TAINAN AND VICINITY

(Reconnaissance photo coverage: 7 November 1943)

Formosa's second largest city, Tainan is noted for its schools and commercial houses, but has few industries. The adjoining Tainan Salt and Magnesium Works (Targets 89 and 110) consitute the only industrial objectives of any significance. A large sugar refinery, not designated as a target, is located near the village of Sharoken, about 1 mile SE of the Einansho Airport.

The city is more important as a military center, being the site of an extensive barracks development (Target 112) and training ground. The large and well equipped Einansho Airport is located just to the south.

Tainan is located on the trunk line railroad to Takao, and its railroad facilities include small shops and a few storehouses. The Tainan Canal extends from a barge basin in the city to the port town of Anping. Large ships sometimes lighter off the Anping roadstead, but most of the vessels which call here are small coastal ships.

TARGET TABULATION

No.	Name	Approximate Coordinates	Description and Significance
112	Tainan Barracks	23° 00' N 120° 12' E	Barracks & training grounds, E, N and NW of RR Station. Bldgs occupy about 1 square mi. Several schools in NW & S parts of town may be converted to military use.
110	Tainan Magnesium Plant (Minami Nippon KK)	23° 00' N 120° 09' E	Magnesium works, capacity unknown, operated in conjunction with Tainan Salt Works.
89	Tainan Salt Works	23° 00' N 120° 09' E	Large industrial salt works; extensive salt beds to N & S. Plant bldgs of light construction, but could be easily repaired.

CONFIDENTIAL
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ANPING, FORMOSA
23° 00' N – 120° 09' E
Date: 7 Nov. 1943

APPROXIMATE SCALE
0 1/4 1/2 3/4 1 2
STATUTE MILES

CONFIDENTIAL
(British Confidential)

TO SAIKO 10 MI.
TO KAGI 43 MI.
CAUSEWAY
RADIO STATION 3 TOWERS
TO KAGI 39 MI.
LIGHT INDUSTRY (TYPE UNKNOWN)
RACE COURSE
TARGET RANGE
M/G TRENCHES
A/A EMPLS W/O GUNS
2 SPAN BRIDGE 240'
6 SPAN BRIDGE 380'
SINGLE SPAN BRIDGE 75'
MUNITIONS STORAGE
R.R. YARD
TURNTABLE
T.112
R.R. S
2 SPAN BRIDGE 310'
TO KARI 15 MI.
SINGLE SPAN BRIDGE 70'
HOSPITAL
SCHOOLS-NOW PROB. CONVERTED TO MILITARY BARRACKS
T A I N A N
DAM
PROB. MOTOR PARK
PRISON
SMALL BOAT YARD
WARE
TAINAN CANAL
To Anping

N

TAINAN, FORMOSA

23° 01' N - 120° 12' E

DATE OF PHOTOGRAPHY, 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000' 3000'

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TO KAGI 43 MI.
CAUSEWAY
RADIO STATION 3 TOWERS
TO KAGI 39 MI.
LIGHT INDUSTRY (TYPE UNKNOWN)
RACE COURSE
TARGET RANGE
M/G TRENCHES
6 SPAN BRIDGE 380'
A/A EMPLS W/O GUNS
MILITARY ZONE
SINGLE SPAN BRIDGE 75'
MUNITIONS STORAGE
MUNITIONS STORAGE
AGRICULTURAL EXPERIMENTAL FARM
R.R. YARDS
TURNTABLE
T.112
PROB. A/A BATTERIES
R.R. STATION
R.R. REPAIR SHOPS
TO TAKAO 27 MI.
BRICK PLANT
HOSPITAL
TO TAKAO 29 MI.
SINGLE SPAN BRIDGE 70'
RADIO STATION 2 TOWERS
SCHOOL DISTRICT NOW PROBABLY MILITARY AREA
SCHOOLS-NOW PROB. CONVERTED TO MILITARY BARRACKS
TAINAN
PROB. MOTOR PARK
PRISON
DAM
SMALL BOAT YARD
REPORTED TEXTILE PLANT
WAREHOUSE AREA
RADIO STATION 4 TOWERS
TAINAN CANAL
To Anping

U. S. CONFIDENTIAL
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PROBABLE RR SPUR

PROBABLE SUPPLY DEPOT UNDER CONSTRUCTION

SWIMMING POOL

RADIO TOWERS

POSSIBLE COVERED STORAGE

HANGAR AREA

STORAGE REVETMENTS

TO TAKAO - 26 M

SHA
SUGAR

TO KAGI 70 MILES

TO KAGI 70 MILES

TAINAN

DISPERSAL AREA

OPEN STORAGE AREA

PERSONNEL QUARTERS

ADMINISTRATION AREA

UNIDENTIFED INSTALLATIONS

EINANSHO AIRPORT

DISPERSAL AREA

TARGET BUTT

REVETTED BUILDING

STORAGE REVETMENTS

TAINAN, FORMOSA

22° 58' N - 120° 12' E

DATE OF PHOTOGRAPHY - 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

SHAROKEN SUGAR REFINERY

TO TAKAO 24 MILES

PROBABLE RR SPUR

PROBABLE SUPPLY DEPOT UNDER CONSTRUCTION

TO TAKAO - 26 MILES

SWIMMING POOL

RADIO TOWERS

POSSIBLE COVERED STORAGE

OPEN STORAGE AREA

HANGAR AREA

STORAGE REVETMENTS

DISPERSAL AREA

PERSONNEL QUARTERS

RIVER

ADMINISTRATION AREA

UNIDENTIFED INSTALLATIONS

EINANSHO AIRPORT

DISPERSAL AREA

TARGET BUTT

REVETTED BUILDING

STORAGE REVETMENTS

MISOKO

ABANDONED BARRACKS SITE

ORMOSA

20° 12' E

Y-7 NOVEMBER 1943

E SCALE
1000' 2000'

AS, INTELLIGENCE

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

OKAYAMA DISTRICT

(Reconnaissance Photo Coverage: 7 November 1943)

