from RONDINELLA Point.

C. TARANTO MARTINA FRANCA, via CRISPIANO

From TARANTO Station a double track follows the North shore of the MAR PICCOLO to a point 1,270 yards, 042° from the Station where a single line turns Northwards, entering a small station 440 yards from the junction.

At this station there is an engine shed and turntable. The line then continues towards CRISPIANO.

Along the line from the main station is the following bridge:—

Concrete bridge, 35 ft. span, carrying a single line over railway, 3,360 yards, 014° from TARANTO Station.

D. TARANTO-BRINDISI Line, via GROTTAGLIE

From TARANTO Station the same track as the MARTINA FRANCA Line is used.

From the junction mentioned in (C) a single line proceeds North-Eastwards to a junction 760 yards North-North-West of TOSI's Shipbuilding Yard. This junction is built on an embankment, has sidings and a turntable on its South side. From the junction a short line runs to TOSI's yard; the line to the NAVAL Dockyard leaves the BRINDISI Line to complete the circuit of the MAR PICCOLO; a line runs Westward to link up with the BARI line; and the BRINDISI line continues Eastwards to GROTTAGLIE.

Along the line from the junction of the MARTINA FRANCA line are the following bridges:—

(i) Iron bridge carrying a single line over river, length 50 ft. Situated 1,450 yards, 276° from Submarine building sheds in TOSI's Yard.

At both ends of the bridge the railway is embanked over marshy ground.

(ii) Iron bridge carrying a single line over road. Length 25 ft. Situated 1,230 yards, 289° from Submarine building sheds in TOSI's Yard.

E. TARANTO NAVAL DOCKYARD

This line follows a circuitous route round the MAR PICCOLO using the BRINDISI line as far as the junction, 760 yards North-North-West of TOSI's Yard. At the East end of the Ammunition Dump at BUFFOLUTO a branch line turns Southward to serve the dump. Approximately 800 yards South-South-East of the oil jetty at IL FRONTE a branch line turns Northward to a small modern station serving the oil storage depôt at IL FRONTE.

At the seaplane Base Barracks on the cliff East of the hangars, there is a small station and sidings, from here a branch line runs down to the Seaplane Base.

The railway then continues to the Naval Dockyard.

The railway is now being extended Southwards from the Naval Dockyard to the New Dry Dock under construction on the East shore of the MAR GRANDE, a distance of over 2,500 yards.

A concrete tunnel is being built by the cut and cover method from the GOVERNMENT DOCK in the NAVAL DOCKYARD, to the New dry dock, but its terminus at this end is not yet known.

The diameter of a section of the tunnel at the South end, before the excavation was filled in, was approximately 40 ft. From this it is estimated that when the tunnel is complete it

from TARANTO Station.

D. TARANTO-BRINDISI Line, via GROTTAGLIE

From TARANTO Station the same track as the MARTINA FRANCA Line is used.

From the junction mentioned in (C) a single line proceeds North-Eastwards to a junction 760 yards North-West of TOSI's Shipbuilding Yard. This junction is built on an embankment, has sidings and a turntable on its South side. From the junction a short line runs to TOSI's yard; the line to the NAVAL Dockyard leaves the BRINDISI Line to complete the circuit of the MAR PICCOLO; a line runs Westward to link up with the BARI line; and the BRINDISI line continues Eastwards to GROTTAGLIE.

Along the line from the junction of the MARTINA FRANCA line are the following bridges:—

- (i) Iron bridge carrying a single line over river, length 50 ft. Situated 1,450 yards, 276° from Submarine building sheds in TOSI's Yard.
- (ii) Iron bridge carrying a single line over road. Length 25 ft. Situated 1,230 yards, 289° from Submarine building sheds in TOSI's Yard.

E. TARANTO NAVAL DOCKYARD

This line follows a circuitous route round the MAR PICCOLO using the BRINDISI line as far as the junction, 760 yards North-West of TOSI's Yard. At the East end of the Ammunition Dump at BUFFOLUTO a branch line turns Southward to serve the dump. Approximately 800 yards South-South-East of the oil jetty at IL FRONTE a branch line turns Northward to a small modern station serving the oil storage depot at IL FRONTE.

At the seaplane Base Barracks on the cliff East of the hangars, there is a small station and sidings, from here a branch line runs down to the Seaplane Base.

The railway then continues to the Naval Dockyard.

The railway is now being extended Southwards from the Naval Dockyard to the New Dry Dock under construction on the East shore of the MAR GRANDE, a distance of over 2,500 yards.

A concrete tunnel is being built by the cut and cover method from the GOVERNMENT DOCK in the NAVAL DOCKYARD, to the New dry dock, but its terminus at this end is not yet known.

The diameter of a section of the tunnel at the South end, before the excavation was filled in, was approximately 40 ft. From this it is estimated that when the tunnel is complete it will be suitable for a double track railway. Work is at present proceeding from both ends.

Along the line from the junction, 760 yards North-North-West of TOSI's Yard, are the following bridges:—

- (i) Iron bridge carrying a single line over dried up river bed. Length 60 ft. Situated 3,830 yards, 037° from PENNA POINT.
- (ii) Concrete bridge carrying a single line over river. Length 370 ft. Situated 2,230 yards 100° from the Mole under construction on the North shore of the MAR PICCOLO, 170 yards West of S. FEDELE Convent.
- (iii) Concrete bridge carrying a single line over stream. Length 30 ft. Situated 2,200 yards 110° from the base of the oil jetty at IL FRONTE.
- (iv) Concrete bridge carrying a single line over road. Length 30 ft. Situated 960 yards 160° from PENNA POINT.

TARANTO 309

F. BARI LOOP LINE

This single line railway branches Eastward from the TARANTO-BARI Line, 4,300 yards, 005° from RONDINELLA Point, making a detour of the main station to link up with the BRINDISI and HARBOUR lines at the junction, 760 yards North-North-West of TOSI's Shipbuilding Yard.

This line appears to be little used in normal times, the main traffic going via the main station, but should the main line be blocked at any time this line could be used as an alternative route.

Along the line from West to East are the following bridges:—

- (i) Masonry tunnel beneath road. Length 140 ft. Situated 4,300 yards 010° from RONDINELLA Point.
- (ii) Concrete bridge over stream. Length 40 ft. Situated 2,560 yards 295° from Submarine building sheds in TOSI's Yard.

(11) Signal Communications

W/T Station

There is an unconfirmed report of a High-Power W/T Station situated on the South side of the MAR PICCOLO, just North of the Main Road as shown on Plan 35.

V/S Stations

Several Signal Stations have been established along the shore as follows:—

- (a) Near the Old Tower on RONDINELLA Point.
- (b) At ARCHITA.
- (c) On Cape SAN VITO, 1,000 yards North of the Lighthouse.
- (d) On SAN PIETRO Island.
- (e) On SAN PAOLO Island.

Cables

A Submarine cable runs from RONDINELLA Point, through SAN PIETRO and SAN PAOLO Islands to Cape SAN VITO, connecting the defence works in these localities.

(12) Defences

(i) Seafront Defences

(a) Coast Defence Batteries (Zero Lines indicate centre of arc of fire)

Battery No.	Location and Description.	Armament.	Grading.		Date of Latest Report.
			No. and Position.	Calibre.	
1	RONDINELLA Point: 240 yards to the East, close to the shore. These guns are believed to be for harbour defence. The crews for this and A.A. Battery 1 nearby are in two huts on RONDINELLA Point. Adjoining these huts is a square tower believed to be used as an O.P. Zero line 160°.	3—? calibre (not heavier than 4.5 in.)	A.2	A.2	1942
2	RONDINELLA Point: guns mounted in an "L"-shaped layout. There are five occupied emplacements but it is believed that one is probably a control post. Zero lines: 3 guns, 305°; 2 guns, 220°.	4—4.7 in. or 6-in.	A.2	B.3	No. and Position 1942, Calibre 1940 or earlier.

W/T Station

There is an unconfirmed report of a High-Power W/T Station situated on the South side of the MAR PICCOLO, just North of the Main Road as shown on Plan 35.

V/S Stations

Several Signal Stations have been established along the shore as follows:—

- Near the Old Tower on RONDINELLA Point.
- At ARCHITA.
- On Cape SAN VITO, 1,000 yards North of the Lighthouse.
- On SAN PIETRO Island.
- On SAN PAOLO Island.

Cables

A Submarine cable runs from RONDINELLA Point, through SAN PIETRO and SAN PAOLO Islands to Cape SAN VITO, connecting the defence works in these localities.

(12) Defences

(i) Seafront Defences

(a) Coast Defence Batteries (Zero Lines indicate centre of arc of fire)

Battery No.	Location and Description.	Armament.	Grading.		Date of Latest Report.
			No. and Position.	Calibre.	
1	RONDINELLA Point: 240 yards to the East, close to the shore. These guns are believed to be for harbour defence. The crews for this and A.A. Battery 1 nearby are in two huts on RONDINELLA Point. Adjoining these huts is a square tower believed to be used as an O.P. Zero line 160°.	3—? calibre (not heavier than 4.5 in.).	A.2	A.2	1942
2	RONDINELLA Point: guns mounted in an "L"-shaped layout. There are five occupied emplacements but it is believed that one is probably a control post. Zero lines: 3 guns, 305°; 2 guns, 220°.	4—4.7 in. or 6 in.	A.2	B.3	No. and Position 1942, Calibre 1940 or earlier. 1942
3	S. PIETRO Island: on PUNTA LA FORCA. There is a magazine protected by three anti-blast walls at the rear of the Battery.	2—? 6 in. or larger	Position A.2	B.3	1942
4	S. PIETRO Island: 125° PUNTA LA FORCA, 800 yards. The guns are in a staggered line. Crews billeted in huts behind the battery. Zero lines: 2 guns 185°; 2 guns 210°.	4—? 4.7 in.	A.2	B.3	1942
5	245° II POSTO Point: 460 yards. Zero line: 160°.	6—?	A.2	—	1942
6	S. PAOLO Island: on the roof of a circular fort. Zero line 225°.	2—? calibre (not heavier than 4.5 in.).	A.2	—	1942
7	S. PAOLO Island: on the West side of a circular fort. Zero line 195°.	4—? 9.2 in.	A.2	B.3	1942
8	LEPORANO	2—heavy? 12 in.	B.3	B.3	1940

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Coast Defence Batteries—continued.

Battery No.	Location and Description.	Armament.	Grading.		Date of Latest Report.
			No. and Position.	Calibre.	
9	110° Cape S. VITO 4½ miles: concrete emplacements, 55 ft. in diameter, under construction on the coast. New roads lead from the coast road to each emplacement; telephone communication is installed. Zero line 198.	3—emplacements only.	A.2	—	1942
10	100° LE MACCHIE Point: 1,130 yards. Battery in a "V"-shaped layout. The command post is in the centre of the Battery behind the guns. There is a sunken magazine between the battery and the shore. There is a trench, 330 yards long, running West from the battery to the shore. Zero lines (point of reference gun at base of "V"): 4 guns 270°; 3 guns 155°.	6—? 4.7-in. or 6-in. (? H.A./L.A.).	A.2	B.3	1942
11	LE MACCHIE Point: guns mounted on a concrete platform behind an earth or concrete bank: the whole position is wired round. Zero line 195°.	?—? calibre	A.2	—	1942
12	113° Cape S. VITO, 2,760 yards: guns mounted in an irregular line on the coast. There are five occupied emplacements but it is believed that one is a control post. Crew billeted in huts behind the battery. Zero line 190°.	4—? calibre (light) (? H.A./L.A.).	A.2	B.3	No. and Position 1942, Calibre 1940 or earlier.
13	095° Cape S. VITO, 2,330 yards. There are five occupied emplacements but it is believed that one is a control post. Zero line 228°.	4—? calibre (light) (? H.A./L.A.).	A.2	—	1942
14	C. de GREGORIO, 70° Cape S. VITO, 1,400 yards, on the coast, guns mounted on a concrete or earthwork platform, surrounded by ditch. Zero line 225°.	4—8-in. or 11-in. Hows.	Position A.2 No. B.3	B.3	Position 1942, No. and Calibre 1940 or earlier.
15	Cape S. VITO: guns mounted in line, the command post is behind the two centre guns; there is a trench from the East side of the battery down to the water. The ammunition store (100 ft. by 25 ft., protected on three sides by a high earth bank) is on the coast, 345°, 630 yards from the battery. Zero line 175°.	4—4.7-in. or 6-in.	A.2	B.3	Position and No. 1942, Calibre 1940 or earlier.
16	017° Cape S. VITO, 1,760 yards. Zero line 290°.	4—? calibre	A.2	—	1942
17	250° DIGA di S. VITO, 235 yards. Zero line 255°. There is a com-	4—? calibre	A.2	—	1942

		6-7-4-7-in. or 6-in. (? H.A./L.A.).			
10	100° LE MACCHIE Point: 1,130 yards. Battery in a "V"-shaped layout. The command post is in the centre of the Battery behind the guns. There is a sunken magazine between the battery and the shore. There is a trench, 330 yards long, running West from the battery to the shore. Zero lines (point of reference gun at base of "V"): 4 guns 270°, 3 guns 155°.	?	A.2	—	1942
11	LE MACCHIE Point: guns mounted on a concrete platform behind an earth or concrete bank: the whole position is wired round. Zero line 195°.	4-? calibre (light) (? H.A./L.A.).	A.2	B.3	No. and Position 1942, Calibre 1940 or earlier.
12	113° Cape S. VITO, 2,760 yards: guns mounted in an irregular line on the coast. There are five occupied emplacements but it is believed that one is a control post. Crew billeted in huts behind the battery. Zero line 190°.	4-? calibre (light) (? H.A./L.A.).	A.2	—	1942
13	095° Cape S. VITO, 2,330 yards. There are five occupied emplacements but it is believed that one is a control post. Zero line 228°.	4-8-in. or 11-in. Hows.	Position A.2 No. B.3	B.3	Position 1942, No. and Calibre 1940 or earlier.
14	C. de GREGORIO, 70° Cape S. VITO, 1,400 yards, on the coast, guns mounted on a concrete or earthwork platform, surrounded by ditch. Zero line 225°.	4-4-7-in. or 6-in.	A.2	B.3	Position and No. 1942, Calibre 1940 or earlier.
15	Cape S. VITO: guns mounted in line, the command post is behind the two centre guns: there is a trench from the East side of the battery down to the water. The ammunition store (100 ft. by 25 ft., protected on three sides by a high earth bank) is on the coast, 345° 630 yards from the battery. Zero line 175°.	4-? calibre	A.2	—	1942
16	017° Cape S. VITO, 1,760 yards. Zero line 290°.	4-? calibre	A.2	—	1942
17	250° DIGA di S. VITO, 235 yards. Zero line 255°. There is a command post between Batteries 18 and 19, and a small ammunition store behind the command post.	4-? calibre (? H.A./L.A.).	A.2	—	1942
18	040° DIGA di TARANTOLA, 630 yards. Guns mounted in a staggered line along the coast: the command post is situated behind the two centre guns. Zero line 285°.	3-? calibre (not heavier than 4-5-in.). ?(H.A./L.A.).	A.2	A.2	1942
19	142° Fort S. ANGELO, 2,900 yards, sited on a headland. Zero line 230°.	4-4-7-in. or 4-in	A.2	A.2	1942
20	ARCHITA: 130° Fort S. ANGELO, 1,620 yards. Guns mounted on a concrete or earth work platform surrounded by a ditch. Zero line 245°.	4-4-7-in. or 4-in	Position A.2 No. B.3	B.3	Position 1942, No. and Calibre 1940 or earlier.