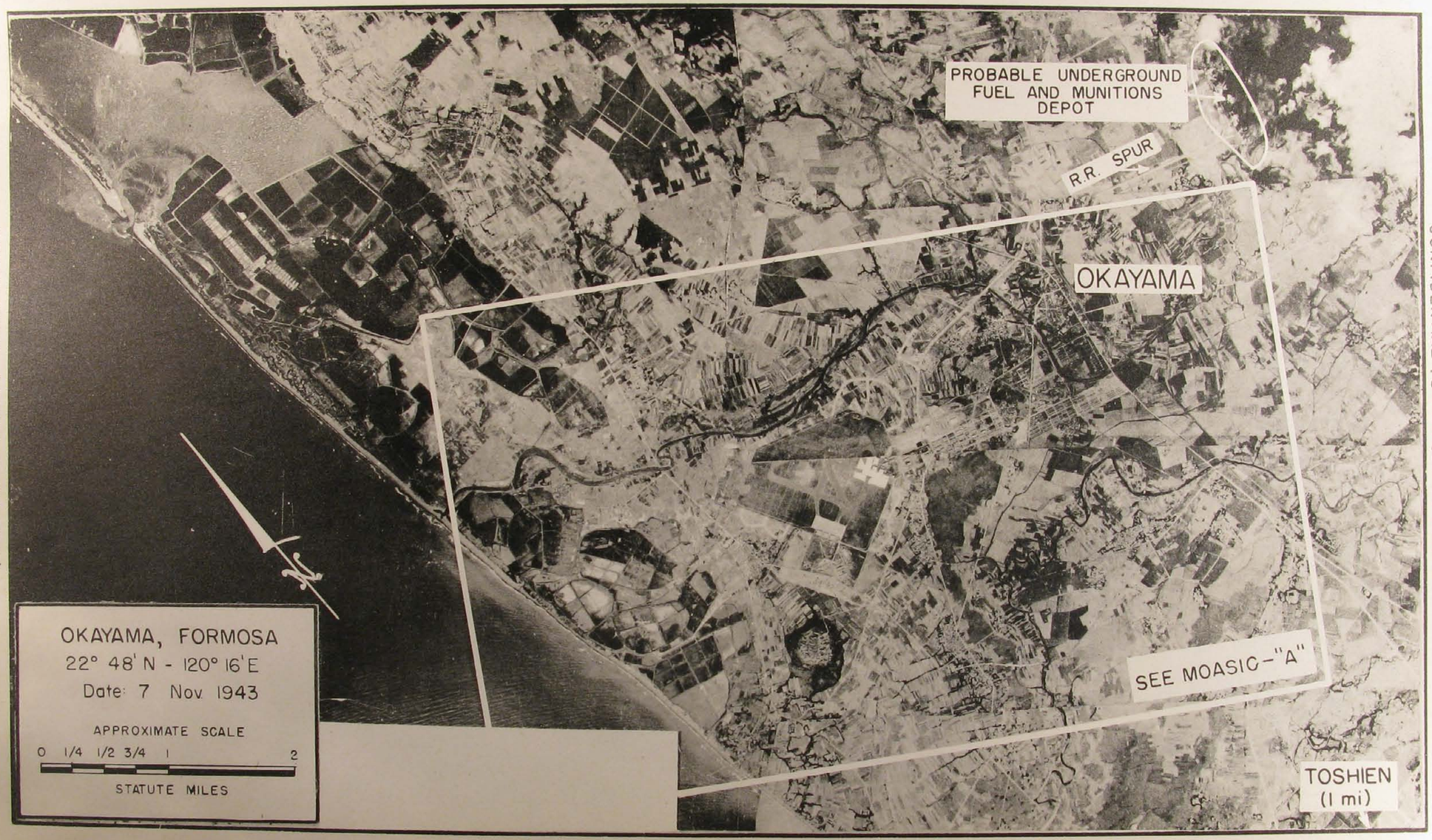
The large and completely equipped Okayama Airport together with an adjoining aircraft plant (Target 166) are outstanding among the objectives in Formosa. The field is equipped with extensive dispersal revetments along all sides, numerous shops, storage buildings and large hangars. To the SE, just beyond the administrative buildings, is a group of about 70 buildings which appears to be an aircraft assembly or modification plant. A large housing development is located just E of the plant. In addition, housing facilities are available at Okayama, about 1 mile away. The plant's size indicates that it may have a substantial capacity, particularly for an area outside Japan Proper.

With the exception of 3 hangars and numerous warehouses to the SW, and barracks to the E, all large buildings (including the aircraft works) are clustered within an area measuring 5000 by 2000 feet.

One of Formosa's largest sugar and alcohol plants (Target 168) is located at Kyoshito, about 3 miles south of Okayama.

TABULATION OF TARGETS

No.	Name	Approximate Coordinates	Description and Significance
166	Okayama Aircraft Plant	22° 48' N 120° 16' E	About 70 closely-spaced buildings, occupying 2800 by 1200 feet. Airport administration buildings to west and housing development to east.
168	Kyoshito Sugar & Alcohol Plant (Taiwan Semo K)	22° 46' N 120° 17' E	Plant, marked by long shed-type buildings occupies area of 1500 by 700 feet. Located on Okayama-Takoo RR. Capacity: over 30,000 gallons alcohol per year (part of this is absolute alcohol).



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BRITISH CONFIDENTIAL

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

OKAYAMA, FORMOSA

MOSAIC "A"

22° 47' 30" N 120° 15' E

DATE OF PHOTOGRAPHY, 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0' 1000' 2000' 3000'

OFFICE OF THE AC/AS, INTELLIGENCE

RR BRIDGE (150')
HWY BRIDGE
OKAYAMA
(70') HWY BRIDGES (120') (135')
RR BRIDGE (60')
6 HARD STANDINGS
BARRACKS BLDGS
PROB. MOTOR POOL & MOTOR REPAIRS BUILDINGS
DISPERSAL AREA 20 LYRATE DOUBLE REVETS.
POSSIBLE STORES
REVTD. STORES
HARD STANDINGS
WAREHOUSES OR STORES
LAKE
SEE MOSAIC "B"
AU-HIAP
REVETMENTS
SHOOTING IN BUTT
RANGE MARKERS
AIRCRAFT ASSEMBLY PLANT
T.166
NEW RESIDENTIAL AREA
RR BRIDGE (110')
MAIN LINE RR
KE-BUE-LUN
PROBABLE RADAR INSTALLATIONS
RR BRIDGE (120')
HWY BRIDGE (120')
E-W RUNWAY
N-S RUNWAY
L A/A POS. W/O GUNS
HANGARS
ADMIN., CONTROL & QUARTERS BLDG.
RADIO TOWERS
POSSIBLE STORES
NW-SE RUNWAY
NE-SW RUNWAY
RR BRIDGE (320')
REPORTED SUGAR REFINERY & ALCOHOL PLANT
T.168
TIAN-PO-K'E
HANGARS
APRON
DISPERSAL AREA 12 LYRATE, DOUBLE REVETMENTS
RR SIDINGS
PEQ-CHUJU-A
KYOSHITO
POSSIBLE STORES
GE-LI-NA
UNIDENTIFIED INSTALLATIONS
WAREHOUSES OR STORES
RR BRIDGE - 125'
STORES OR WAREHOUSES UNDER CONSTRUCTION
SU-LIONG
A/A BATTERY 3 GUNS
UNIDENTIFIED INSTALLATION
LE-TE-SUÃ
TSU-KUA
RR BRIDGE (230')
KAU-KAO-UI

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

OKAYAMA, FORMOSA

MOSAIC "A"

22° 47' 30" N 120° 15' E

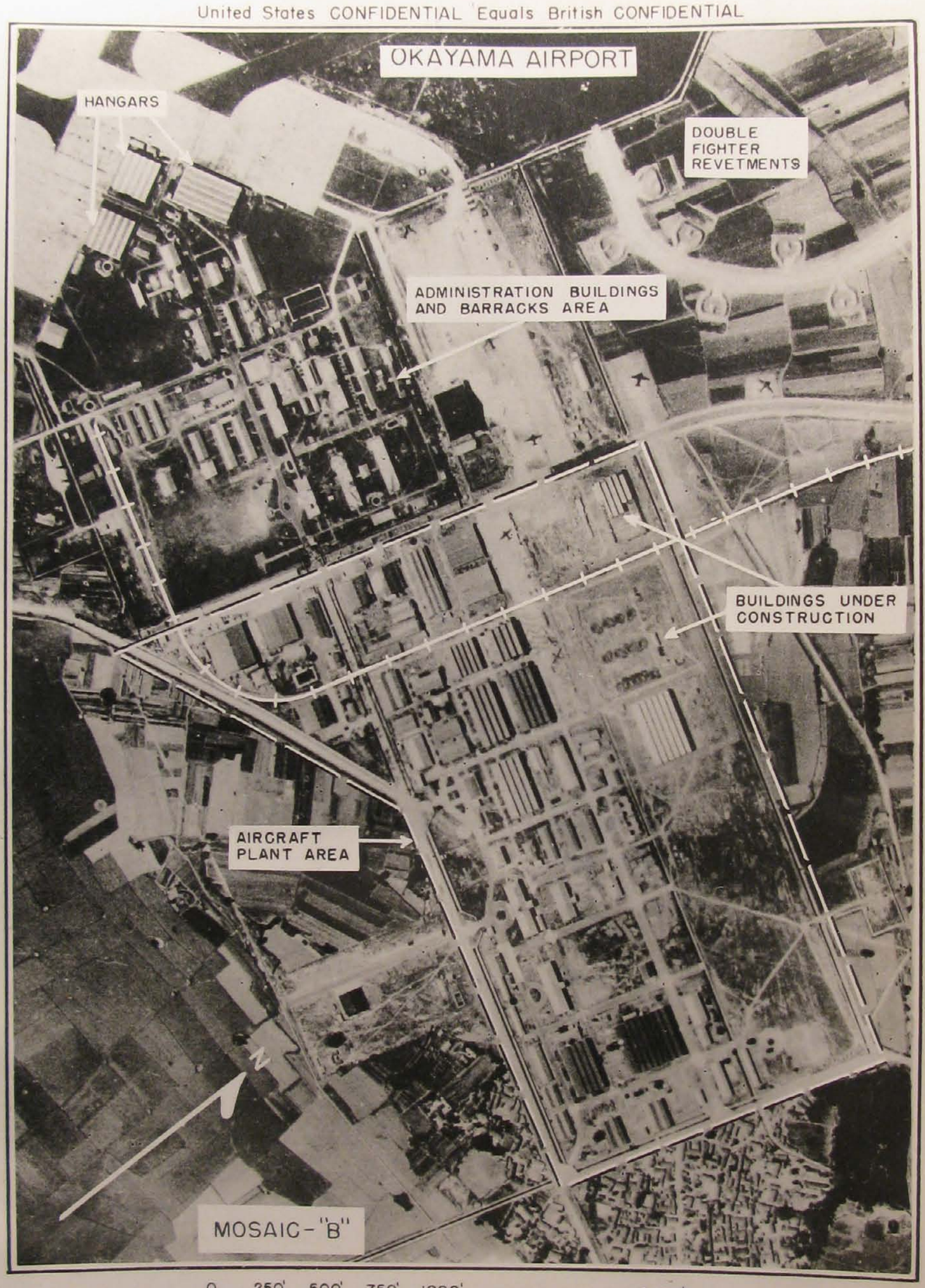
DATE OF PHOTOGRAPHY, 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0' 1000' 2000' 3000'

OFFICE OF THE AC/AS, INTELLIGENCE

RR BRIDGE (150')
6 HARD STANDINGS
PROB. MOTOR POOL & MOTOR REPAIRS BUILDINGS
DISPERSAL AREA 12 LYRATE, DOUBLE REVETS.
REVETMENTS
SHOOTING IN BUTT
RANGE MARKERS
E-W RUNWAY
N-S RUNWAY
NW-SE RUNWAY
NE-SW RUNWAY
POS. W/O GUNS
HANGARS
APRON
HANGARS
POSSIBLE STORES
WAREHOUSES OR STORES
STORES OR WAREHOUSES UNDER CONSTRUCTION
A/A BATTERY 3 GUNS
LE-TE-SUÃ
HWY BRIDGE
BARRACKS BLDGS
HARD STANDINGS
LAKE
SEE MOSAIC "B"
AU-HIAP
AIRCRAFT ASSEMBLY PLANT
T.166
ADMIN., CONTROL & QUARTERS BLDG.
RADIO TOWERS
POSSIBLE STORES
DISPERSAL AREA 12 LYRATE, DOUBLE REVETMENTS
RR BRIDGE - 125'
TSU-KUÃ
UNIDENTIFIED INSTALLATION
RR BRIDGE (230')
OKAYAMA
HWY BRIDGES (120') (135')
WAREHOUSES OR STORES
NEW RESIDENTIAL AREA
KE-BUE-LUN
PROBABLE RADAR INSTALLATIONS
TIAN-PO-K'E
GE-LI-NÃ
RR BRIDGE (60')
RR BRIDGE (110')
MAIN LINE RR
HWY BRIDGE (120')
RR BRIDGE (320')
RR BRIDGE (120')
REPORTED SUGAR REFINERY & ALCOHOL PLANT
T.168
RR SIDINGS
PEQ-CHOU-A
KYOSHITO
UNIDENTIFIED INSTALLATIONS
SU-LIONG
KAU-KAO-UI



OKAYAMA AIRCRAFT PLANT - TARGET 166
(Date: 7 Nov. 1943)

General plant layout and building types indicate that this may be a secondary assembly or a modification plant. Production activity is also indicated by extensive barracks and workers' quarters area to the east. Two-engine medium planes are parked near NE end of plant, but revetments on all sides of field are for small fighters. Several reconnaissance reports refer to over 100 fighters and 20-30 medium planes here, possibly indicating that field is primarily a fighter base.

TAKAO-HOZAN DISTRICT

(Reconnaissance Photo Coverage: 7 November 1943)

The Takao-Hozan district, including Toshien, ranks as the primary industrial and military zone in Formosa. Extensive military camps extend in an arc from Toshien, through north Takao to the south of Hozan. Takao is the industrial and transportation center.

TAKAO

1. Industry: Outstanding among Takao's industry is the Nippon Aluminum Company (Target 3), an integrated alumina/aluminum plant credited with about 10% of total Japanese Empire aluminum production. Its southern location has the advantage of short-haul bauxite transportation from Bintan Island near Singapore. Neutralization of this plant would lower significantly Japan's aluminum supply, and contribute to the further deterioration of her already stringent shipping position.