Observation Posts

(a) A tall square tower, situated to the South-East of the CATANZARO road bridge over the BARI railway line, 31° RONDINELLA Point, 1,930 yards.

(b) A square tower on RONDINELLA Point.

(g) Ammunition Dumps and Magazines

(i) At BUFFOLUTO, North of the East Basin of the MAR PICCOLO, there is a large ammunition dump which has a water frontage extending from the East side of PENNA Point around to BUFFOLUTO for approximately 1½ miles, and extends inland for 1,460 yards.

The dump can be divided into four groups as follows:—

(a) The underground storage on the East side of PENNA Point. This is composed of 11 underground stores recessed into the cliff face, each linked by railway. Dense vegetation on top.

On the quayside in front of these are three double "V" roofed sheds with overhanging eaves on one side to shelter rolling stock. Their dimensions are two buildings, 195 ft. by 110 ft., and one 270 ft. by 110 ft. This dump possesses an "L" shaped jetty, 430 ft. long, at which train ferries have been seen secured.

(b) Approximately 320 yards North-East of (a) there is a walled enclosure covering approximately 55 acres which can be divided into three sections:—

West Section, in which there are eight sheds, 160 ft. by 40 ft., and a group of four sheds, 25 ft. square, all protected by anti-blast walls.

Centre Section, three sheds, 150 ft. by 30 ft., with overhanging eaves, four sheds, 150 ft. by 55 ft., one shed, 85 ft. by 55 ft., and three groups of four sheds, 25 ft. square.

Outside the enclosure on the North side is one shed, 55 ft. by 40 ft., protected by anti-blast walls, and a number of subsidiary buildings.

Eastern Section, one shed, 95 ft. by 55 ft., two buried stores estimated at 75 ft. by 55 ft., two sheds, 55 ft. by 30 ft., four sheds, 35 ft. by 20 ft., and one shed, 15 ft. square; all are protected by anti-blast walls.

(c) Approximately 865 yards East of (b) there is another walled enclosure covering approximately 145 acres, in which are the following stores linked by railway:—

Two sheds, 125 ft. by 45 ft., with overhanging eaves; one group of four sheds, 55 ft. by 35 ft., and 21 groups of four sheds, 35 ft. by 30 ft., with overhanging eaves; all protected by anti-blast walls.

Six sheds, 145 ft. by 45 ft., three sheds, 130 ft. by 35 ft., 14 sheds, 110 ft. by 45 ft., and two sheds, 23 ft. by 20 ft. All these have overhanging eaves but are unprotected by anti-blast walls.

There are five fire pools in the enclosure. Outside the enclosure to the East are five more storage sheds, the dimensions of which are:—

One triple arched roof building, 600 ft. by 65 ft.

One triple arched roof building, 590 ft. by 65 ft.

Two triple arched roof buildings, 250 ft. by 75 ft.

All the above have overhanging eaves and rail communication, but are unprotected by anti-blast walls.

One shed, 85 ft. by 45 ft., with overhanging eaves and protected by anti-blast walls.

(d) Along the foreshore, between enclosures (b) and (c), are many buildings of varying types and a number of sheds protected by anti-blast walls, the dimensions of the latter are as follows:—

North of the quayside, two sheds, 45 ft. by 25 ft., two sheds, 33 ft. by 25 ft., one shed, 25 ft. by 20 ft., one shed, 45 ft. by 20 ft., two sheds, 33 ft. by 20 ft., and

(b) Approximately 320 yards North-East of (a) there is a walled enclosure covering approximately 55 acres which can be divided into three sections:—

West Section, in which there are eight sheds, 160 ft. by 40 ft., and a group of four sheds, 25 ft. square, all protected by anti-blast walls.

Centre Section, three sheds, 150 ft. by 30 ft., with overhanging eaves, four sheds, 150 ft. by 55 ft., one shed, 85 ft. by 55 ft., and three groups of four sheds, 25 ft. square.

Outside the enclosure on the North side is one shed, 55 ft. by 40 ft., protected by anti-blast walls, and a number of subsidiary buildings.

Eastern Section, one shed, 95 ft. by 55 ft., two buried stores estimated at 75 ft. by 55 ft., two sheds, 55 ft. by 30 ft., four sheds, 35 ft. by 20 ft., and one shed, 15 ft. square: all are protected by anti-blast walls.

(c) Approximately 865 yards East of (b) there is another walled enclosure covering approximately 145 acres, in which are the following stores linked by railway:—

Two sheds, 125 ft. by 45 ft., with overhanging eaves; one group of four sheds, 55 ft. by 35 ft., and 21 groups of four sheds, 35 ft. by 30 ft., with overhanging eaves: all protected by anti-blast walls.

Six sheds, 145 ft. by 45 ft., three sheds, 130 ft. by 35 ft., 14 sheds, 110 ft. by 45 ft., and two sheds, 23 ft. by 20 ft. All these have overhanging eaves but are unprotected by anti-blast walls.

There are five fire pools in the enclosure. Outside the enclosure to the East are five more storage sheds, the dimensions of which are:—

One triple arched roof building, 600 ft. by 65 ft.

One triple arched roof building, 590 ft. by 65 ft.

Two triple arched roof buildings, 250 ft. by 75 ft.

All the above have overhanging eaves and rail communication, but are unprotected by anti-blast walls.

One shed, 85 ft. by 45 ft., with overhanging eaves and protected by anti-blast walls.

(d) Along the foreshore, between enclosures (b) and (c), are many buildings of varying types and a number of sheds protected by anti-blast walls, the dimensions of the latter are as follows:—

North of the quayside, two sheds, 45 ft. by 25 ft., two sheds, 33 ft. by 25 ft., one shed, 25 ft. by 20 ft., one shed, 45 ft. by 20 ft., two sheds, 33 ft. by 20 ft., and one shed, 30 ft. by 20 ft.

Behind the buildings on the foreshore the railway makes a loop Northward and enters a tunnel, 450 ft. long, before rejoining the quayside. It is believed that this may be an underground store but it is not possible to estimate its size.

Along quayside from West to East:—One shed, 120 ft. by 35 ft., one shed, 110 ft. by 35 ft., one shed, 65 ft. by 45 ft., two sheds, 60 ft. by 35 ft., three sheds, 55 ft. by 45 ft., two sheds, 28 ft. by 23 ft., three sheds, 25 ft. by 20 ft., three sheds, 65 ft. by 45 ft., one shed, 55 ft. by 45 ft., one shed, 45 ft. by 40 ft., one shed, 45 ft. by 28 ft., two sheds, 40 ft. by 20 ft., and one shed, 35 ft. by 18 ft.

A smaller ammunition dump is situated approximately $4\frac{1}{2}$ miles East of the Naval Dockyard and $\frac{1}{4}$ mile North of the TARANTO-GROTTAGLIE road.

It consists of six sheds protected by anti-blast walls and 20 other sheds, connected by a circular road.

312 **TARANTO***Magazines*

- (a) 120° Coast Defence Battery No. 10, 2,100 yards: on the shore of a small bay: Magazine protected by three anti-blast walls.
- (b) Between Coast Defence Battery No. 11 and the shore, a sunken Magazine.
- (c) 200 yards North of Coast Defence Battery No. 12.
- (d) Behind Coast Defence Battery No. 5 on S. PIETRO Island.
- (e) In a wood, 320 yards North-East of RONDINELLA Point (a small store), in the vicinity of A.A. Battery No. 1. 380 yards North of the Battery at the light railway Terminus are two stores protected by anti-blast walls, and two more 100 yards South-West of the Battery.

(iii) Searchlights

- (a) RONDINELLA Point, in a small stone building. (B.3, 1940.)
- (b) S. PIETRO Island: IL POSTO, La FORCA (Battery of 3) and LO SCANNO. (B.3, 1940.)
- (c) 095° LE MACCHIE Point, 1,100 yards: a battery of five. (A.2, 1942.)
- (d) 037° Cape SAN VITO, 500 yards: a single battery. (A.2, 1942.)
- (e) To the West of Coast Defence Battery No. 17: a battery of six. (A.2, 1942.)
- (f) Massa la CATTIVA: a battery of three. (A.2, 1942.)
- (g) C. del CARMINE: 2,500 yards South-South-East of Naval Dockyard. (B.3, 1941.)
- (h) PASSAGGIO PICCOLO: one on each side. (B.3, 1940.)
- (i) 040°, PENNA Point, 800 yards: a battery of two on cliff. (A.2, 1942.)
- All searchlights are said to be used as movable beams.

*(iv) Local Seaward Defences**Submerged Breakwaters*

These Breakwaters, which are fully described in paragraph (2) PORT FACILITIES, under Description of Harbour, are part of the local Seaward Defences of the Port.

Underwater Obstructions

Underwater Obstructions (type unknown) stretch for about 1½ miles in a North-Easterly direction from BORGO Della STAZIONE, in the North-West corner of MAR PICCOLO.

Minefields

- (a) Mines (P.D.) have been reported in the Gulf of Taranto in the vicinity of Lat. 40° 12' N., Long. 17° 29' E., and also Lat. 40° 18' N., between Long. 17° and 17° 30' E.
- (b) Magnetic mines are reported at TARANTO.
- (c) There is a Mining Depot in the CASTELLO ST. ANGELO. There is also a tug for laying mines which can carry 90 at a time.

*Booms and Nets. (A.2, 1942.)**(a) MAR GRANDE*

The entrance to MAR GRANDE is protected by two booms, parallel for practically their entire length, and 500 ft. apart, which join the DIGA di SAN VITO to ISOLOTTO di SAN PAOLO.

Outer Boom

The Outer Boom, which measures 1,866 yards, is attached at its North-Western end to the East-South-East point of I. di SAN PAOLO, at its South-Eastern end to the Western end of the DIGA di SAN VITO.

- (c) 095° LE MACCHIE Point, 1,100 yards: a battery of five. (A.2, 1942.)
 - (d) 037° Cape SAN VITO, 500 yards: a single battery. (A.2, 1942.)
 - (e) To the West of Coast Defence Battery No. 17: a battery of six. (A.2, 1942.)
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The Outer Boom, which measures 1,866 yards, is attached at its North-Western end to the East-South-East point of I. di SAN PAOLO, at its South-Eastern end to the Western end of the DIGA di SAN VITO.

A gate, approximately 200 yards wide, opens in a North-North-East direction from a point approximately 350 yards from the Western end of the DIGA di SAN VITO.

Inner Boom

The Inner Boom, which measures 2,383 yards, stretches from the middle of the breakwater on the North-North-East side of I. di SAN PAOLO; from there it curves round to run parallel with the Outer Boom from the point where this is attached to the Island. A gate, approximately 200 yards wide, opens opposite the gate in the Outer Boom and has been seen turned back in either a South-Westerly or a South-Easterly direction.

The Booms are operated by vessels moored, one South-East and one North-West of the Gates.

(b) A single line boom in crescent form protects the Submarine Base. It stretches from the end of the quay East of the S/M jetty to a point 700 ft. North of the end of the S/M jetty. A second double defence line is laid Northwards from the end of the S/M jetty for a distance of 590 ft., this leaves an entrance 100 ft. wide on the West side of the area enclosed by the nets.

TARANTO 313

(c) A single line boom, 200 ft. long, lying 100-150 ft. off the entrance, protects the Principe di Napoli Dock.

(d) A "Cavour" class Battleship in floating dock is protected on the West and North sides by a double boom in the form of an inverted "L". The West section is 664 ft. long and the North section 380 ft. long. On the East side there is a separate net which is double for part of its length. An extension of 160 ft. of the West section of this boom lies parallel with, and about 200 ft. from the entrance to the New Dock. (July, 1942.)

(e) The oil fuelling jetty near PTA. PENNA is protected by a double line boom running parallel with the jetty at a distance of 450 ft. from it. Two further sections of double nets connect from each end to the corresponding end of the jetty, the whole forming a trapezium.

Apart from these more or less permanent defences there are four double rectangular booms anchored in the Mar Grande for the protection of major Naval units.

A/S Nets

The gap in the submerged breakwater which joins I. SAN PIETRO with RONDINELLA Point is protected by double A/S nets.

The profusion of nets which are always to be seen off the North shores of the MAR PICCOLO and off the South shore on both sides of the Seaplane Base are not of military significance although they do constitute a barrier; they are the oyster beds for which TARANTO is famous. These nets extend from the shore to an average width of 2,000 ft.

Submarine Listening Post

There is an anti-submarine Listening Post at GALLIPOLI on the Eastern side of the Gulf of TARANTO. (B.I., 1942.)

(v) Local Air Defences

(a) A.A. Batteries

Battery No.	Location and Description.	Armament.	Grading.	Date of Latest Report.
1	053° RONDINELLA Point, 880 yards, mounted on a concrete platform behind a concrete or earthwork bank: a large quantity of ammunition brought up by a light railway from RONDINELLA Point is stored in the vicinity of the battery. Zero line 230°.	?-? calibre	A.2	1942
2	1,250 yards East of PUNTA RONDINELLA.	?-? 3 in.	B.3	1940 or earlier.
3	305° Power Station, approximately 475 yards.	3-? calibre (up to 2-in.)	A.2	1942
4	Immediately East of A.A. Battery 3. The crews for guns mounted in a line. The crews for Batteries 3 and 4 are housed in two huts between the batteries.	4-? calibre (3-in. to 6-in.)	A.2	1942
5	040° Main Railway Station, 930 yards, guns sited on an embankment between road and railway.	3-? calibre (up to 2-in.)	A.2	1942
6	280° TOSI'S shipbuilding yard, 1,200 yards, guns mounted in arc are on top of the cliff: this is believed to be a permanent position, with a brick building nearby for personnel.	6-? calibre (3-in. to 6-in.)	A.2	1942
7	For the local defence of A.A.5, sited on an embankment between the shore and the battery.	2-? calibre (up to 2-in.)	A.2	1942

Submarine Listening Post
There is an anti-submarine Listening Post at GALLIPOLI on the Eastern side of the Gulf of TARANTO. (B.I. 1942.)

(v) *Local Air Defences*
(a) *A.A. Batteries*

Battery No.	Location and Description.	Armament.	Grading.	Date of Latest Report.
1	053° RONDINELLA Point, 880 yards, mounted on a concrete platform behind a concrete or earthwork bank: a large quantity of ammunition brought up by a light railway from RONDINELLA Point is stored in the vicinity of the battery. Zero line 230°.	?-? calibre	A.2	1942
2	1,250 yards East of PUNTA RONDINELLA.	?-? 3 in.	B.3	1940 or earlier.
3	305° Power Station, approximately 475 yards.	3-? calibre (up to 2-in.)	A.2	1942
4	Immediately East of A.A. Battery 3, guns mounted in a line. The crews for Batteries 3 and 4 are housed in two huts between the batteries.	4-? calibre (3-in. to 6-in.)	A.2	1942
5	040° Main Railway Station, 930 yards, guns sited on an embankment between road and railway.	3-? calibre (up to 2-in.)	A.2	1942
6	260° TOSI'S shipbuilding yard, 1,200 yards, guns mounted in arc on top of the cliff: this is believed to be a permanent position, with a brick building nearby for personnel. For the local defence of A.A.6, sited on an embankment between the shore and the battery.	6-? calibre (3-in. to 6-in.)	A.2	1942
7		2-? calibre (up to 2-in.)	A.2	1942
8	PENNA POINT: guns mounted in a "V"-shaped layout, sited on the cliff at the base of the oil discharge jetty.	6-? calibre (3-in. to 6-in.)	A.2	1942
9	West side of ammunition dump at BUF-FOLUTO: heavy guns in trapezoidal layout, with the light guns irregularly spaced: the fire from both batteries appears to be controlled from a central command post.	4-? calibre (3-in. to 6-in.) 3-? calibre (up to 2-in.)	A.2	1942
10	Lat. 40° 28' 30" N., Long. 17° 22' 20" E., guns mounted in an arc.	4-? calibre (3-in. to 6-in.)	A.2	1942
11	180° Oil Discharge Jetty at I FRONTE, 2,200 yards; guns mounted in trapezoidal layout. Two small ammunition stores protected by banks of earth to the North of the battery: the crew is billeted in C. PANTALEO Farm close by.	4-? calibre (3-in. to 6-in.)	A.2	1942

PICCOLO and off the South shore on both sides of the barrier: they are the oyster beds for which significance although they do constitute a barrier: they are the oyster beds for which TARANTO is famous. These nets extend from the shore to an average width of 2,000 ft.