Among the other significant industrial plants revealed by available reconnaissance are: (a) a large cement works (Target 13); (b) a partially completed iron smelter; (c) an incomplete (apparently partly abandoned) oil refinery; (d) at least two chemical fertilizer plants; (e) two marine engine works, and several small machinery plants; (f) two large sugar/alcohol plants (Targets 6 and 172) and (g) at least three large unidentified plants which may include such previously reported plants as the Kokusan Automobile Works, the Minami Nippon K.K. magnesium works, a chlorine plant and a gunpowder plant of Nippon Kayaku Seizo.

The bulk of Takao's power supply is derived from the Lake Jitsugetsutan hydroelectric development by way of the transformer station (Target 164) to the north of the city. This station is an important alternate objective for depriving the Takao area, at least temporarily, of this power supply. A small steam power station, Target 177, in the northern part of the city could not supply sufficient power by itself to meet even the minimum demands of Takao's industries. Reports that a 35,000 KW steam plant had been constructed on the N/S inlet near the entrance to Takao Harbor cannot be verified by available reconnaissance photography.

2. Harbor Facilities: Second only to Keelung in volume of peacetime shipping, Takao has probably equaled -- if not surpassed -- the former as a result of the necessity for convoying shipping. Principal commodities handled are:

Imports:	Exports:
All types of manufactured products (machinery, metal products), textiles, raw sugar (coastal shipments), bauxite, coal (coastal shipments), oil, military supplies.	Refined sugar, salt, cement, alcohol, fruits and fish, lumber. Military supplies and troops.

The port's warehouse capacity greatly exceeds normal commodity requirements, and it is likely that most are used exclusively for military purposes. The main wharves are equipped with modern, heavy-duty loading equipment which permits rapid convoy loading. The extensive railroad yard, equipped with a roundhouse and large repair shops (Target 9) is an integral part of the harbor facilities and constitutes an objective of equal priority. Reconnaissance indicates that this yard is frequently congested with 400-500 RR cars.

Of even greater significance, perhaps, are the ship concentrations themselves. Japan's tight shipping position makes all ship concentrations important, but they assume added importance here because:

(1) this is part of the convoy system which directly supports the southern theaters and

(2) the harbor is so restricted that it might be blocked for some time as a result of the sinking of several ships alongside wharves or in the narrow channel. As indicated by the reconnaissance photographs which follow, ships not berthed alongside wharves must be moored two abreast along the harbor channel.

Although the Kigo Lagoon extends for some 8 miles in a NW/SE direction, only the 3/4 mile wide stretch parallel to the main wharves is useable by large vessels. Ships of 10,000 tons or more can not use the inner harbor and must anchor in the outer harbor, just north of the breakwaters.

Reconnaissance reveals two shipyards (Targets 7 and 175) with a total of about 33 slipways and/or patent slips, ranging in length from 50 to 150 feet. These yards are probably building standardized wooden cargo vessels in addition to smaller fishing boats and patrol craft. A large lumber mill, on the Takao River to the north of the city, probably supplies most of the wood. A graving dock, about 300 feet long is located at the east end of the main wharf. Two patent slips leading into repair sheds south of the Reigaryo Shipyard may be used for repairs to small submarines. A 2000 foot N/S inlet near the entrance to the harbor is used as a base for barges and fishing boats. A small boat basin has been built into the small wharf to the west of the main wharves. This wharf (Target 173), equipped with 30 small storehouses, was utilized in peacetime for the Takao-Pescadores ferry service.

3. Military Installations: Takao city is the center of a strongly fortified zone and numerous A/A and C/D guns are noted on the attached reconnaissance photographs. Revetted and underground munitions depots are located on the Kigo Peninsula, Ape hill and in the Reigaryo area, south of Takao Proper. An especially extensive concentration of military storehouses and munitions depots (Target 176) is located in the Reigaryo district. Several groups of military barracks are located to the south of the railroad station in the northern outskirts of the city. Other military quarters are located in the Reigaryo district.

The large Reigaryo Airport, (also known as the Hozan airport) reported to be a bomber training base, is located about 5 miles SE of the city. A very extensive munitions dump, consisting of about 110 small revetted buildings covering an area of 120 acres, is located about 1/2 mile west by north of this airport. The small Reigaryo seaplane station is located on the Kigo Lagoon, about 2 miles west of the airfield.

4. Incendiary Attack: While Formosan cities are generally not as vulnerable to fire as are typical Japanese cities (because of the higher proportion of brick used in construction), Takao is an exception. Although the city is well-laid out, with numerous secondary firebreaks, the triangular central section (bounded on the south by the main wharf, on the west by the railroad yard and on the east by the Takao River) is predominantly a Japanese residential district with typical Japanese construction and congestion. The southern part of this area is congested

with warehouses (most of easily penetrable wood or sheet metal over steel frame construction) the contents of which are probably combustible. Other areas for incendiary attack are the village and shipyards on the tip of the Kigo Peninsula and the extensive Reigaryo military stores (Target 176).

TOSHIEN

First reported in 1938, a naval base under construction at Toshien appears to be nearing completion. Three 50 by 275 foot drydocks have been completed (Target 56), one of which is being lengthened. Six large basins are being dredged at the north end of the lagoon. Several munitions storages, including a buried fuel and munitions depot (Target 178), have been constructed at the northern end of Ape Hill. A group of 18 fuel tank emplacements is under construction at the foot of a ridge, about $3\frac{1}{2}$ miles NE of the Ape Hill depot. An extensive barracks and workers' quarters district, with some 700 small buildings, is situated just NW of the village of Toshien.

Incomplete reconnaissance coverage precludes a final evaluation, but it is believed that this naval base is not yet operational on a significant scale. Lack of ship activity, unused drydocks and the many evidences of large-scale construction work indicate that the base may not become fully operational for some time. With the decreased use of the Mako Naval Base in the Pescadores and the shift of the base headquarters to Takao, however, the Toshien Naval Base has considerable potential importance.

HOZAN

(See Also 1st Mosaic In Next Section)

The Hozan district is important primarily as a military storage area and a concentration point for troops about to be embarked from Takao. In addition to the main embarkation camp (Target 179), which covers an area of 2 miles by 1800 feet, there are numerous small barracks areas on all sides of the town. Two large supply depots are located east and west of the town and a probable munitions depot is located in a hilly region SE of the embarkation camp. An extensive underground storage area is located in a hilly region, about 4 miles north of Hozan.

The Hozan W/T Station, one of the most powerful transmitters in the Japanese Empire, is south of the Hozan-Heito RR about one mile east of the town. It is reported to comprise a camouflaged station building, one very high center tower (over 200 ft.) and 15-16 smaller towers arranged in a circle about the center tower.