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A.A. Batteries—continued.

Battery No.	Location and Description.	Armament.	Grading.	Date of Latest Report.
12	240° Seaplane Station, 420 yards. The command post is situated off the centre of the layout, and a close group of three small emplacements in line with the guns probably contains fire-control equipment. The crew is billeted in a small group of huts to the West of the battery.	4—? calibre (3-in. to 6-in.).	A.2	1942
13	225° Seaplane Station, 920 yards. Battery under construction, of which 3 guns are in position.	3 or more—? calibre (3-in. to 6-in.).	A.2	1942
14	210° Seaplane Station, 1,430 yards. Guns mounted in an arc; approximately 45 yards in front of the battery are two emplacements which may be either for prediction apparatus or for light A.A.	6—? calibre (3-in. to 6-in.).	A.2	1942
15	Naval Dockyard, guns mounted in line along the North side of the Stadium.	4—? calibre (up to 2-in.).	A.2	1942
16	Submarine Base	?—? 3-in.	B.3	1940
17	Torpedo Boat and Destroyer Station ..	?—? 3-in.	B.3	1940
18	Corso VITTO EMANUELE, Health Office Male.	?—? 3-in.	B.3	1940
19	Corso VITTO EMANUELE	?—? 3-in.	B.3	1940
20	Castell SAN ANGELO	4—3-in.	B.3	1940
21	Governor's Palace	?—? 3-in.	B.3	1940
22	ARCHITA	?—? 3-in.	B.3	1940
23	180° PRINCIPE di NAPOLI, 1,320 yards; mounted in hexagonal layout.	6—? calibre (3-in. to 6-in.).	A.2	1942
24	C. BEAUMONT	?—? 3-in.	B.3	1940
25	075° DIGA di S. VITO, 915 yards; guns mounted in a line along the coast, close to a stores dump and jetty. Zero line 340°.	3—? calibre (light) (? H.A./L.A.).	A.2	1942
26	East side of C. GIURA Farm; battery under construction, emplacements in a line; a path linking each emplacement to a hut 60 yards to the South-West is in preparation. This battery is on the site of a former 4-gun battery which has been removed.	6—? calibre	A.2	1942
27	North-West of MASSA La CATTIVA ..	?—? 3-in.	B.3	1940
28	MASSA La CATTIVA	?—? 3-in.	B.3	1940
29	South of C.D. Battery 16	2—? calibre (up to 2-in.).	A.2	1942
30	110° Cape S. VITO, 4½ miles, between C.D. Battery 10 and the shore, probably mobile.	1—? calibre (up to 2-in.).	A.2	1942
31	S. PIETRO Island; 100° LO SCANNO, 740 yards; mounted on a concrete or earthwork platform, behind a bank surrounded by a ditch. Zero line 230°.	?—? calibre	A.2	1942

(b) Floating A.A. Defences

Vessels fitted with A.A. guns are reported to be specially moored as part of the A.A. defences, in the following positions:—

(1) Three destroyers along the Southern Breakwater on the Western side.

	6-in.).				
15	Guns mounted in an arc; approximately 45 yards in front of the battery are two emplacements which may be either for prediction apparatus or for light A.A.				
16	Naval Dockyard, guns mounted in line along the North side of the Stadium.				
17	Submarine Base	4—? calibre (up to 2-in.)	A.2	1942	
18	Torpedo Boat and Destroyer Station ..	?—? 3-in.	B.3	1940	
19	Corso VITTO EMANUELE, Health Office Mole.	?—? 3-in.	B.3	1940	
20	Corso VITTO EMANUELE	?—? 3-in.	B.3	1940	
21	Castell SAN ANGELO	?—? 3-in.	B.3	1940	
22	Governor's Palace	?—? 3-in.	B.3	1940	
23	ARCHITA	?—? 3-in.	B.3	1940	
24	180° PRINCIPE di NAPOLI, 1,320 yards; mounted in hexagonal layout.	6—? calibre (3-in. to 6-in.)	A.2	1942	
25	C. BEAUMONT	?—? 3-in.	B.3	1940	
26	075° DIGA di S. VITO, 915 yards; guns mounted in a line along the coast, close to a stores dump and jetty. Zero line 340°.	3—? calibre (light) (? H.A./L.A.)	A.2	1942	
27	East side of C. GIURA Farm; battery under construction, emplacements in a line; a path linking each emplacement to a hut 60 yards to the South-West is in preparation. This battery is on the site of a former 4-gun battery which has been removed.	6—? calibre ..	A.2	1942	
28	North-West of MASSA La CATTIVA				
29	MASSA La CATTIVA	?—? 3-in.	B.3	1940	
30	South of C.D. Battery 16	?—? 3-in.	B.3	1940	
31	110° Cape S. VITO, 4½ miles, between C.D. Battery 10 and the shore, probably mobile.	2—? calibre (up to 2-in.)	A.2	1942	
32		1—? calibre (up to 2-in.)	A.2	1942	
33	S. PIETRO Island; 100° LO SCANNO, 740 yards; mounted on a concrete or earthwork platform, behind a bank surrounded by a ditch. Zero line 230°.	?—? calibre ..	A.2	1942	

(b) *Floating A.A. Defences*

Vessels fitted with A.A. guns are reported to be specially moored as part of the A.A. defences, in the following positions:—

- (i) Three destroyers along the Southern Breakwater on the Western side.
- (ii) One M.V. off the entrance to the Commercial Port.
- (iii) Two M.V.s about 6 cables South of RONDINELLA Point to the Eastward of the submerged Barrier.
- (iv) Two M.V.s in the entrance to MAR GRANDE, between SAN PAOLO Island and the end of the submerged breakwater

Smoke Screen

When a warning sounds a smoke screen is released as part of the A.A. defence scheme.

Balloon Barrage

The position of the Balloon Barrage is variable, as a large proportion of the Balloons is flown from barges which move about in the harbour.

Balloons are to be expected:—

- (a) Along the East shore of the MAR GRANDE from the DIGA di TARANTOLA (submerged breakwater) to the CANALE NAVIGABILE.
- (b) From barges above the DIGA di TARANTOLA.
- (c) In the Naval Dockyard protecting Naval Units.

Notes on the Efficiency of A.A. Defences

In June, 1942, A.A. fire was progressively described as "spasmodic and inaccurate (Heavy)"; "A.A. medium barrage light and heavy ineffective"; "rather more heavy A.A. than on previous raids, but quite inaccurate, a certain amount of light A.A. hose-piping"; smoke screen—"continuous and covered a wide area, whole dock area and half of MAR GRANDE being hidden"; "Very effective over target area" and "fairly effective". A.A. Searchlights: "about 12, one aircraft illuminated but not held".

(13) Reconnaissance

Although the coastline is low lying only in one place, North of RONDINELLA POINT there is a beach suitable for landing, the coastline to the South-East of CAPE SAN VITO being rocky.

Approximately 2,800 yards 349° from RONDINELLA POINT a good beach, unprotected by wire or other obstacles, extends North-West for 1,150 yards as far as is known with an average width of 40 yards; behind it there are low sand dunes.

The water off shore appears to be very shallow for a distance of approximately 115 yards. A good road, 10/15 ft. wide, from the TARANTO-CATANZARO road, runs in a North-Westerly direction behind the beach to a small river where it deteriorates.

The CATANZARO railway and road run parallel to the beach in this Section at a distance of 200 yards, and 300 yards respectively.

Between the beach and railway is an area of reclaimed river bed which is divided by irrigation channels, but these are neither very deep nor wide and would present no great obstacle. Beyond the railway, which is embanked at this point, the land is flat and well planted with trees.

TRIESTE

(See Plans 40, 41, 42, 43 and 44)

(1) General

TRIESTE was the principal Seaport of the former state of AUSTRIA-HUNGARY, but subsequently became Italian as a result of the war 1914-1918. Under Italian ownership it is gradually regaining its former importance.

It ranks third after GENOA and VENICE with imports, and second only to GENOA in exports.

It is the largest passenger Port in ITALY.

There are extensive Docking and Shipbuilding facilities.

It is a Terminal Port for the following shipping lines:—Lloyd Triestino, Consulich, Navigazione Libera Triestino, etc., and had world-wide cargo and passenger connections.

It is connected by rail with all parts of ITALY, AUSTRIA, HUNGARY, CZECHOSLOVAKIA, YUGOSLAVIA, and CENTRAL EUROPE generally.

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(2) Port Facilities

See Plan 41 and Sailing Directions.

Docks**(a) Graving Docks:**

		Overall Length.	Width of Entrance at Top.	Depth at Sill.
No. 1 ..	..	ft. 456	ft. 73	ft. in. 21 0
No. 2 ..	..	362	67	23 2
SAN ROCCO		Length on Bottom. 394 ft.	Width on Bottom. 60 ft.	Depth on Blocks. 21 ft.
No. 3 ..	..	Extreme Length. 414 ft.		25 ft.

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(b) Floating Docks. (MONFALCONE Yard.)

	Overall Length.	Inside Width at Entrance.	Width at Top.	Depth at Blocks.	Lift in Tons.
No. 1	ft. 541	ft. in. 67 0	ft. 91	ft. 21	13,000
No. 2	229	55 8	?	21	2,000
No. 3	172	(clear)	—	?	1,300
SAN MARCO					
No. 22	Extreme Length. 584	Length on Blocks. 538	Width at Top. 118	Clear Width. 110	Depth on Blocks. 35
		ft. 94	ft. 118	ft. 7	ft. 39
					ft. 6
					ft. 21,500
(Brought from POLA in 1938 and believed to be still at TRIESTE.)					

In 1939 there was a project to build a Dock of about 803 ft. in length, in the SAN MARCO Yard, to take the largest type of Battleship. It was expected to take 3 years to complete. No later details are available.

(3) The Town

See Plan 41 and Sailing Directions.

(4) Government Establishments

Barracks

GORIZIA.—There are some large Barracks just outside GORIZIA (on the SAVOGNA Road). These Barracks are each divided into three sections, one being for Artillery and the other two for Infantry. The latter are named CASERMA AOSTA and CASERMA SAVOIA. It is estimated that the normal capacity of each section would be about one battalion of, say, 700–800 men. The Parade Ground in front of the Artillery section contains several covered guns of various calibres. These Barracks occupy a total road frontage of over 200 yards.

New Barracks of an extensive nature capable of accommodating about 2,000 have been constructed in the valley between hill 1490 and BIANNE. They are called CASERMA MONTE CIMONE.

GORIZIA-PREVALLO.—There is a fairly large CASERMA MILITARE near AIDUS-SINA, and a smaller one at VIPACCO, capacity not known.

MIRAMAR Castle.—South-Eastwards along the coast from the castle there is a stretch of wooden buildings which extends for about 1 mile. These are used as barracks for Italian troops. Amongst these buildings there are a number of square concrete towers, the purpose of which is not known.

Molo del SANITA.—The buildings on this Mole are used as barracks for German soldiers.

(5) Commercial Establishments. (See also Section V (2).)

THE MONFALCONE YARD (*Cantieri Riuniti dell'Adriatico*)

This Yard is situated about 13½ miles West of TRIESTE. There are eight Slips, details of which are given in Section V (2).

There are three Floating Docks with capacities of 12,500, 3,500 and 1,000 tons. The largest Crane will lift 100 tons. Ships are built very quickly at MONFALCONE; a cargo vessel for SWEDEN was launched in six months and expected to be completed in a year. The Yard has recently specialised on its commercial side in the construction of Motor Ships. On the Naval side, small Cruisers, Destroyers and Sloopers have been built.

In 1939 there was a project to build a Dock of about 803 ft. in length, in the SAN MARCO Yard, to take the largest type of Battleship. It was expected to take 3 years to complete. No later details are available.

(3) The Town

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GORIZIA-PREVALLO.—There is a fairly large CASERMA MILITARE near AIDUS-SINA, and a smaller one at VIPACCO, capacity not known.

MIRAMAR Castle.—South-Eastwards along the coast from the castle there is a stretch of wooden buildings which extends for about 1 mile. These are used as barracks for Italian troops. Amongst these buildings there are a number of square concrete towers, the purpose of which is not known.

Molo del SANITA.—The buildings on this Mole are used as barracks for German soldiers.

(5) Commercial Establishments. (See also Section V (2).)

THE MONFALCONE YARD (*Cantieri Riuniti dell'Adriatico*)

This Yard is situated about 13½ miles West of TRIESTE. There are eight Slips, details of which are given in Section V (2).

There are three Floating Docks with capacities of 12,500, 3,500 and 1,000 tons. The largest Crane will lift 100 tons. Ships are built very quickly at MONFALCONE: a cargo vessel for SWEDEN was launched in six months and expected to be completed in a year. The Yard has recently specialised on its commercial side in the construction of Motor Ships. On the Naval side, small Cruisers, Destroyers and Sloops have been built, but the chief output has been in Submarines. About 7,000 men are employed.

The Fitters' Shop is noticeably well equipped with the most modern machinery, mainly of Italian manufacture, and gives the impression of being constantly kept up to date in this respect. The Plating Shop is large and modern with excellent machinery.

SAN MARCO Yard (*Cantieri Riuniti dell'Adriatico*)

Situated on the North side of MUGGIA Bay. It is one of the most important Building Yards in ITALY and all classes of war vessels can be built. Details of Building Slips are given in Section V (2).

SAN ROCCO Yard (*Cantieri Riuniti dell'Adriatico*)

Situated on the South side of MUGGIA Bay. No building has taken place for some time and the Yard is at present employed solely on refitting work for the Lloyd Triestino and associated lines, but it is believed that building will shortly recommence (January, 1939). Details of Building Slips and Docking Facilities are given in Section V (2).

TRIESTE 317

SAN ANDREA ENGINEERING WORK (*Cantieri Riuniti dell'Adriatico*)

The main function of the Works is the manufacture of all propelling machinery—both steam and Diesel—for all vessels under construction, for which the equipment is admirable.

The main erecting and test shop is large and well fitted, and can deal with Diesel engines up to any size.

Other sections of the Establishment include a large Foundry where iron castings up to 45 tons and non-ferrous castings are dealt with; no castings of these materials which are required for the work in hand are ever ordered from outside. 2,200 men are employed.

THE SERVOLA SMELTING WORKS

These works are the property of the ILVA Combine.

Fuel Storage

The Petroleum Harbour is situated at S. SABBA on the North East side of MUGLIA Bay. There are about 15 Oil Tanks from 1,000 to 6,000 tons capacity each.

Oil Refineries

(a) The "Aquila" Refinery is sited on the East side of the Bay of MUGLIA, at ZAULE. This is the first Italian Refinery to export oil. The output is over 300,000 tons annually. There are 40 Tanks of varying sizes, with a storage capacity of 106,000 tons.

An Oiling Pier, about 100 yards long, runs out in a West-North-West direction; vessels secure beam-on to its extremity.