TABULATION OF TARGETS

No.	Name	Approximate Coordinates	Description and Significance
3	Nippon Aluminum Co. (Takao)	22° 37' N 120° 17' E	Large integrated alumina/aluminum plant, credited with 10.5% alumina and 9.5% aluminum in terms of total Jap capacity. Closely-spaced bldgs. Alumina works occupy central part of compound; aluminum pot rooms are on N & E sides with adjacent rectifier units; SW part of compound may be devoted to some kind of fabrication.

TABULATION OF TARGETS (Cont'd.)

No.	Name	Approximate Coordinates	Description and Significance
13	Asano Cement Plant (Takao)	22° 39' N 120° 16' E	Formosa's only large cement works; output important for airport, road and military construction.
6	Industrial Alcohol Plant (Ensuiko Seito K.K.) (Takao)	22° 37' N 120° 17' E	Large alcohol plant, can produce absolute alcohol. Note: The Taiwan Iron Works, which builds and repairs sugar refinery machinery, is located just N of alcohol plant.
172	Reigaryo Sugar/ Alcohol Plant (Takao)	22° 34' N 120° 19' E	New sugar/alcohol plant, appears to have large capacity.
8a	Military Storehouses & Main Wharf (Takao)	22° 37' N 120° 17' E	4,350 ft. main wharf, can berth 8 ships. Equipped with RR spurs, about 5 traveling and 2 fixed cranes; cold storage plant, graving dock & oil pipelines at E end; oil & water tanks at W end. Small boat chamber N of wharf. About 75 storehouses (on main wharf & along small boat chamber), ranging from 50 by 100 ft. to 100 by 300 ft. Most buildings are sheet metal over steel frame; a few are concrete or wood.
8b	Takao River Wharves (Takao)	22° 37' N 120° 19' E	2000 ft. wharf on E side, equipped with two 100 by 300 ft. warehouses. Two berths on W side with 7 warehouses. Probably handle cargoes for Takao industries.
173	Western Wharf (Takao)	22° 37' N 120° 16' E	Small boat basin and about 30 storehouses (ranging from 25 by 100 ft. to 60 by 400 ft.); probably used for fish and general stores of Takao-Pescadores ferry service.
9	Railroad Yard & Repair Shops (Takao)	22° 38' N 120° 16' E	Extensive freight yard serving port area. Roundhouse and sheds at S end; repair shops at N end. Up to 400-500 RR cars may be found in the yard.
174	Takao RR Station (Takao)	22° 38' N 120° 17' E	Main station, with 750 ft. main building at W end, roundhouse and turntable at E end & troop barracks to south.
164	Takao Substation	22° 39' N 120° 17' E	Large transformer station, marked by characteristic open-air switchgear, which controls all power entering Takao from Lake Jitsugetsutan. "L"-shaped transformer house in SE corner.

TABULATION OF TARGETS (Cont'd.)

No.	Name	Approximate Coordinates	Description and Significance
177	North Takao Steam Power Plant	22° 38' N 120° 16' E	13,000 KW; construction unknown.
4	Mitsubishi Oil Storage (Takao)	22° 37' N 120° 17' E	Two groups of 3 fuel tanks each, camouflaged. Small carbonic acid plant between tanks. 4 conspicuous tanks, believed to be holders for natural gas piped from gas fields to N, located just E of oil tanks.
7	Kigo Naval Dock-Yard (Takao)	22° 37' N 120° 16' E	Former naval dockyard, now probably building fishing vessels, patrol boats & standardized wooden cargo vessels. 3 slipways (100 to 150 ft.) at small yard near harbor entrance. About 20 slipways & patent slips (50 to 150 ft.) at main yard in central boat basin. Ohba Marine engine works at SE corner of basin. Other shops scattered along waterfront. Note: 10 large warehouses (probably for munitions) at NW corner of new basin being constructed SE of naval dockyard.
175	Reigaryo Shipyard (Takao)	22° 37' N 120° 18' E	New shipyard, equipped with 8 slipways (150 ft.), probably builds standardized wooden cargo vessels. Several large shop buildings (probably include marine engine works) to E of slipways. Two patent slips (to S of slipways) lead into two 75 by 175 ft. repair sheds. These may be used for repairs to small submarines.
176	Reigaryo Military Stores (Takao)	22° 36' N 120° 19' E	Three groups of military supply warehouses & munitions stores; over 230 buildings varying from 35 by 60 ft. to 40 by 350 ft. Bldgs in SW group are very closely spaced & are probably vulnerable to incendiaries. Note: Three large unidentified factories adjoin this target area.
56	Toshien Dockyard (Toshien)	22° 41' N 120° 16' E	Naval dockyard under construction. Three 50 by 275 ft. drydocks completed (one being lengthened), numerous shops, etc. bldgs under construction. Extensive personnel barracks area to E of harbor.
178	Toshien Fuel & Munitions Depot (Toshien)	22° 40' N 120° 17' E	Two 250 ft. diameter buried fuel tanks on N slope of Ape Hill. Underground munitions storage & supply dump at foot of hill. Revetted munitions stores on crest of hill, S of buried tanks.
179	Hozan Embarkation Camp	22° 37' N 120° 21' E	Large mil camp, about 2 mi. N/S by 1800 ft. E-W; probably an embarkation camp. Note: Other barracks areas & storage depots on all sides of town.

TAKAO AREA, FORMOSA
22° 38' N - 120° 19' E
Date: 7 Nov. 1943

APPROXIMATE SCALE

0 1/4 1/2 3/4 1 2

STATUTE MILES


HEITO
(2 r
SHIMO TAMSUI
RIVER
BRIDGE
T. 55
MOSAIC-"D"
H ZAN
REIGARYO
AIRPORT
MUN
DE
PROBABLE
WATER RESERVOIRS
UNIDENTIFIED
STORAGES
TOSHIEN
TAKAO
INNER
HARBOR
KIGO PEN
APE
HILL
MOSAIC-"A"
OUTER
HARBOR
MOSAIC-"B"
TAKAO AREA
22° 38' N -
Date: 7 No
APPROXIMATE
0 1/4 1/2 3/4 1
STATUTE

TO TAINAN (25 MI.)

N

BARRACKS, WORKERS QUARTERS, ETC.

TOSHIEN

POWER LINE FROM LAKE JITSUGETSUTAN

UNIDENTIFIED MILITARY INSTALLATION

TRANSFORMER STATION

T.164

RADIO STATION

LUMBER PLANT

BRICK PLANT

BRIDGE

PROB. ADMIN. & QTRS. AREA

DREDGER

SUPPLY DUMP

UNDGR. STORAGE

T.178

2 BURIED FUEL STORAGE TANKS

PROB. SUPPLY BLDGS. AREA

TOSHIEN HARBOR

DRYDOCKS
FLOATING CRANES
DRYDOCK

MUNITIONS STORAGE

T.56

T.13

CEMENT PLANT

QUARRY

PROB. NAVAL BASE UNDER CONSTR.