(b) The S.I.A.P. Refinery is at S. SABBA and has an annual output of 100,000 tons per annum and a storage capacity of 60,000 tons.

(6) Aircraft Factories

The CANTIERI RIUNITI DELL'ADRIATICO (C.R.D.A.) have a large Factory. The only type built is the Z.1007 machine and the maximum monthly output is 12: 4,000 men are employed.

The Works Aerodrome, with a Hangar measuring approximately 150 ft. by 30 ft., is situated in a position immediately to the North of the Main Road from RONCHI to CERVIGNANO, distant 1½ miles from the centre of RONCHI.

(7) Air Facilities

S.I.S.A. Seaplane Station

A new Naval Flying Boat Station has been constructed on the site of the Warehouse situated immediately to the North of the entrance to S. GIORGIO Basin. Hangars have been constructed to accommodate nine flying boats. The Station appears to be under Air Force Control.

Two new Hangars have been erected at this Station, making three in all.

The Factory Seaplane Station of the MONFALCONE Works referred to in paragraph (6) above has a large well sheltered alighting area. There are three Hangars and three Slipways and new Hangars are at present being built near to the existing ones.

(8) War Material Factories

It is clearly evident that the commercial enterprises mentioned in paragraph 5 could be converted and utilised in many directions for the production of war material.

(9) Power Plants

A large electrical Transformer Station exists about ¼ mile North of the obelisk at OPICINA. Three lines of pylons lead into the Station from a North-West direction and from TRIESTE lines lead in from various points.

There are about 15 Oil Tanks from 1,000 to 5,000 tons capacity each.

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Power is brought in through the OPICINA Station from a Hydro-Generating Station in the mountains near the coast. It is believed to be at SORIZIA.

(10) Transport Facilities

Water

Lloyd Triestino Cosulich and San Marco are the principal Italian lines using this Port. The Yugo-Slavian Line—Dubrovacka-Parobrodska call at TRIESTE on the VENICE-KOTOR run.

Air

S.I.S.A. line. Daily route services are as follows:—

PORTO ROSE-TRIESTE-BRIONI-LUSSIN PICCOLO-ZARA.

PORTO ROSE-TRIESTE-VENICE-PAVIA-GENOA.

Roads

The Main Roads leading out of TRIESTE are in excellent condition. They are well laid out, correctly cambered and have good surface.

(11) Signal Communications

There is an excellent Telephone System which connects up the Town with the outlying districts.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

- Battery No. 1. PUNTA PRIMERA (near MONFALCONE) : Three guns of 3-in. calibre ; crew 24.
 Battery No. 2. PUNTA SDOBA : Three guns of 3-in. calibre ; crew 30.
 Battery No. 3. DUINO : Three guns of 3-in. calibre ; crew 20.
 Battery No. 4. SISTIANA : Two guns of 3-in. calibre ; crew 16.
 Battery No. 5. AURISINA : Three guns of 3-in. calibre ; crew 24.
 Battery No. 6. SAN ANDREA : Three guns of 3-in. calibre ; crew 25.
 Battery No. 7. BASSOVIZZA : Four guns of 6-in. calibre ; crew 40.
 Battery No. 8. ZAULE : (?) guns of 5.1-in. calibre and (?) Howitzers of 6-in. calibre.
 Battery No. 9. PUNTA GROSSA : Three guns of 3-in. calibre ; crew 24.
 Battery No. 10. SAN LORENZO : Three guns of 3-in. calibre ; crew 20.
 Battery No. 11. CITTANOVA (near the Village of CARPIGNANO) : Three guns of 3-in. calibre.
 Battery No. 12. PARENZO (Ile S. NICOLO) : Three guns of 3.9-in. calibre.
 Battery No. 13. VALLE SAN MARTINO : Six guns of 3-in. calibre ; crew 80.

(iv) Local Seaward Defences

A/S Boom Defences

A/S Booms are placed between TIMBER WHARF Pier and Molo VII, and between MOLO AUDACE and the end of the Breakwater.

When not in use, the Boom is stored at the Harbour Offices near PONTE VERDE.

(v) Local Air Defences

A.A. Batteries

- A.A. Battery No. 1. SAN GIOVANNI. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 2. CONTOVELLO. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 3. BIANNE. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 4. MUGGIA-PROSECCO. Twenty emplacements in a line from MUGGIA to PROSECCO.
 A.A. Battery No. 5. SCORCOLA. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 6. MOLO S. THERESA. Three A.A. guns of 3-in. calibre.
 A.A. Battery No. 6A. SATURNIA House, mounted on the roof : ? four 2-in. (or less). (C.2, 1942.)
 A.A. Battery No. 6B. SÜDBAHNHOF Railway Station, mounted on the roof : ? four 2-in. (or less). (C.2, 1942.)
 A.A. Battery No. 6C. Castello GIUSTE, mounted on the walls : ? four 2-in. (or less). (C.2, 1942.)
 A.A. Battery No. 7. PUNTA S. ANDREA. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 8. SERVOLA. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 9. SAN ROCCO. Four A.A. guns of 3-in. calibre.
 A.A. Battery No. 10. VITTORIA EMANUELE Breakwater. Four A.A. guns of 3-in. calibre.

Battery No. 7. *BASSOVIZZA*: Four guns of 6-in. calibre; crew 40.
 Battery No. 8. *ZAULE*: (?) guns of 5.1-in. calibre and (?) Howitzers of 6-in. calibre.
 Battery No. 9. *PUNTA GROSSA*: Three guns of 3-in. calibre; crew 24.
 Battery No. 10. *SAN LORENZO*: Three guns of 3-in. calibre; crew 20.
 Battery No. 11. *CITTANOVA* (near the *Village of CARPIGNANO*): Three guns of 3-in. calibre.
 Battery No. 12. *PARENZO (Ile S. NICOLO)*: Three guns of 3.9-in. calibre.
 Battery No. 13. *VALLE SAN MARTINO*: Six guns of 3-in. calibre; crew 80.

(iv) *Local Seaward Defences*

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(v) *Local Air Defences*

A.A. Batteries

A.A. Battery No. 1. *SAN GIOVANNI*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 2. *CONTOVELLO*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 3. *BANNE*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 4. *MUGGIA-PROSECCO*. Twenty emplacements in a line from *MUGGIA* to *PROSECCO*.
A.A. Battery No. 5. *SCORCOLA*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 6. *MOLO S. THERESA*. Three A.A. guns of 3-in. calibre.
A.A. Battery No. 6A. *SATURNIA House*, mounted on the roof: ? four 2-in. (or less). (C.2, 1942.)
A.A. Battery No. 6B. *SÜDBAHNHOF* Railway Station, mounted on the roof: ? four 2-in. (or less). (C.2, 1942.)
A.A. Battery No. 6C. *Castello GIUSTE*, mounted on the walls: ? four 2-in. (or less). (C.2, 1942.)
A.A. Battery No. 7. *PUNTA S. ANDREA*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 8. *SERVOLA*. Four A.A. guns of 3-in. calibre.
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A.A. Battery No. 10. *VITTORIA EMANUELE Breakwater*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 11. *PUNTA SOTTILE*. Six A.A. guns of 3-in. calibre.
A.A. Battery No. 12. *PUNTA GROSSE*. Four A.A. guns of 3-in. calibre.
A.A. Battery No. 13. *SALVORE*. (?) Twelve A.A. guns of 3-in. calibre.

Mobile A.A. Batteries

On the stretch of coast between *PROSECCO* and *SISTINIA*, the new Coastal Road follows the coast and a Mobile Force with guns mounted on lorries is intended to give effective protection.

Fortifications on the Italian-Yugo-Slav Frontier

The present frontier fortifications are in good order. There are Barracks all along the Italian-Yugo-Slav Frontier, from *FIUME* right up to *TARVISIO* (the Austro-Italian-Yugo-Slav border): there are also Dug-outs, communication trenches, etc.

(13) Reconnaissance*Possible Objectives**The Dockyards. (See Plan 41.)**Water Supply. (See Plan 44.)*

The principal supply comes from the Waterworks at AURISINA. The springs from which the water is obtained are beneath the sea within a small camber at AURISINA. Near this camber are the pumps which force the water to the filters and Water Tower on the hills above. The water is conveyed to TRIESTE by two Pipe-lines, one of which is laid under the rails of the MONFALCONE-TRIESTE Railway. The destruction of any of the Railway Bridges on this line would also break this Pipe-line. The other Pipe-line runs along the hills about 600 ft. above and parallel to the Railway as far as BARCOLA. On the heights above GRETTA, in the Northern Part of the Town, is a Reservoir into which these Pipe-lines discharge. From this Reservoir three Conduits are led, one to the lower part and one to the upper part of the Town, and one to a Reservoir near the OPCINA Obelisk. The water is pumped to this Reservoir by pumps at GRETTA and supplies OPCINA and the neighbouring Villages, including PROSECCO and CONTOVELLO to the North-Westward, and TREBIC and BASSOVICA to the South-Eastward. The Pipe-line for this purpose is laid along or near the Main Road connecting these Villages.

Other Villages are supplied by a Conduit laid along the Railway from a Reservoir at OBERLESTCHE, 14 miles Eastward of TRIESTE, to NABRESINA.

Water for industrial purposes in TRIESTE is obtained from an Aqueduct in the GUARDIELLA Quarter. It is also obtained in small quantities from the ZAULE springs, near the head of ZAULE Bay, and from several wells in this neighbourhood.

Railways. (See Plan 41.)

TRIESTE has two principal Stations, the SUDBAHNHOF, near the new Harbour, and the S. ANDREA Station, near the TERESINA Mole. These terminal Stations contain extensive sidings and would present considerable targets.

There are three normal-gauge main lines leading out of TRIESTE, as follows:—

- (i) *From the SUDBAHNHOF to MONFALCONE and GORIZIA (GORZ), OPCINA, FIUME.*—The double line, on leaving the SUDBAHNHOF, runs North-Westward over a Bridge near Basin I, then through a Tunnel and over the BARCOLA Viaduct of 20 arches to GRIGNANO. It then continues along the coast past the junction for NABRESINA to MONFALCONE, continuing thence as a single line to GORIZIA.

The Railway Station at MONFALCONE is easily visible from seaward and could be shelled from PANZANO Bay.

The second section of the line from TRIESTE to MONFALCONE is visible from seaward at several points, and is particularly vulnerable. These vulnerable points are indicated on Plan 40, as follows:—

Point A.—Arch in Railway Embankment for a Road. Difficult to see from seaward owing to Warehouses in front of it.

Point B.—Small Tunnel.

Point C.—BARCOLA Viaduct, with 20 openings, all visible from seaward.

Points I, H and E.—Bridges with five arches.

Points G, F and D.—Bridges with three arches.

Point J.—NABRESINA Viaduct, about 600 yards long, and is visible from seaward between DUINO and SISTIANA. The Western end is the most important, as here it crosses the TRIESTE-MONFALCONE Road. It has

town, and one to a Reservoir near the OFICINA. The Reservoir is supplied by pumps at GRETTA and supplies OPCINA and the neighbouring Villages, including PROSECCO and CONTOVELLO to the North-Westward, and TREBIC and BASSOVICA to the South-Eastward. The Pipe-line for this purpose is laid along or near the Main Road connecting these Villages.

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Points I, H and E.—Bridges with five arches.

Points G, F and D.—Bridges with three arches.

Point J.—NABRESINA Viaduct, about 600 yards long, and is visible from seaward between DUINO and SISTIANA. The Western end is the most important, as here it crosses the TRIESTE-MONFALCONE Road. It has the appearance of a high Embankment. In August, 1917, two British monitors, firing off Port PRIMERO, at a range of about 16,000 yards, seriously damaged the Viaduct.

Point K.—Tunnel, 650 yards long, at each end of which lines run to NABRESINA Junction. It is not visible from seaward.

Point L.—BIVIO Station.

Point M.—Two arches in the Railway Embankment through which the MONFALCONE-TRIESTE Road runs. Visible from seaward.

Point N.—Viaduct.

Points O and P.—Tunnels, 300 to 400 yards long and 500 yards apart. Visible from seaward.

Point Q.—Stone Viaduct, hidden behind a hill.

From points G to O the line runs over rocky ground close to the coast and is easily visible from seaward as far as point J and possibly beyond.

TRIESTE
VADO LIGURE, PORTO DI

(ii) *From S. ANDREA Station to OPCINA and GORIZIA.*—After leaving the Station and passing behind the EMANUELE FILIBERTO DUCA D'AOSTA Basin, the line passes under a large iron Road Bridge carrying the PASSAGGIO DI S. ANDREA Embankment. At this point a narrow-gauge line to PARENZO and emerges on to an gauge line leading to the various sidings at the Timber Yard, etc., turn off to the South-Eastward. In the Embankment there are three bridges close together, which carry the line over streets near the Gasworks. Near the latter a line to POLA turns off South-Eastwards, and the OPCINA line enters a Tunnel. From the above details it is clear that the destruction of the PASSAGGIO DI S. ANDREA Bridge would block the OPCINA line and the lines to POLA and PARENZO, while the destruction of the Bridges near the Gasworks would block the OPCINA line and the line to POLA. All these Bridges are reported to be visible from seaward on a North-Easterly bearing.

The OPCINA line, at the end of the Embankment mentioned above, enters a Tunnel 443 yards long leading to ROZZOL station (2½ miles). It then continues Eastwards and at 3¼ miles enters a Tunnel 1,400 yards long and turns Northward to GUARDIELLA Station. A mile beyond GUARDIELLA the line passes over a Viaduct about 200 yards long supported on 10 arches; then follow two Tunnels, 760 and 530 yards long, respectively, a Bridge or Viaduct about 120 yards long near TERSTENIC, visible from seaward, and at 8¼ miles a Tunnel 1,150 yards long, beyond which, at 9¼ miles, the line reaches OPCINA. Between GUARDIELLA and OPCINA there are several minor Bridges in addition to those mentioned above, and the line is in several places carried along embankments supported by masonry Piers and goes through walled cuttings.

(iii) *From S. ANDREA Station to POLA and ROVIGNO.*—This line runs alongside the OPCINA line, as described above, until near the Gasworks, where it turns off as a single line to the South-Eastward, passes under a small Road Bridge near the Hospital, and then over a large Bridge over the VIA DELL' ISTRIA, where it turns Eastward to STA. ANNA. Beyond STA. ANNA the line continues in an Easterly direction, passing first under two Road Bridges and then over several Viaducts to BORST. Of these Viaducts, the first is the most important, as it is visible and vulnerable from seaward on an Easterly bearing from outside MUGGIA Bay; it lies about 800 yards Southward of ROZZOL Station, and is about 145 yards and 60 ft. above the bottom of the valley which it spans.

(iv) *From S. ANDREA Station to ISOLA, PORTO ROSE and PARENZO.*—This is merely a narrow-gauge (0.76 metre or 30 in.) single line.

W/T Station

There is a low-power W/T Station in Lat. 45° 38' 54" N., Long. 13° 45' 29" E.

Submarine Cables

There is a cable to VENICE and also one to CORFU. A new cable to RAVENNA has recently been laid. For details as to landing places, see "Submarine Telegraph Cables, Mediterranean, Black and Red Seas" (Fleet Telegraph Chart, Folio OT).

Power Plant

The Transformer Station near OPCINA is a suitable target for indirect bombardment.

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VADO LIGURE (PORTO DI)

(Lat. 44° 16' N., Long. 8° 26' E.)

(See Plan 29 (SAVONA))

(1) General Remarks

VADO is a small port on the RIVIERA di PONENTE on the coast between the French frontier and SAVNA.

Its interest lies in its vast oil storage depôts.

Anchorage

Rada di VADO, North-Westward of Capo di VADO, affords good anchorage.

There is anchorage in depths of 10 fathoms, sand, with the belfry of the Cathedral bearing 287° and just open Southward of Forte San LORENZO.

Small vessels can anchor in depths of about 4 fathoms about a cable off-shore.

VADO LIGURE, PORTO DI 321

Conspicuous Objects

Capo di VADO has some large stone quarries in its Eastern part, which give it a whitish appearance. On its summit, at an elevation of 528 ft., stand the ruins of Forte Santo STEFANO.

Forte di VADO stands on the slope about two cables North-Westward of Capo di VADO: a cable Northward of the railway pier is the low, dark Forte San LORENZO.

Currents

In Rada di VADO the current is weak and usually sets North-Westward, with a counter current inshore. If the current sets in the opposite direction, as sometimes happens, South-Easterly winds may be expected.

In these conditions the current in the vicinity of the pier is sufficiently strong to affect vessels berthing alongside.

(2) Port Facilities

Porto di VADO extends along the coast North-Westward of Capo di VADO. From the latter a Mole extends North-Eastward, and protects from Southerly winds and sea a quay which extends about 2 cables along the coast, alongside which small vessels can lie.

Seven cables to the North-Westward, a coaling pier, with a depth of 5 fathoms alongside its head, extends about 1½ cables from the shore. Close Northward of this there is a short railway pier with a depth of 12 ft. alongside its head. Another pier, of about 1½ cables in length, extends from the shore about 2 cables further North-Westward: it has a depth of 5 fathoms alongside its head.

An oiling jetty extends 2½ cables South-Eastward from the shore on the Southern side of the TORRENTE QUILLANO. This jetty has a depth of 4½ fathoms alongside its head.

There is also another oiling jetty about one mile North-Eastward which is 2½ cables in length and has a depth of 5½ fathoms alongside its head.

Water

Water is laid on to all piers.

Mooring Buoys

There are several mooring buoys.

Harbour Craft

A water boat.

Numerous small lighters.

(5) Commercial Establishments

Oil Storage

(Note.—Distances given are to the centre of the area.)

Petrolea S.A.—Capacity 41,000 tons. Position: 004° 30', North end of Capo di VADO Pier, 4,500 yards.

S.I.A.P.—Capacity 40,000 tons. Position: 297° 30', North end of Capo di VADO Pier, 2,300 yards.

There are eight large tanks and several smaller ones. There is a pipe-line along the jetty.

N.A.F.T.A.—Capacity 37,000 tons. Position: 328°, North end of Capo di VADO Pier, 3,000 yards.

The dépôt has an ocean installation and the pipe-line runs along the jetty.

A.G.I.P.—Capacity 34,000 tons. Position: 281°, North end of Capo di VADO Pier, 1,800 yards.

There are six large tanks and several smaller ones. A pipe-line runs out to sea.

Porto di VADO extends along the coast North-Westward of Capo di VADO. From the latter a Mole extends North-Eastward, and protects from Southerly winds and sea a quay which extends about 2 cables along the coast, alongside which small vessels can lie.

Seven cables to the North-Westward, a coaling pier, with a depth of 5 fathoms alongside its head, extends about $1\frac{1}{2}$ cables from the shore. Close Northward of this there is a short railway pier with a depth of 12 ft. alongside its head. Another pier, of about $1\frac{1}{2}$ cables in length, extends from the shore about 2 cables further North-Westward: it has a depth of 5 fathoms alongside its head.

An oiling jetty extends $2\frac{1}{2}$ cables South-Eastward from the shore on the Southern side of the TORRENTE QUILLANO. This jetty has a depth of $4\frac{1}{2}$ fathoms alongside its head.

There is also another oiling jetty about one mile North-Eastward which is $2\frac{1}{2}$ cables in length and has a depth of $5\frac{1}{2}$ fathoms alongside its head.

Water

Water is laid on to all piers.

Mooring Buoys

There are several mooring buoys.

Harbour Craft

A water boat.

Numerous small lighters.

(5) Commercial Establishments

Oil Storage

(Note.—Distances given are to the centre of the area.)

Petrolea S.A.—Capacity 41,000 tons. Position: $004^{\circ} 30'$, North end of Capo di VADO Pier, 4,500 yards.

S.I.A.P.—Capacity 40,000 tons. Position: $297^{\circ} 30'$, North end of Capo di VADO Pier, 2,300 yards.

There are eight large tanks and several smaller ones. There is a pipe-line along the jetty.

N.A.F.T.A.—Capacity 37,000 tons. Position: 328° , North end of Capo di VADO Pier, 3,000 yards.

The depôt has an ocean installation and the pipe-line runs along the jetty.

A.G.I.P.—Capacity 34,000 tons. Position: 281° , North end of Capo di VADO Pier, 1,800 yards.

There are six large tanks and several smaller ones. A pipe-line runs out to sea.

(8) War Material Factories

Chemical Works

Chemical works of S.A. Azogeno per la Fabbricazione dell' Ammoniaca Sintetica e Prodotti Derivati. There is a plant for the recovery of methanol and another for production of diluted and concentrated nitric acid. Products include ammonia nitrate, calcium nitrate and ammonium sulphate.

Position: 284° , North end of Capo di VADO Pier, 2,700 yards.

Coke and Gas Works

Coking plant and gas works of Soc. di Lavorazione dei Carboni Fossili. Metallurgical coke is produced.

Position: 291° , North end of Capo di VADO Pier, 1,900 yards.

Zinc Smelting Works

Soc. di MONTEPONI. Position: 275° , North end of Capo di VADO Pier, 2,800 yards.

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VECCHIO di PIOMBINO, PORTO**

(9) Power Plants

Power, according to a report dated January, 1942, and graded B.3, is provided by a power station at SAN DALMAZZO DI TENDA, situated 270 yards North of TENDA Station and 160 yards West of a point halfway down the mountain which slopes to the ROYA. This power station is said to supply all the war material factories on the LIGURIAN coast.

(10) Transport Facilities

Roads

VADO LIGURE is on the main coast road between GENOA and the French frontier, via SAVONA, ALBENGA, IMPERIA, SAN REMO, BORDIGHERA and VENTIMIGLIA.

Railway

VADO LIGURE is on the main coastal railway which runs parallel with the coast and the coast road, as described above.

(12) Defences

The defences of VADO LIGURE are included in the defence scheme of SAVONA.

(13) Reconnaissance

See SAVONA.

VECCHIO di PIOMBINO, PORTO

(Lat. 42° 56' N., Long. 10° 33' E.)

(See Plans 28 and 28A and Admiralty Chart 158)

(1) General Remarks

The importance of PIOMBINO to the Italians lies in the fact that at this town about 250,000 tons of pig iron is smelted per annum; this represents about a quarter of the total Italian annual output of pig iron. There are three Blast Furnaces and the destruction of these would have a serious effect on the Italian Steel Industry.

(2) Port Facilities

Moles and Jetties

A mole extends about 1½ cables Eastward and North-Eastward from Punta della BATTERIA.

About 4 cables Northwards of this mole is Pontile degli ALTI FORNI, a large masonry jetty. A short arm projects Northward from about the middle forming a basin with depths of about 13 ft. in it.

Between the mole and this jetty are several small jetties.

Anchorages

There is anchorage in Rada di PORTO VECCHIO in depths of about 6 fathoms, mud: strong Southerly and South-Easterly winds cause a heavy sea in the road.

Lifting Appliances

There is a crane on the head of Pontile degli ALTI FORNI. There are numerous other cranes.

(12) Defences

The defences of VADO LIGURE are included in the defence scheme of SAVONA.

(13) Reconnaissance

See SAVONA.

VECCHIO di PIOMBINO, PORTO

(Lat. 42° 56' N., Long. 10° 33' E.)

(See Plans 2S and 28A and Admiralty Chart 158)

(1) General Remarks

The importance of PIOMBINO to the Italians lies in the fact that at this town about 250,000 tons of pig iron is smelted per annum: this represents about a quarter of the total Italian annual output of pig iron. There are three Blast Furnaces and the destruction of these would have a serious effect on the Italian Steel Industry.

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Anchorage

There is anchorage in Rada di PORTO VECCHIO in depths of about 6 fathoms, mud: strong Southerly and South-Easterly winds cause a heavy sea in the road.

Lifting Appliances

There is a crane on the head of Pontile degli ALTI FORNI.

There are numerous other cranes.

Patent Slip

There is a small patent slip.

(3) Commercial Establishments

Ilva Iron and Steel Company

The Ilva Iron and Steel Company produces, at its works at PORTO FERRAJO and at PIOMBINO, 50 per cent. of Italy's annual output of pig iron.

At PIOMBINO there are three Blast Furnaces and extensive areas of Coke Ovens, Batteries and other buildings in connection with the works. These areas are sited to the North-East of the town and for target purposes may be described as follows:

Target No. 1. Blast Furnaces and Coke Oven Batteries: centre of target area, 293°, Eastern extremity of P. della Batteria, 1,250 yards.

Target No. 2. Complementary works and buildings: centre of target area 258°, Eastern extremity of P. della Batteria, 1,258 yards.

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VENICE

(See Plans 45, 46, 47, 48, 49 and 50)

(1) General

VENICE is the Headquarters of the Commander-in-Chief, Upper ADRIATIC, and a secondary Naval Base, but the Naval Establishments have been greatly reduced. It is understood, however, that these are being maintained in an efficient state should occasion arise in the future for their full use.

In addition to its Naval interests, VENICE is the principal Commercial Port on the ADRIATIC. A large and well-equipped new Port is being slowly developed at MARGHERA, about three miles North-West of VENICE. VENICE is displacing TRIESTE in importance.

(2) Port Facilities

There are adequate facilities for general requirements. The Harbour and its approaches are comparatively shallow, and accommodation for large ships is extremely limited.

Considerable Port improvements, costing 25,000,000 lire, were to commence at the beginning of 1939.

According to current reports two new Warehouses, with a floor area of 236,500 sq. ft., are to be constructed on the disused MOLO DI PONENTE, thus increasing the present Warehousing Facilities by about a third. The remainder of the grant will be expended on discharging plant for use in connection with the new Warehouses; this will consist of ten Cranes of a capacity of three tons and one large portable Crane capable of lifting weights up to 16 tons.

Depths of Water

The depths alongside the Quays vary from 25 to 30 ft., according to the different berths. The principal Quays and their depths are as follows:—

TRIESTINO LLOYD Landing Stage	..	..	..	26 to 27 ft.
SAN BASILIO, PUNTO FRANCO, S. MARTA	..	..	..	25 to 26 ft.
MOLO DI LEVANTE and MOLO DI PONENTE	..	..	..	30 ft.
SYLOS at head of the MOLO DI LEVANTE	..	..	..	26 to 27 ft.

The new Quay (RIVA DELL' IMPERO) along the North bank of St. Mark's Basin has been extended for some 500 yards. It has a depth alongside of 33 ft. and can now accommodate at the same time several vessels up to 25,000 tons.

At Port MARGHERA the depths are as follows:—

Oil Port	..	..	..	..	25 to 26 ft.
Basin No. 1 and North Industrial Channel	..	..	..	..	28 to 29 ft.

Lifting Appliances

These will shortly be increased as indicated at the beginning of this section. The present position is as follows:—

SAN BASILIO, PUNTO FRANCO, S. MARTA.—This section of the Port is devoted principally to small liner traffic and has the following appliances:—

Twenty Cranes—lifting capacity up to six tons.

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Lifting Appliances

These will shortly be increased as indicated at the beginning of this section. The present position is as follows:—

SAN BASILIO, PUNTO FRANCO, S. MARTA.—This section of the Port is devoted principally to small liner traffic and has the following appliances:—

Twenty Cranes—lifting capacity up to six tons.
Three Electric Lifts of one ton.

Eastern Mole (MOLO DI LEVANTE):—

Twenty-five Cranes—lifting capacity up to three tons.
One Crane—lifting capacity of twenty tons.

Western Mole (MOLO DI PONENTE):—

Twenty Cranes—lifting capacity up to three tons.

At the Southern extremity of this mole there is a 30-ton Crane. The Western Quay of this mole is entirely devoted to the coal trade.

Port MARGHERA.—At the North Quay of the CANALE INDUSTRIALE the Società Italiana Coke possesses two Overhead Transporters, each capable of discharging 100 tons per hour. At the Società Vetri Cristalli there are two Overhead Transporters, each capable of discharging 50 tons per hour. At the Southern Quay the Salt and Tobacco Factory possess two Cranes of 3 tons.

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Docks

There are three Government Dry Docks as follows:—

Dock.	Extreme Length	Length on Floor.	Breadth at Entrance.	Depth of Water over Sill at H.W.O.S.T.
* (i) PRINCIPE de PIEDMONT	820' 2"	810' 4"	117' 9"	39' 3"

Dock.	Length on Top.	Length on Floor.	Width at Sill.	Depth at Sill.	Depth on Blocks/ft.
(ii) MAGGIORE	528' 0"	499'	70' 0"	29' 6"	23' 3"
(iii) MINORE	298' 9"	272'	32' 9"	19' 7"	14' 3"

* The "Vittorio Veneto" and "Conte di Savoia" have both docked here.

Harbour Craft

Tugs.—The only company owning Tugs for public purposes is that of Panfido and Co., who own the following, all of which are equipped with pumps and salvage appliances:—

Name.	R.T.	I.H.P.
"Carlo"	110	600
"Olanda"	106	400
"Rubattino"	105	400
"Dante"	79	350
"Calliope"	64	250
"Iseo"	80	350
"Titanus"	362	1,050

In addition to the foregoing there are a number of small Tugs used locally for towing Lighters, etc.

Ferry or Passenger Craft

The canal steamboats which had been in service for about forty years have been replaced by 30 new oil-burning vessels, constructed locally, each about 60 ft. in length with a passenger capacity of 130. In addition to the above, four new diesel-engined vessels for the direct service VENICE-LIDO were put into service about three years ago. Their capacity for passengers is about 250.

(3) The Town

See Plan 48.

(4) Government Establishments

Naval Dockyard (see Plan 48)

Situated at the Eastern extremity of the Island on which VENICE is built. It occupies an area of about 91 acres, of which about three acres are covered by workshops and about 28 acres by basins and canals.

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Situated at the Eastern extremity of the Island on which VENICE is built. It occupies an area of about 91 acres, of which about three acres are covered by workshops and about 28 acres by basins and canals.

The most important section is the Ordnance Establishment which employs about 300 men under the supervision of three officers of the Armi Navali. During the last twelve months a number of new machines have been installed and the general lay-out of the establishment has been reorganised. Further plans and developments are under consideration.

The Yard deals with the maintenance of the M.A.S. Flotilla and of the local defence and training forces in the command. There are two Building Sheds, which are overgrown with grass, and have not been used for a long time. Nearly all the machinery is electrically-driven, but the machines are not modern. Power is supplied from outside sources, but the Yard has its own Reserve Station consisting of five Italian-Diesel generators driving five alternators which develop a total of 2,000 h.p.

There are three Government Dry Docks, details of which are given above and in Section V (1). The largest of these can receive the 35,000-ton Battleships now building.

A Torpedo Store with a capacity of 130 torpedoes is provided. Torpedoes are sent to SPEZIA for trials.

"Marco Foscarini" Naval College

This establishment, on the South-East corner of ISOLA DI SAN'ELENA (Plan 48), was opened in October, 1937, at a cost of 3,000,000 lire. The college has accommodation for 200 students, and possesses its own parade ground, bathing beaches, etc. Entry is subject to students passing certain State standard examinations. Thirty days training at sea per year will be carried out. On completion of their studies, students will be eligible for admission to the Naval Academy, LEGHORN.