APE HILL

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

N

POWER LINE FROM
LAKE JITSUGETSUTAN

UNIDENTIFIED MILITARY
INSTALLATION

TRANSFORMER
STATION

T.164

RADIO STATION

UNDGR. STORAGE

T.178

2 BURIED
FUEL STORAGE TANKS

MUNITIONS
STORAGE

APE HILL

T.13

CEMENT PLANT

QUARRY

LUMBER
PLANT

BRICK
PLANT

BRIDGE

TO HOZAN

ROUNDHOUSE
& T. TABLE

T.174

R.R.
STATION

MILITARY BARRACKS

UNIDENTIFIED MIL.
INSTALLATION

POWER
PLANT

T.177

CHEMICAL
FERTILIZER
PLANT

CAMOUFLAGED
FUEL STORAGE TANKS

T.4

BRIDGE

TAKAO

R.R. SHOPS

IRON
WORKS

ALCOHOL PLANT

T.6

T.9

REPORTED WATER TANKS

FUEL STORAGE TANKS

ROUNDHOUSES

SHRINE

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

TO HOZAN

ROUNDHOUSE & T. TABLE

MILITARY BARRACKS

T.174

ITIFIED MILITARY
LLATION

R. R. STATION

TRANSFORMER STATION

T.164

PROB. IRON SMELTER UNDER CONSTRUCTION

2 INDUSTRIAL PLANTS (UNIDENTIFIED)

UNIDENTIFIED MIL. INSTALLATION

PROB. NATURAL GAS HOLDERS

INDUSTRIAL PLANT (UNIDENTIFIED)

COAL DUMP

LUMBER PLANT

CAMOUFLAGED FUEL STORAGE TANKS

T.4

BRICK PLANT

POWER PLANT

T.177

CHEMICAL FERTILIZER PLANT

BRIDGE

ALUMINUM PLANT

T.3

2 INDUSTRIAL PLANTS (UNIDENTIFIED)

BRIDGE

BAUXITE STORAGE

REPORTED CARBONIC ACID PLANT

REPORTED COLD STORAGE PLANT

TAKAO

T.13

CEMENT PLANT

R.R. SHOPS

IRON WORKS

ALCOHOL PLANT

T.6

QUARRY

T.9

REPORTED WATER TANKS

FUEL STORAGE TANKS

SHRINE

ROUNDHOUSES

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

TAKAO, FORMOSA

MOSAIC "A"

22° 38' N. - 123° 17' E.

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE


SEI
OUTER HARBOR
HI BAY
INNER HARBOR
GUN POSITION
4 C/D-7 A/A
APE HILL
PROBABLE MILITARY SUPPLIES
MILITARY BARRACKS
MILITARY HOSPITAL
FISHING FLEET ANCHORAGE
BREAKWATER
BEACON
BREAKWATER
GUN POSITION
3 C/D-2 POSSIBLE D/P
KIGO
HIGHWAY BRIDGE
TAKAO RIVER
HIGHWAY BRIDGE
TAKAO
HIGHWAY BRIDGE
WAREHOUSE AREA
WAREHOUSE AREA
CAMOUFLAGED BUILDINGS
CUSTOMS
WAREHOUSE AREA
T.8a
T.8b
2 BERTHS
TAKAO RIVER BASIN
WAREHOUSE AREA
SMALL BOAT BASINS
T.173
WAREHOUSE AREA
CAMBER FOR JUNKS & LIGHTERS
GRAVING DOCK
REPORTED COLD STORAGE PLANT
CAMOUFLAGED OIL TANKS
T.4
SMALL BOAT BASINS
FLOATING CRANE
MILITARY BARRACKS
KIGO SHIPYARD
T.7
REIGARYO SHIPYARD
T.175
TWO PATENT SLIPS
PROBABLE MUNITIONS WAREHOUSE AREA
GUN POSITION
4 H A/A OR D/P
PROBABLE MILITARY SUPPLY WAREHOUSE AREA
N

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BRITISH CONFIDENTIAL

TAKAO, FORMOSA

MOSAIC "B"

22° 37' N. - 120° 17' E.

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

GUN POSITION
4 C/D-7 A/A

TARY
PITAL

BREAKWATER

PROBABLE MILITARY SUPPLIES

APE HILL

MILITARY BARRACKS

FISHING FLEET ANCHORAGE

CUSTOMS

WAREHOUSE AREA

SMALL BOAT BASINS

T.173

HIGHWAY BRIDGE

TAKAO RIVER

HIGHWAY BRIDGE

TAKAO

HIGHWAY BRIDGE

WAREHOUSE AREA

WAREHOUSE AREA

CAMOUFLAGED BUILDINGS

T.8a

T.8b

2 BERTHS

TAKAO RIVER BASIN

WAREHOUSE AREA

WAREHOUSE AREA

CAMOUFLAGED OIL TANKS

T.4

CAMBER FOR JUNKS & LIGHTERS

GRAVING DOCK

REPORTED COLD STORAGE PLANT

INNER HARBOR

BREAKWATER

KIGO

POSITION
- 2 POSSIBLE
D/P

SMALL BOAT BASINS

FLOATING CRANE

MILITARY BARRACKS

KIGO SHIPYARD

T.7

REIGARYO SHIPYARD

T.175

TWO PATENT SLIPS

PROBABLE MUNITIONS WAREHOUSE AREA

GUN POSITION
4 H A/A OR D/P

PROBABLE MILITARY SUPPLY WAREHOUSE AREA

MILITARY BARRACKS

PROBABLE MILITARY SUPPLY WAREHOUSE AREA

T.176

PROBABLE MILITARY SUPPLY WAREHOUSE AREA

T.176

PROBABLE MILITARY SUPPLY WAREHOUSE AREA

T.176

SEE ALSO MOSAIC "B 1"

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

TAKAO, FORMOSA

MOSAIC "B"