Scuola Meccanici

This Establishment trains volunteer youths for the engineering branch of the Navy, in the same way that POLA and SPEZIA undertake the training for other specialist branches.

There are now 128 youths undergoing the second year instruction and 300 first year pupils; 300 new entries are received in the autumn.

(5) Commercial Establishments

Shipbuilding, Repairing and Engineering Works.

Cantiere Poli (see Plan 46).—Shipbuilding Yard situated on the lagoon at CHIOGGIA and connected by waterways with the Rivers BRENTA, BACCHIGLIONE, ADIGE and PO. Power is supplied by a diesel motor and steam-driven motors. Vessels up to 500 ft. in length can be laid down, and there are several Slips for smaller vessels.

Cantiere Navale, Ernesto Breda (see Plan 49).—Situated at the new Port of MARGHERA. The establishment undertakes the construction only of Motor-Boats, Small Craft for local services, and Naval Tugs. There are Workshops for the breaking up of vessels, and a large oxygen manufacturing plant. 800 men are employed.

There are three Slips, which are 430 ft. long. The Eastern one has a small Travelling Electric Gantry, the other two can be served by a Steam Travelling Crane. There may be a number of other Slips but information is scanty (see Section V (2)).

Minor Establishments

Cantiere Vianello, Motti, Sartori & Co.—Small Shipbuilding and Engineering Yard. Small steamships and engines and boilers of 400 h.p. are built.

Cantiere Navale ed Officine Meccaniche di Venezia, GIUDECCA Island.—This firm was once known as the Cantieri Navali ed Acciaierie di Venezia.

The Works are situated on GIUDECCA Island between the Church "IL REDENTORE" and the Canal "RIO DI PTE LUNGO," with a Slip (no Crane Facilities) capable of taking small craft up to 120 ft., leading on to the lagoon to the South.

There are three Shops:—

- (a) Machine Shop;
- (b) Smithery (three power hammers) and Pipe Shop;
- (c) Boiler Shop, Foundry and Pattern Shop.

The equipment is mixed and in the main is antiquated though adequate. The Foundry deals with cast iron and non-ferrous metals, its working capacity in the former being 1,200 tons per annum. About 600 men are employed.

Cantiere Navale Menetto Fortunato (see Plan 49).—Small Shipbuilding Yards situated at CHIOGGIA. Hulls are constructed. The Yard has a powerful Electrical Installation.

Società Venetia di Navigazione a Vapore.—Small Repairing Establishment with eight Patent Slips for small craft.

Cantiere di Contruzione e Riparazione.—Undertakes the construction and repair of small craft and employs about 140 men.

Società Veneziana Automobili Nautiche, now known as S.I.C.A.M.—This small Yard is now amalgamated with CANTIERI

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Società Veneziana Automobili Nautiche, now known as S.I.C.A.M.—This small Yard constructs and repairs M.A.S. and motor launches. It is now amalgamated with CANTIERI CELLI.

In addition to the above, the following important Industrial Establishments also exist. The Montecatini works, Fertilizers and Chemical Products; The Glass Works; Coke and Gas Factories; Soc. An. Alluminio Italiana for the extraction and manufacture of aluminium.

The Società Ilva, which is connected with the Cantieri Navali, has a Steel Rolling Plant. Two Factories, the Rice Mill and the Soc. Anon. Stereol, have commenced the production of vegetable oils, whilst the Società St. Marco Elettrometallurgice Veneta have commenced producing iron alloys and chemical manures.

Fuel Depôts

Società Anonima Italiana Importazione Olii have two Tanks situated at the Eastern end of the GIUDECCA Island. Steamers and Industrial Establishments are supplied with fuel from these.

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Imprese Navali ed Affini (I.N.E.A.) own a Floating Tank situated at ALBERONI. The Tank is about 200 ft. in length, marked "I.N.E.A.5" and is said to have a capacity of 400 tons.

This firm also owns five Oilers, viz.: "Trotteria," "Marangona," "Nevona," "Marghera" and "Conti Di Misurata." These are mostly engaged in transporting oil from BATOUM to VENICE.

On the mainland at MARGHERA there are four Oil Importing Firms:—
The Società Italo Americana per Petrolio (S.I.A.P.), Plot No. 6 on Plan 49, which occupies a space of 119,000 square yards, adjoining the Oil Port.

The Società Nafta, occupies 234,183 square yards alongside the S.I.A.P.
 With regard to these two firms no information is available. They own together between 15 and 20 Tanks, and it is probable that the plant belonging to these two companies has been increased in later years.

The Azienda Generale Italiana Petroli (A.G.I.P.), is situated on the East and West sides of the Northern end of the BRENTELLA Canal. There are 11 Tanks of about 2,000 tons capacity (see Plot 20 on Plan 49).

On the East bank of the EAST INDUSTRIAL Canal in the Plot marked "Industrial Area" there is a large Oil Installation, consisting of four large Tanks (capacity 106,000 cubic ft.), three smaller Tanks, and seven smaller again.

The Petrolea Soc. Anon. Italiana has leased 137,265 square yards of ground on the South-East side of the BRENTELLA Canal. There are 11 large Tanks.

At the extreme South-Western end of the BRENTELLA Canal, there are two Tanks. These belong to the *Società Anonima Stereol of BRESCIA and MILAN* engaged in the hydrogenation of animal oils.

There are large Underground Petrol Tanks at RANA, a district of MARGHERA.

Oil Refinery

Azienda Generale Italiana Petroli (A.G.I.P.) occupies 291,473 square yards West of the Società Natta. The whole of the plant has been taken over by the Italian Government.

A.G.I.P. is the only Oil Refinery in this district. The combine is believed to possess some 20 Tanks, the largest having a capacity of 6,000 tons. Their Total Storage Capacity amounts to about 15,000 tons. The production of this combine has reached 100,000 tons annually.

Coal

There is a well-fitted Coaling Wharf, where large quantities of coal mainly for the Railway Services, are discharged.

(7) Air Facilities**Seaplane Station**

There is a Naval Seaplane Station at SAN ANDREA, East of VENICE (see Plan 46). There are numerous Hangars and Slips, Workshops and Stores.

There is a Civil Aerodrome near Fort S. NICOLO. The three Hangars at this Aerodrome have all been enlarged.

(8) War Material Factories

There are no known Factories which are used exclusively for this purpose, but there is a very large number of Factories which could undoubtedly be converted for the production of war material.

(9) Power Plants

Stations which controls some twenty

companies has been increased in later years.

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At the extreme South-Western end of the BRENTTELLA Canal, there are two Tanks. These belong to the *Società Anonima Sterol of BRESCIA and MILAN* engaged in the hydrogenation of animal oils.

There are large Underground Petrol Tanks at RANA, a district of MARGHERA.

Oil Refinery

Azienda Generale Italiana Petroli (A.G.I.P.) occupies 291,473 square yards West of the Società Nafta. The whole of the plant has been taken over by the Italian Government.

A.G.I.P. is the only Oil Refinery in this district. The combine is believed to possess some 20 Tanks, the largest having a capacity of 6,000 tons. Their Total Storage Capacity amounts to about 15,000 tons. The production of this combine has reached 100,000 tons annually.

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(9) Power Plants

Electric Power Stations

The power produced by the Società Adriatica di Elettricità, which controls some twenty odd companies, is derived principally from Hydro-Electric Stations in the VENETO.

Of these the four principal are situated at PEDESALTO SUL CISON, in the Province of VICENZA, North-East of ASIAGO and about 5 miles due West of FELTRE. They are at SANTA CROCE in the Province of BELLUNO, about 10 miles South-East of BELLUNO Town, at CELLINA, West of SANTA CROCE, but actually in the Province of UDINE and on the ADIGE River, South and South-West of VERONA.

In addition to the foregoing the Company own or control subsidiary Thermo-Electric Stations at MONFALCONE, VENICE, PADUA, VERONA and RAVENNA, all of pre-1914 construction.

In 1931 a new Thermo-Electric Station was constructed at MARGHERA. This new plant which is built to burn coal and oil fuel has a power of 100,000 kw. and covers an area of 99 ft. by 213 ft. and is 66 ft. high.

The distributory network of the Società Adriatica covers practically the whole of North-East ITALY and stretches from POLA on the East to VERONA and FERRARA on the West and to ANCONA and the Marches in the South.

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(10) Transport Facilities

Road

The new Road between VENICE and the mainland has been completed and electric trolley cars now operate thereon.

Air

The following Services operate :—

FIUME-VENICE.
TRIESTE-VENICE-PAVIA-GENOA-MARSEILLES.
MUNICH-VENICE.
VENICE-ANCONA-BARI-BRINDISI.
VENICE-FLORENCE-ROME.
ROME-VENICE-VIENNA.

(11) Signal Communications

W/T Station

A W/T Station (two masts) is situated on the East side of SACCA FISOLA.

(12) Defences (see Plans 45, 46 and 50)

(i) Sea Front Defences

The Coast Defences of VENICE extend from Port PIAVE-VECCHIA to Port BRONDOLO, a distance of about 24 miles.

The majority of the fortifications are very conspicuous, standing up plainly against the low background. Their command is also very low. Most of the works are provided with wet ditches communicating with the canals.

(a) Coast Defence Batteries

Battery No. 1. *Fort SAN MICHELE* : Five guns of 4.7-in. calibre ; this is probably a Land Defence Battery.

Battery No. 2. *Fort SAN BRONDOLO* : Twenty-four guns of 4.7-in. calibre and 15 guns of 3.5-in. calibre. Apparently an old work for both Coast and Landward Defence.

Battery No. 3. *V. PENZO* : Six B.L. howitzers of 11-in. calibre.

Battery No. 4. *SOTTO MARINA* : Three B.L. guns of 6-in. calibre.

Battery No. 5. *Fort SAN FELICE* : Four guns of 3-in. calibre. Used as a Barracks, for men of the T.B. Station at CHIOGGIA.

Battery No. 6. *Fort CAROMAN (BARBARIGO)* : Four B.L. guns of 6-in. calibre.

Battery No. 6a. *PELESTRINA* : Four guns of 6-in. calibre.

Battery No. 6b. *SAN ANTONIO* : Sited half-way between SAN ANTONIO and MADONNA : Six guns of 6-in. calibre.

Battery No. 7. *Fort SAN STEFANO* : Six B.L. guns of 6-in. calibre.

Battery No. 8. *Fort SAN PIETRO* : Four B.L. guns of 6-in. calibre in shields.

Battery No. 9. *Fort ENRICO DANDOLO* : Six (old pattern) guns of 12.5-in. calibre mounted in barbettes ; two guns of 12-in. calibre in single turrets. Two Batteries separated by curtain wall, 50 yards long.

Battery No. 10. *Fort SAN PIETRO* : Four Q.F. guns of 3.9-in. calibre ; six Q.F. guns of 2.2-in. calibre. Old Fort, contains mine stores. Mine Observation Stations low down in North face of wall.

Battery No. 11. *ROCHETTA* : Five guns of 3-in. and six guns of 4.7-in. calibre.

W/T Station

A W/T Station (two masts) is situated on the East side of SACCA FISOLA.

(12) Defences (see Plans 45, 46 and 50)

(i) Sea Front Defences

The Coast Defences of VENICE extend from Port PIAVE-VECCHIA to Port BRONDOLO, a distance of about 24 miles.

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Battery No. 3. V. PENZO: Six B.L. howitzers of 11-in. calibre.

Battery No. 4. SOTTO MARINA: Three B.L. guns of 6-in. calibre.

Battery No. 5. Fort SAN FELICE: Four guns of 3-in. calibre. Used as a Barracks, for men of the T.B. Station at CHIOGGIA.

Battery No. 6. Fort CAROMAN (BARBARIGO): Four B.L. guns of 6-in. calibre.

Battery No. 6a. PELESTRINA: Four guns of 6-in. calibre.

Battery No. 6b. SAN ANTONIO: Sited half-way between SAN ANTONIO and MADONNA: Six guns of 6-in. calibre.

Battery No. 7. Fort SAN STEFANO: Six B.L. guns of 6-in. calibre.

Battery No. 8. Fort SAN PIETRO: Four B.L. guns of 6-in. calibre in shields.

Battery No. 9. Fort ENRICO DANDOLO: Six (old pattern) guns of 12.5-in. calibre mounted in barbettes; two guns of 12-in. calibre in single turrets. Two Batteries separated by curtain wall, 50 yards long.

Battery No. 10. Fort SAN PIETRO: Four Q.F. guns of 3.9-in. calibre; six Q.F. guns of 2.2-in. calibre. Old Fort, contains mine stores. Mine Observation Stations low down in North face of wall.

Battery No. 11. ROCHETTA: Five guns of 3-in. and six guns of 4.7-in. calibre.

Battery No. 11a. FORT ALBERONI: (?) guns of (?) calibre.

Battery No. 12. SAN LEONARDO: Six old pattern B.L. howitzers of 9.4-in. calibre.

Battery No. 13. Fort MALAMOCCO: Twelve howitzers of 9.4-in. calibre. Large closed earthwork.

Battery No. 14. Fort TERRE PERSE: Two B.L. guns of 15-in. calibre (calibre 50).

Battery No. 15. Forts CASA BIANCA and ANGELO EMO: Two B.L. guns of 11.8-in. calibre in armoured turrets; two Q.F. guns of 3-in. calibre; and (?) four B.L. guns of 9.4-in. calibre. It is possible that the four 9.4-in. guns have been removed.

Battery No. 16. Fort QUATTRO FONTANE: Two guns of 12-in. calibre. Mounted in high Barbette.

Battery No. 17. Fort SAN NICOLO: Three howitzers of 12-in. calibre; four guns of 6-in. calibre; ten Q.F. guns of 4.7-in. calibre; eight Q.F. guns of 3-in. calibre; and four guns of 6-in. calibre. This Fort consists of a number of Batteries. There are four additional 6-in. guns used for Land Defence.

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- Battery No. 18. Fort SAN ANDREA*: Twelve guns of 2.2-in. calibre.
- Battery No. 19. SAN ERASMO*: Six B.L. or Q.F. guns of 6-in. calibre.
- Battery No. 20. CREVAN REDOUBT*: Four old B.L. guns of 6.2-in. calibre and two B.L. guns of 6-in. calibre. An old brick work. The guns are not mounted but are kept in store.
- Battery No. 21. Fort TRE PORTI (1)*: (?) Disarmed.
- Battery No. 22. South-East of SABBIONI Point*, sited near the shore: Two (50 calibre) B.L. guns of 15-in. calibre.
- Battery No. 23. TRE PORTI (2)*: Three (50 calibre) howitzers of 12-in. calibre. A modern Battery.
- Battery No. 24. REGIA MARINA*: Two guns of 12-in. calibre in turrets. A modern Battery.
- Battery No. 25. SAN ANDREA*: Six guns of 6-in. calibre. Difficult to distinguish from seaward.
- Battery No. 26. Fort SAN MARCO (CAVALLINO Road)*: Two guns (in single turrets) of 12-in. calibre; four 6-in. Q.F. guns. The heavy guns are at the West end of the work.

Magazines

The Main Magazines are on the Island of CERTOSA (see Plan 46). The Island is entirely surrounded by a high red brick wall with Sentry Boxes, and contains a large number of small buildings separated from each other by earth traverses. Each building is provided with lightning conductors. There is a short Pier on the side of the Island nearest to VENICE, and away from the sea.

There is a large Explosives and Munitions Depot in Fort NICOLO DI LIDO which contains supplies for the Fleet and Coastal Artillery.

(iii) *Searchlights*

There are the following Searchlights (see Plan 46):—

- One near No. 9 Fort ENRICO DANDOLO.
- One at No. 10 Fort San PIETRO.
- Three near No. 11 ROCHETTA Battery.
- One north of No. 12 San LEONARDO Battery.
- One south of No. 12 San LEONARDO Battery.
- Two at No. 14 Fort TERRE PERSE.
- Two at No. 15 Fort ANGELO EMO.
- One at No. 17 Fort San NICOLO.

No details of these Searchlights are known.

(iv) *Local Seaward Defences**Minefields*

So far as is known, there are no permanent Minefields at VENICE.

The approaches to the Port were mined during the war of 1914-18, as shown on Plan 45. The mines in each line were 100 to 130 ft. apart, and were about 13 to 16 ft. below the surface.

The Mining Depot for the LIDO CHANNEL is situated at the North-West corner of Fort SAN NICOLO (No. 17). Several narrow-gauge railway lines ran from the Depot to various points inside the Fort.

A short distance West of ROCHETTA Battery (No. 11) is a shed in which mines were stored in 1914. Near it are two Landing Stages and six small Piers, each about 40 ft. long by 10 ft. wide, and provided with Hand Derricks. Fort SAN PIETRO (No. 10) was once, and still may be, the principal Mine Depot for the defence of the MALAMOCCO Channel. Close to the water's edge in the masonry wall of the North face of the Fort are two mining Observation

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Booms and A/S Nets

Anti-Submarine Booms have been placed in position but no details have been received.

(v) Local Air Defences.

Anti-Aircraft Batteries

- A.A. Battery No. 1. PELESTRINA : mounted in a Tower (?) A.A. guns of (?) calibre.
- A.A. Battery No. 2. QUATTRO FONTANE Fort : sited between the Fort and the 12-in. Battery near Hotel EXCELSIOR—six platforms for A.A. guns.
- A.A. Battery No. 3. Fort S. NICOLO : Four A.A. guns : 14 pounders.
- A.A. Battery No. 4. SAN GIORGIO : (?) A.A. guns of (?) calibre.
- A.A. Battery No. 5. TRESSE BATTERY : mounted at the Old Battery ; 1 A.A. gun of 3-in. calibre.

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- A.A. Battery No. 6. MESTRE*: Six A.A. guns of 2.9-in. calibre.
A.A. Battery No. 7. SAN SECONDO: mounted in the Fort: One A.A. gun of 3-in. calibre.
A.A. Battery No. 8. MURANO: (?) A.A. guns of (?) calibre.
A.A. Battery No. 9. SAN ERASMUS: (?) A.A. guns of (?) calibre.
A.A. Battery No. 10. TRE PORTI: (?) A.A. guns of (?) calibre.

Mobile A.A. Defences

There are at least four Lighters, two of which are self-propelled and fitted with Fire Control gear, in which are mounted (?) Four A.A. guns of 3-in. calibre.
 One of these is moored S. of SACCA Island.

(vi) *Land Defences*

VENICE was, at one time, strongly defended from the land side by numerous Forts and Batteries. In view of the removal of the Austrian menace, the old permanent Land Defences have probably been removed or replaced by semi-permanent works or mobile guns in accordance with modern practice.

(viii) *Garrison*

71st Infantry Regiment is located in the Barracks of "Isola di St. PIETRO" and near the Church of "La PIETA."

The Naval Scuola Meccanici (School for Mechanics) is located at the Arsenal.

VIAREGGIO

(Lat. 43° 52' N., Long. 10° 15' E.)

(See Admiralty Chart 157)

(1) **General Remarks**

VIAREGGIO is a small commercial port situated between SPEZIA and LEGHORN.

Anchorage

The anchorage off VIAREGGIO is exposed to Westerly winds. There is good holding ground Westward and North-Westward of the entrance to the harbour, but winds from the Western semi-circle send in a considerable sea.

Conspicuous Objects

At an elevation of 46 ft. there is a white octagonal tower on a rectangular dwelling at the root of the Northern mole; and at the head of the same mole there is a red iron light column 18 ft. high. Vessels approaching from Southward will identify the framework cranes and masts of the gunnery practice ground South-Eastward of the harbour. From the Northward Villa ROLANDO RICCI, with a lofty turret, is conspicuous.

In the Porto-Canale there is usually an outgoing current.

(2) **Port Facilities**

The Outer Harbour is contained between a mole which extends West-South-Westward from a point on the Northern side of the Canale della BURLAMACCA and a breakwater which extends in a curve North-Westward to a point 1½ cables South-Westward of the head of the Northern mole. It affords good shelter for small vessels from winds from North, through East and South, to South-West.

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The Inner Harbour is formed in the Canale della BURLAMACCA, which enters the outer harbour between the inner part of the Northern mole and another mole parallel with it. It is 80 ft. wide at the entrance and decreases higher up.

About 4 cables from the mouth of the canal, at the South-Western end of the town, an opening in the Southern side leads into Darsena TOWCANA which communicates on its Western side with Darsena ITALIA, and a quarter of a mile further up on the same side is Darsena LUCCA. The construction of a further Darsena, 560 ft. by 520 ft., South-Westward of Darsena Italia, is in process of completion.

Depths of Water

There are depths of from 6 to 15 ft. in the outer harbour, which tends to silt and requires constant dredging.

A depth of 8 ft. is maintained in the three older basins, and there is to be 12 ft. in the new one. The depth of the canal is maintained as far as possible at 8½ ft. by constant dredging, but the depth is sometimes as little as 5 ft.

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Accommodation

Only very small vessels can be accommodated.

Method of Discharge

Cargoes are discharged into lighters in the Outer Harbour and alongside in the Darsenas.

Lighting Appliances

None reported.

Trade

Exports are fruit, marble, flour and oil. Imports are coal, cheese, cereals, bones, scrap iron, oil, olive husks and salt.

Harbour Craft

Lighters and tugs are available.

(3) The Town

The town, with a population of about 27,000, is situated on a plain between two groups of pine trees on the Northern side of Canale della BURLAMACCA. There is a hospital in the town.

(4) Government Establishments

Gunnery Practice Ground

A gunnery practice ground is situated South-Eastward of the harbour. It can be identified by framework cranes and masts.

Artillery practice takes place to seaward and vessels are warned, by displaying flag "U" of the International Code at VIAREGGIO and at intermediate places, not to approach within three miles of the coast between VIAREGGIO and the mouth of FIUME SERCHIO, seven miles to the Southwards.

(5) Commercial Establishments

Ship Repairs

Repairs can be carried out to wooden vessels.

(7) Air Facilities

Seaplane Alighting Area

Seaplanes alight in the Outer Harbour in the area bounded by the Southern mole of the Porto-Canale and the breakwater.

(10) Transport Facilities

Roads

There is a main road along the coast to the Northward. This turns inland at MARINA de CARRARA, and at AVENZA joins another main road to the Northward from LEGHORN via PISA to SARZANA and SPEZIA.

Just North of VIAREGGIO a main branch road leads to LUCCA, PISTOIA and FIRENZE (FLORENCE).

Railway

There is a double track line Northward to MASSA and SPEZIA and Southward to PISA and LEGHORN. There is a single line track Eastward to LUCCA.

(12) Defences

Coast Defence Batteries

(3) **The Town**

The town, with a population of about 27,000, is situated on a plain between two groups of pine trees on the Northern side of Canale della BURLAMACCA. There is a hospital in the town.

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Roads

There is a main road along the coast to the Northward. This turns inland at MARINA de CARRARA, and at AVENZA joins another main road to the Northward from LEGHORN via PISA to SARZANA and SPEZIA.

Just North of VIAREGGIO a main branch road leads to LUCCA, PISTOIA and FIRENZE (FLORENCE).

Railway

There is a double track line Northward to MASSA and SPEZIA and Southward to PISA and LEGHORN. There is a single line track Eastward to LUCCA.

(12) **Defences**

Coast Defence Batteries

Reports, with no details, have been received that VIAREGGIO is defended by a coast defence battery. It is possible that mobile guns carrying out a target practice to seaward from the gunnery practice ground south of the town may have been mistaken for a coast defence battery. Any such guns present could be used for coast defence if required.

VILLA SAN GIOVANNI

(Lat. 38° 13' N., Long. 15° 38' E.)

(See Admiralty Chart 177 and Plan 21)

(1) **General Remarks**

VILLA SAN GIOVANNI is a small harbour in the Straits of MESSINA: it is situated about three-quarters of a mile Southward of Punta PEZZO and is the nearest harbour on the mainland to MESSINA in SICILY.

It is of importance because it is the Railway Terminus and embarkation point for train ferries to SICILY: a successful attack would considerably interrupt all traffic to the Island.

VILLA SAN GIOVANNI 331

Conspicuous Objects

There is an iron framework structure, with a light on it, 20 ft. in height, with a hut at its foot, 360 ft. within the head of the Mole; there is another light structure at the head of the Mole.

Tides, Currents and Weather

See Mediterranean Pilot, Volume 1.

(2) Port Facilities

Description of Harbour

The Harbour is formed by a mole about 970 ft. long which projects seawards at an angle of 328° from the shore.

Three small piers, one of length 225 ft., and two of 180 ft. respectively, project North-Westwards from the South-East part of the harbour: these serve as guides for the Train Ferries.

Two small piers of length 120 and 75 ft. respectively, project Westwards from the land immediately North of the Harbour.

Quays and Jetties

The Mole is quayed on its Eastern side for the whole of its length: at the head of the Mole there are depths of 6½ fathoms: soundings decrease to 3½ fathoms alongside near the root. The Eastern side of the Harbour is quayed for a length of about 670 ft.

Method of Discharge

By Train Ferry to MESSINA (see paragraph (10) TRANSPORT FACILITIES) and alongside the quays. There is not room for vessels to secure stern-to.

Lifting Appliances

There is one large floating crane.

Estimated Daily Capacity

Excluding the Train Ferry the estimated daily capacity—unloading from one store ship alongside—is 400 tons per day.

Note.—For Capacity of Train Ferry, see paragraph (10) TRANSPORT FACILITIES.

Warehouses and Stacking Space

There is a large building in the South-East corner of the Harbour which is probably a warehouse: there are also several long buildings East of the Railway Terminus which may be, or possibly could be, used as warehouses.

Facilities for Clearing the Port Area

Trains run from the Train Ferries on to the Main Railway System. There is a large Railway Terminus and Embarkation Depot South of the Harbour. There are four main line tracks along the quay on the East side of the Harbour which break into eight parallel tracks which in turn converge into two tracks leading North to SCILLA: two tracks lead South to REGGIO di CALABRIA. There are 15 long sidings situated East of the Main Line, East of the Harbour. Large quantities of rolling stock are always present, including Petrol Tankers. Trains bound for SICILY are, of course, shunted on to the Train Ferries.

(3) The Town

The Town is small and of no importance in itself. There is a Cathedral.

(4) Government Establishments

There is a large barracks between the Railway Station and the Main Coastal Road.

Two small piers of length 120 and 78 ft. respectively, project westwards from the land immediately North of the Harbour.

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(3) *The Town*

The Town is small and of no importance in itself. There is a Cathedral.

(4) *Government Establishments*

There is a large barracks between the Railway Station and the Main Coastal Road.

There are also buildings North-East of the Harbour near the seashore which are believed to be barracks and other similar buildings 2,850 yards North-East of the Harbour and on the North side of the road leading to S. ROBERTO, 2,400 yards East of the Harbour.

(5) *Commercial Establishments*

There are three factories visible from seaward: one, with a chimney, is sited on an eminence on the Northern side of the Town: another, low and extensive, painted red, is close to the coast end and there is another, with a chimney, behind it.

(10) *Transport Facilities*

Road

VILLA SAN GIOVANNI is on the Main Coastal Road which runs to NAPLES and the North, and Southwards all round the "toe" of ITALY.

Three is a secondary road Eastward to FONDACO.

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Railway

VILLA SAN GIOVANNI is on the Main Coastal Railway which runs to NAPLES and the North, and Southwards all round the "toe" of ITALY.

It is also connected, by means of the Train Ferry, with the Railway system of SICILY.

Vulnerable Points on Road and Railway

The Main Road follows the railway line and crosses two bridges on either side of CATONA. There are also two railway bridges.

Train Ferry

VILLA SAN GIOVANNI is one of the two Mainland terminals of the Train Ferry Service to MESSINA: the other terminal is at REGGIO di CALABRIA. Through trains from the North of ITALY, ROME and NAPLES are taken across in the ferries: this route provides the quickest and most direct transport for troops and supplies between ITALY and SICILY. The trains run straight on to the ferry boats and are taken across the Straits to MESSINA: the distance, 5 miles, is covered in 35 minutes.

Vulnerability of the Train Ferry Service

Apart from sinking the Train Ferries themselves, to cause a permanent break in this very important link between the Mainland and SICILY, the Landing Bridge or the hoist would have to be destroyed.

The hoist, which is electrically operated, by a 110-volt direct current motor, with an alternative hand mechanism, is situated at the seaward end of the movable bridge. Its function is to raise and lower the movable bridge which connects the land railway lines with those on board the ferry.

Capacity of the Ferry

In preparing this estimate, allowance has been made for a total of six ferry boats working simultaneously from VILLA SAN GIOVANNI and REGGIO di CALABRIA for a 20-hour day; half an hour has been allowed for embarking, unmooring, mooring and disembarking and 4 hours per 24 hours for bunkering, taking in water and stores, and for running repairs.

On the above assumptions the amount of stores which could be transferred from VILLA SAN GIOVANNI per day to MESSINA is:—6,080 tons per day.
from REGGIO add . . . 1,680 tons per day.

TOTAL FROM MAINLAND 7,760 tons per day.

The above quantities are well within the capacity of the delivery terminals at MESSINA.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

The Coast Defences of VILLA SAN GIOVANNI are included in the Defences of MESSINA (see Plan 21).

(g) Ammunition Storage

A probable Ammunition Dump is situated in an isolated building 150 yards South of the road to San ROBERTO—1,600 yards East of the Harbour.

(v) Local Air Defences

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The hoist, which is electrically operated, by a 110-volt direct current motor, with an alternative hand mechanism, is situated at the seaward end of the movable bridge. Its function is to raise and lower the movable bridge which connects the land railway lines with those on board the ferry.

Capacity of the Ferry

In preparing this estimate, allowance has been made for a total of six ferry boats working simultaneously from VILLA SAN GIOVANNI and REGGIO di CALABRIA for a 20-hour day; half an hour has been allowed for embarking, unmooring, mooring and disembarking and 4 hours per 24 hours for bunkering, taking in water and stores, and for running repairs.

On the above assumptions the amount of stores which could be transferred from VILLA SAN GIOVANNI per day to MESSINA is:—6,080 tons per day.
from REGGIO add 1,680 tons per day.

TOTAL FROM MAINLAND 7,760 tons per day.

The above quantities are well within the capacity of the delivery terminals at MESSINA.

(12) Defences

(i) Sea Front Defences

(a) Coast Defence Batteries

The Coast Defences of VILLA SAN GIOVANNI are included in the Defences of MESSINA (see Plan 21).

(g) Ammunition Storage

A probable Ammunition Dump is situated in an isolated building 150 yards South of the road to San ROBERTO—1,600 yards East of the Harbour.