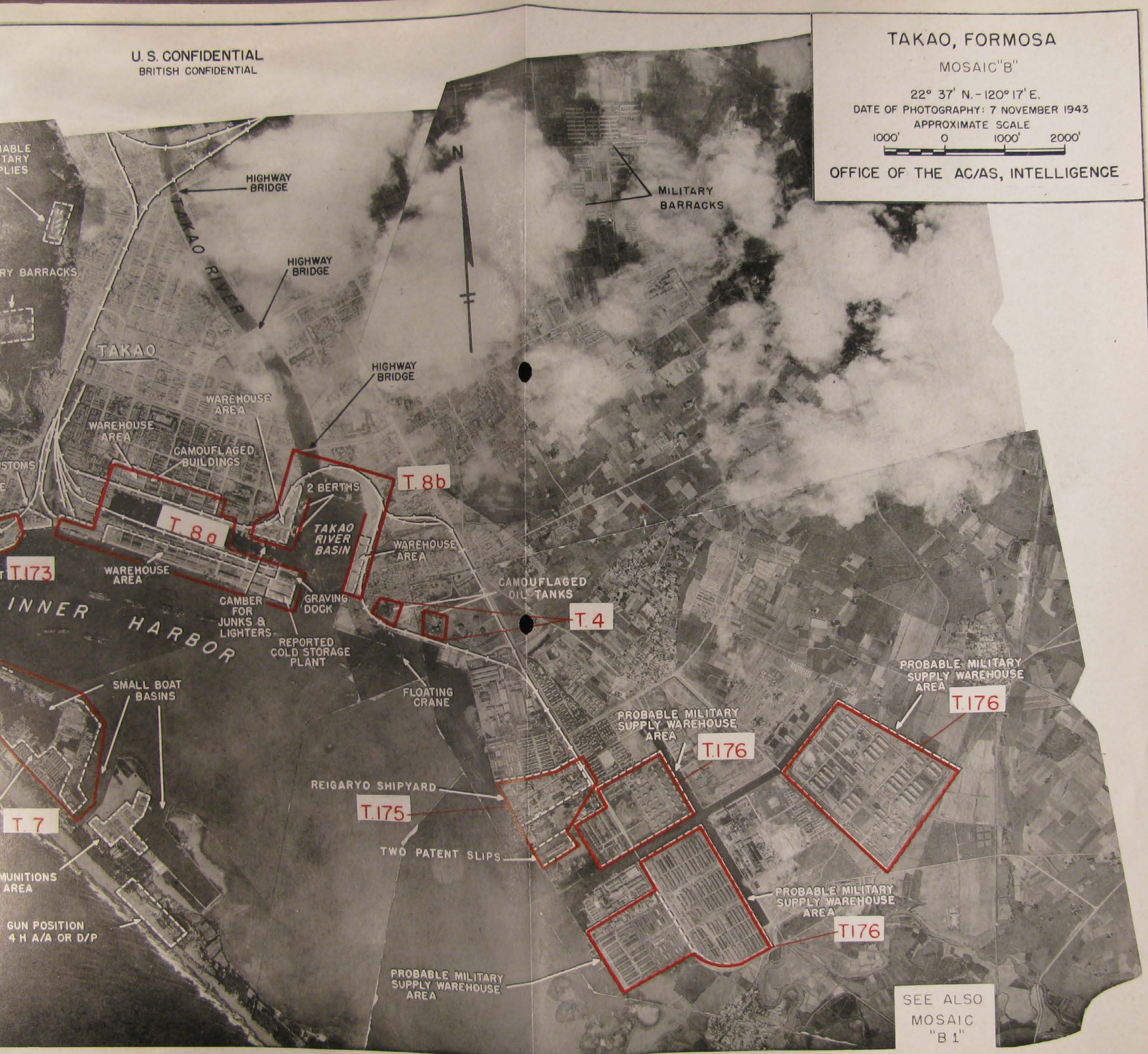
22° 37' N. - 120° 17' E.

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

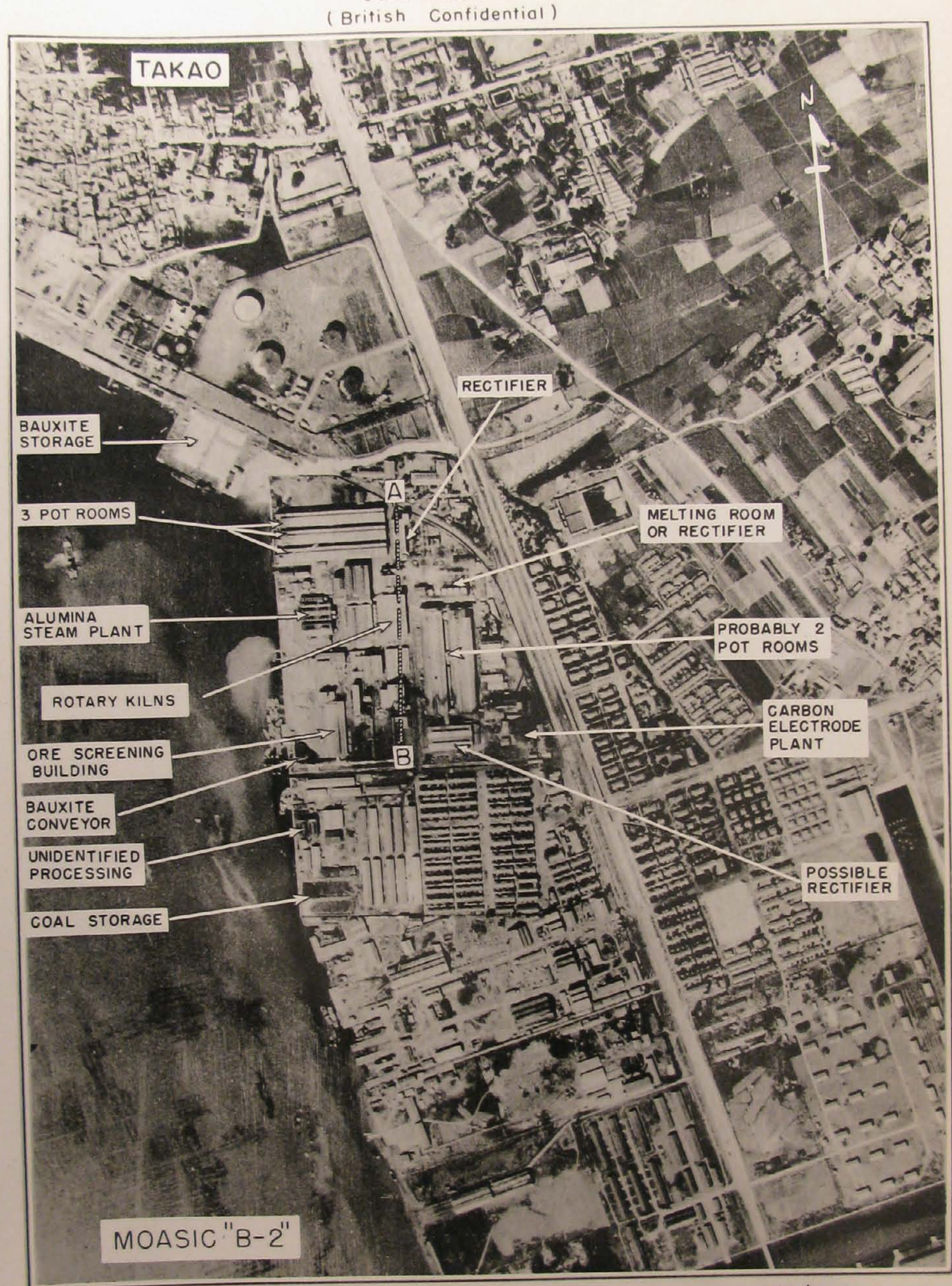


SEE ALSO MOSAIC "B 1"

REIGARYO DISTRICT
OF
TAKAO

DETAIL OF UNIDENTIFIED FACTORIES
MOSAIC-"B 1"
Date: 7 Nov. 1943

0 250' 500' 750' 1000' 2000'
APPROXIMATE SCALE



NIPPON ALUMINUM CO. - TARGET 3
(Date: 7 Nov. 1943)

Integrated alumina/aluminum plant, credited with about 10% of total Japanese capacity. The two long buildings at the right are believed to be pot rooms, but they may be a rolling mill. The line A--B indicates a vital part of the target area; the rotary kilns constitute a good aiming point.