(v) Local Air Defences

(a) A.A. Batteries

A.A. Battery No.	Name, Location, Description.	Armament.	Grading.	Date of Latest Report.
A.A.1	PIALE: sited about 200 yards North of the village.	4—? calibre A.A. guns	A.2	1941
A.A.2	Sited 400 yards South of the harbour ..	3—? calibre A.A. guns	B.0	1941
A.A.3	700 yards South-East of VILLA SAN GIOVANNI Harbour.	5—? calibre (light) or M.G.s	A.2	1942
A.A.4	2,000 yards South-South-East of SAN GIOVANNI Harbour.	4—? calibre (heavy) ..	A.2	1942
A.A.5	ABRAMI: sited about 400 yards South-West of the cross roads.	4—? calibre A.A. guns	A.2	1941

ZARA 333

ZARA

(Lat. 44° 07' N., Long. 15° 14' E.)

(See Plans 51, 51a and 52, and Admiralty Chart 2774)

(1) General Remarks

ZARA or PORTO DI ZARA is situated abreast the middle of ULJAN (UGLIANO) Island. The Harbour lies inside a promontory, which projects about $\frac{1}{2}$ mile North-Westward parallel with the coast, on which ZARA is built. For approaches see Sailing Directions. The Anchorage is classed as "A," is capable of defence and is secure from seaward observation. The North-East end of the channel off ZARA is over 2 miles wide and 20 miles from the open sea. Large vessels anchor about $3\frac{1}{2}$ cables Westward of the Town in depths of 15 to 20 fathoms, mud, or farther out as convenient. This anchorage is called RADA DI ZARA.

RADI DI MAISTRO, situated Southward of PUNTA AMICA (Lat. 44° 08' N., Long. 15° 12' E.) affords good anchorage for large vessels in depths of 13 to 20 fathoms, mostly mud bottom. The North-Eastern side of the road forms four small bays of which BAIJA DI MAISTRO, in which small vessels find shelter in North-Westerly winds, is the largest.

The Dalmatian coast near ZARA is fronted by ULJAN, PASMAN, CROSSA, INCORONATA, and a number of other small Islands, Islets and Rocks, which effectively bar the direct approach from seaward and provide suitable shelter for the operations of Submarine and Torpedo Craft. Numerous narrow passages lead through this fringe of Islands, but they are mostly obstructed by Rocks and Shoals. The best approach is through the SELVE Channel, 34 miles North-West of ZARA.

ZARA was used by the Austrians during the War of 1914-18 as a T.B.D. Station and the Harbour has accommodation for a Destroyer Flotilla. Contrary to earlier reports, it does not now appear that ZARA is being developed as a Naval Base.

(2) Port Facilities

The Riva IV Novembre extends from the Health Office to the PORTO S. ROCCO. There is a depth of from four to five fathoms alongside at the Health Office end, where the mail and passenger steamships berth. The depth decreases towards the head of the Harbour. There is a Travelling Crane on the Quay as shown on Plan 51. The RIVA S. ROCCO now only extends from PORTO S. ROCCO South for 1,200 ft. This Quay has been demolished at the head of the Harbour owing to the lack of water. There is about 10 to 12 ft. of water by the bridge, and small fishing boats and trading craft lie alongside.

The RIVA CRISTOFORO COLOMBO extends along the East side of the Harbour. Depth of water 6 to 8 ft.

The VALLE DI BORA is the main Anchorage for Warships up to Gunboat size. Alongside there is only about 6 ft. of water, but in the actual Anchorage marked on Plan 51, there is from 15 to 20 ft. The smaller craft such as motor launches and small tugs lie alongside the Breakwater. There are from four to five fathoms at the end, but the depth rapidly shoals down to one fathom or less near the shore.

The DERNA QUAY extends from the BASTION D. SANITA to the War Memorial. Depth of water three to four fathoms alongside, not greatly used as it is exposed.

The RIVA VITTORIO EMANUELE III extends along the West front from the War Memorial to the Fossa—depth of water 8 to 10 ft. The mole on this Quay is suitable as a landing place, the inner side being well sheltered and suitable for small boats. The depth at the head of this mole is 18 ft. shelving to 10 ft. at the inshore end.

All Quays are lit by electricity and have numerous bollards. Fresh water is laid on.

There are no Dry Docks, Floating Docks or Patent Slips. The only known Slipway in the Harbour is one for launching small boats of the fishing type from the small Boat-Building Yard in the VALLE DI BORA.

MAISTRO, in which small vessels find shelter in North-Westerly winds, is the largest. The Dalmatian coast near ZARA is fronted by ULJAN, PASMAN, CROSSA, INCORONATA, and a number of other small Islands, Islets and Rocks, which effectively bar the direct approach from seaward and provide suitable shelter for the operations of Submarine and Torpedo Craft. Numerous narrow passages lead through this fringe of Islands, but they are mostly obstructed by Rocks and Shoals. The best approach is through the SELVE Channel, 34 miles North-West of ZARA.

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There are no Dry Docks, Floating Docks or Patent Slips. The only known Slipway in the Harbour is one for launching small boats of the fishing type from the small Boat-Building Yard in the VALLE DI BORA.

Harbour Craft.—One Lighter with Sheerlegs of three tons capacity.

Two Oil Lighters.

One large Cargo Lighter.

(3) The Town

ZARA lies on a promontory running North-West and South-East. The Harbour runs in on the East side of the Town. The RIVA VITTORIO EMANUELE III, which forms the water front on the West side of the Town, is very well built and carries a number of large buildings which extend the whole length, giving a most imposing appearance from the sea.

Inside the Town the streets are very narrow and the buildings are crowded together. It is kept very clean and appears to be well organised.

The present population is 12,000 in the Town and 18,000 in the whole province. The billeting capacity would be about 70,000. It would not be possible to billet in the outer districts as the houses are mostly small shacks and quite unsuitable.

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The principal industry is the manufacture of Liqueurs and Syrups. The Business Quarter is principally on the East side of the Town.

The Lighting System is electric.

The water is good, but contains a certain amount of calcium.

Sanitation is good in the Town and is carried out on the modern system.

Hospitals

The Main Hospital is situated in the South of the Town. It is a very large Civil Hospital and appears to be much too big for the district. It has obviously been constructed with a view to its use by the Military if necessary. It is estimated that there were 200 beds available, but there is accommodation for many more.

There is a smaller Hospital in the Town, near the Swing Bridge.

The Naval Establishments are not very extensive. There is a Naval Barracks.

Military Establishments

Many of the Military Establishments are new and well made, a number of them having been constructed during the past three years.

There are three Main Barracks for the 9th Regiment of Bersaglieri, which has three Battalions, one in the Town and two outside.

Their gun-park together with the Horse Transport Lines is situated in the Piazza D'ARMI.

The 3rd Regiment of Artillery occupies the CASERNA GRANDE Barracks.

The National Volunteers occupy the CASERNA S. DOMENICO.

The "Giardino Militaire," is most probably the position of the Powder Magazine.

The Munition Dump occupies a large area and is enclosed by a high barbed-wire fence.

(5) Commercial Establishments

Fuel Stocks

There are limited stocks of coal, petrol and oil.

Other Factories

There is an Ice Factory and also a large Tobacco Factory near the Main Hospital.

There are also some 15 small Factories which produce various articles of food, etc.

(6) Aircraft Factories

Nil.

(7) Air Facilities

Air Facilities Possessed by the S.I.S.A. Line

This line operates Flying Boats of the Cant 22R.1 type, equipped with three engines (one 500 H.P. and two 250 H.P., Isotta-Fraschini) and having a carrying capacity of nine passengers.

The machines land outside the Harbour and taxi straight in, making fast to mooring buoys, situated in the PORTO DI ZARA.

The Harbour makes an ideal sheltered base for Flying Boats and improvements in the flying facilities are to be carried out shortly.

ZARA is not apparently used as a Seaplane Base by the Italian Air Force, although it could be used as such without any additional preparations.

There is a Civil Customs Seaplane Base in Lat. 44° 08' N., Long. 15° 13' E., with two Basins suitable for Seaplanes. One dilapidated Hangar. No moorings. Two Slipways, Workshops, supplies of petrol and oil, rail, road, Telegraph and W/T Communication.

There is a Slipway and an old building, which looks like a Hangar, on COLONIA MARINA Point.

(8) War Material Factories

Nil.

(9) Power Plants

There are no Gasworks; the Town is lit by electricity. The Electric Power Plant is situated in the

Battalions, one in the Town and two outside.

Their gun-park together with the Horse Transport Lines is situated in the Piazza DARMI. The 3rd Regiment of Artillery occupies the CASERNA GRANDE Barracks.

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There is a Slipway and an old building, which looks like a Hangar, on COLONIA MARINA Point.

(8) War Material Factories

Nil.

(9) Power Plants

There are no Gasworks; the Town is lit by electricity. The Electric Power Plant is on the South side of the Fossa.

The Main Water Supply is vulnerable, as it comes from a Reservoir at BOCCAGN AZZO Village which is some distance from ZARA. There is a Pumping Station further out which pumps the water along a conduit to the Town. The Secondary Supply is from wells in the Town.

(10) Transport Facilities

Roads

Roads in the ZARA zone are in good condition, being hard metalled roads. A considerable number of new roads have been built within recent years. These roads run principally from North-West to South-East, connecting the Northern and Southern sides of the zone.

The roads in Yugo-Slavian territory are poor.

The only Bus Service which has been observed runs from ZARA to BABINDUB.

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Railways

Nil.

Air

There are two Air Services which call at ZARA :—

- (1) *The ANCONA-ZARA Line.*—Leaves ANCONA 0830—Arrives ZARA 0945. Leaves ZARA 1500—Arrives ANCONA 1615.
This Service only operates between these two places.
- (2) *The PORTO ROSE-BRINDISI Line.*—This line (Flying Boats) arrives and leaves ZARA twice daily.

Waterways

Four Steamship Lines call at ZARA : the principal one being the "ADRIATICA LINE," the others are the "ANCONA-ZARA LINE," the "VENEZIA-BARI LINE" and the "VENEZIA-TRIESTE-DALMAZIA LINE."

(11) **Signal Communications**

There is a W/T Station at ZARA, position Lat. 44° 07' 10" N., Long. 15° 13' 35" E. Range 120-200 miles. Wave lengths, 600, 900 and 1,200 metres. Call sign IQO.

There are Cables to POLA and ULJAN Island.

As far as is known there are telegraph lines to FIUME via NIN, to OBROVACO and to SIBENIK.

There is a good Telephone Service which connects ZARA with the outlying districts. All the Italian Frontier Posts are connected up by Telephone.

(12) **Defences**

(i) *Sea Front Defences*

(a) *Coast Defence Batteries—on the North*

Battery No. 1. PUNTAMICA : on the North-West side of PUNTAMICA Point, facing West. Gun positions are sited in the front edge of a small wood giving partial concealment.

Battery No. 2. ZARA : there are four guns of (?) 3-in. calibre with mountings fixed in concrete : sited outside the Governor's House.

Arcs of fire—from 180° to 315°.

The Battery Commander's Post is situated in a Signal Station close alongside the Battery, to the South.

The Battery is enclosed by wire and defended by Machine Gun Posts in the vicinity.

These Defences would be vulnerable to attack by ship's guns, as the guns are placed in the front edge of the wood without any protection.

The Signal Station is in a conspicuous position on the coast.

On the South

Battery No. 3. BORGO ERIZZO : there appears to be a prepared position for two A.T.C. guns situated some 200 yards South-East of BORGO ERIZZO.

Battery No. 4. COLOVARE : situated on COLOVARE Peninsula. Four gun platforms for guns of (?) 11-in. calibre were reported to be in course of construction some six years ago. No further information has been received.

The emplacements are said to be protected on three sides against small arms fire, by stone walls.

(ii) *Movable Armament*

This consists of guns of about 13-pdr. calibre which are manned by the 3rd Regiment of

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The emplacements are said to be protected on three sides against small arms fire, by stone walls.

(ii) Movable Armament

This consists of guns of about 13-pdr. calibre which are manned by the 3rd Regiment of Artillery. Assuming that the Artillery organisation is on the same basis as that of the Infantry, this Regiment would have three Batteries. The guns are kept in a large shed in which transport is also stored.

(iv) Local Seaward Defences

Boom Defence

There is an A/S Boom across the entrance to the Harbour.

(v) Local Air Defences

Anti-Aircraft Defences

No information received.

(vi) Land Defences

Two gun positions have been observed close to DUE TORRETTE sited in the front edge of a sparse wood. They are well camouflaged and about 50 yards from a good road, with a good line of approach.

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The positions are banked up and appear to be for howitzers. They are sited on the forward slope of the CLE DI BOCCAGNAZZO, giving a good all-round field of fire, "direct" towards the Sea and "indirect" over the ridge to the East.

A concrete Blockhouse is situated immediately North-East of the D in DUE TORRETTE. A triple barbed wire fence runs around the outer perimeter of ZARA and is in very good condition.

Inside the wire, and close to it, there are numerous high-sited Machine Gun Positions with good fields of fire. These are made of concrete and have two concrete shelter and fire trenches connecting to them. They are in very good condition.

There are also a large number of camouflaged Machine Gun Positions made of earth and stone, placed in the front edges of woods facing the wire.

There are several concrete Blockhouses inside the wire, sited in positions giving good fields of fire. These are about 15 ft. high, 30 ft. wide and 20 ft. deep. They are loop-holed for machine guns and would form most convenient rallying points. There is said to be fifteen of these in the area, and all have good roads leading to them.

The System of Defence appears to be based on the following considerations:—

The main weapon is the machine gun. Half the troops are equipped with bicycles enabling them to proceed at full speed to any point of the boundary which is attacked.

ULJAN Island did not appear to have any gun positions on it, but on top of one of the hills, opposite ZARA, is situated the Castle of St. Michele. This is used by the Yugo-Slavs as a Look-Out Post; it has a view of thirty miles and is connected by Telephone.

The frontier stretches over approximately 15½ miles. There are ten Frontier Posts, Nos. 1 and 10 being on the coast to the North and South respectively. The remainder are situated on all roads leading out of ZARA to Yugo-Slavia, and at important points. Between Posts 7 and 8 the road is international.

The Italian Posts are strongly constructed concrete buildings, loop-holed for machine guns. The Yugo-Slav Posts are very much smaller.

The Yugo-Slavs have strengthened up their detachments at Frontier Posts from fifteen to twenty-five men; the Italians have strengthened their detachments from ten to fifteen men. These numbers only apply to the more important Posts.

(viii) Garrison

It is believed that there are 3,500 troops, including Gunners and Engineers. The troops consist of the 9th Regiment of Bersaglieri, comprising three Battalions each 1,000 strong, the remaining 500 are Gunners and Engineers.

The Carabinieri number from 150 to 200 and carry out the police work of the district.

A number of the troops carry revolvers under their tunics, on the right side; these are probably Machine-Gunners. The Infantry are armed with a very short rifle.

Three years ago there were only a few troops and one barbed wire fence running around ZARA. Since then the Defences have been greatly strengthened.

(13) Reconnaissance

The beaches are stony, consisting of flints, boulders and small rocks; they are not, however, steep. A fully loaded cutter would ground at from six to eight feet from the shore.

The Northern portion of the Zone is strongly defended and a landing there would be opposed by heavy machine gun fire and fire from the PUNTAMICA Battery.

To the South, the Zone is not so strongly defended and there is deep water to within approximately 20 yards from the shore, where a ridge of rock forms a bank and reduces the depth to six feet: this depth continues uniformly until within ten yards of the shore, when it gradually shelves.

The water is very shallow in the VLE DI S. CLEMENTE.

ZARA Zone

Article 2 of the Treaty of Rapallo, dated 12th November, 1920, is as follows:—

"ZARA and the territory hereinafter described are recognised as forming part of the Kingdom of ITALY. The territory of ZARA and the territory of the Kingdom of ITALY."

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