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BRITISH CONFIDENTIAL

REIGARYO

T.176

MILITARY STORES

IRON SMELTER UNDER CONSTRUCTION

GUN POSITION
4 H. A/A
6 L. A/A W/O GUNS

UNIDENTIFIED FACTORIES

TAKAO

PROB. MUNITIONS DUMP

UNIDENTIFIED MILITARY INSTALLATION

UNIDENTIFIED MILITARY INSTALLATION

REIGARYO SEAPLANE STATION

PROB. ABANDONED OIL REFINERY

KIGO

LAGOO

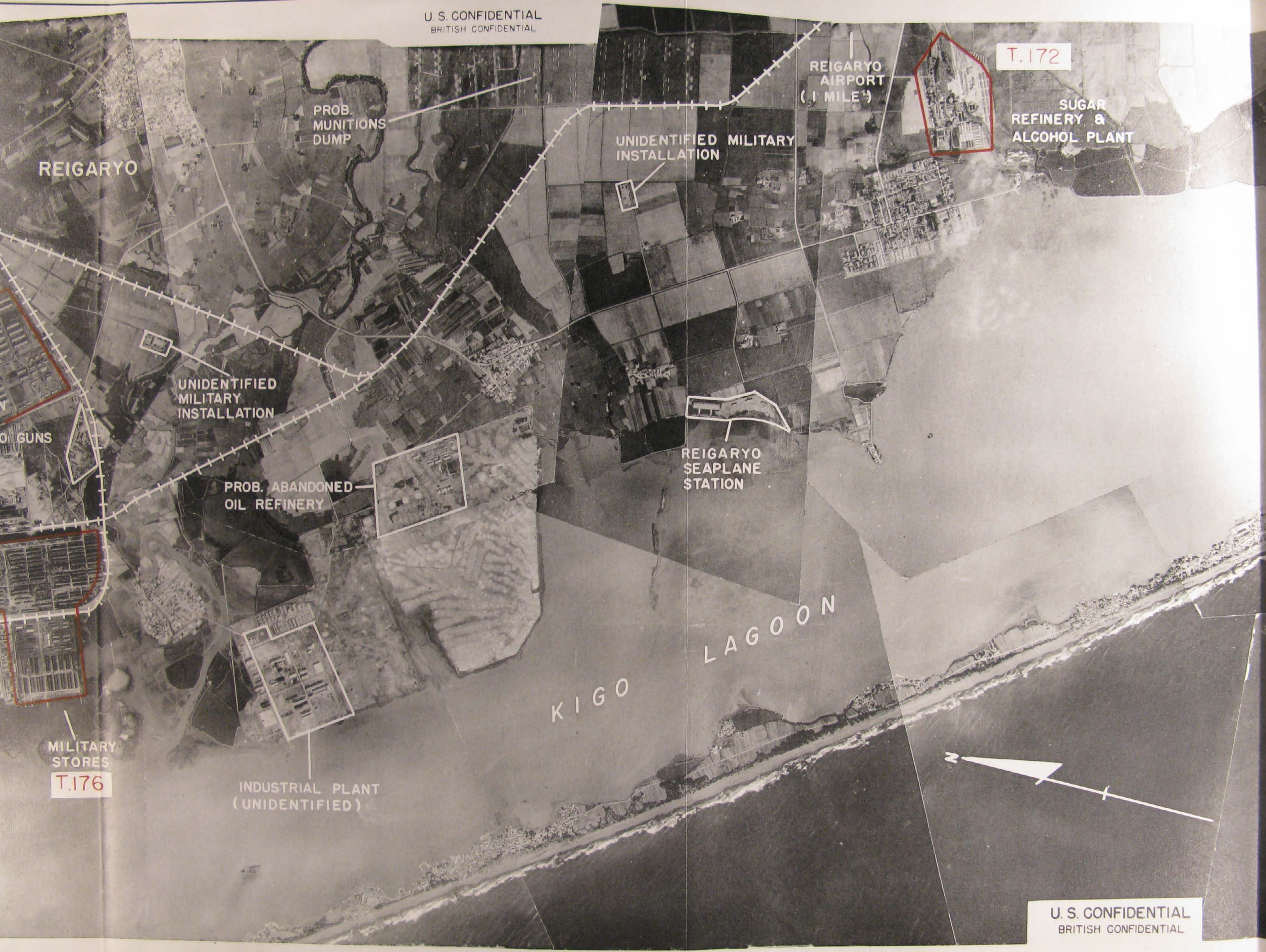
UNIDENTIFIED FACTORIES

MILITARY STORES

T.176

INDUSTRIAL PLANT (UNIDENTIFIED)

SEE PRECEDING MOSAICS FOR INSTALLATIONS IN THIS AREA


REIGARYO
PROB. MUNITIONS DUMP
UNIDENTIFIED MILITARY INSTALLATION
REIGARYO AIRPORT (1 MILE)
T.172
SUGAR REFINERY & ALCOHOL PLANT
UNIDENTIFIED MILITARY INSTALLATION
REIGARYO SEAPLANE STATION
PROB. ABANDONED OIL REFINERY
MILITARY STORES
T.176
INDUSTRIAL PLANT (UNIDENTIFIED)
KIGO
LAGOON
N

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

SEE ALSO MOSAIC "B-1"

TAKAO, FORMOSA

MOSAIC-"C"

22° 34' N.-120° 19' E.

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

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BRITISH CONFIDENTIAL

MILITARY BARRACKS

RR STATION

UNIDENTIFIED MILITARY INSTALLATION

MILITARY BARRACKS

HOZAN

PROBABLE MILITARY SUPPLIES DEPOT

TAKAO

HOZAN W/T STATION

PROBABLE MILITARY SUPPLIES DEPOT

MILITARY CAMP

MILITARY BARRACKS

T.179

N

UNIDENTIFIED MILITARY INSTALLATIONS

4 H A/A W/O GUNS

MILITARY SUPPLIES DEPOT

HOZAN, FORMOSA

MOSAIC – "D"

22° 37' N. – 120° 21' E.

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

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BRITISH CONFIDENTIAL

HEITO DISTRICT

(Reconnaissance Photo Coverage: 20 and 22 December 1943)

Heito is important primarily as a military zone. The Heito Airport (Target 57) is a large, well-equipped field. Its facilities include a secondary air depot, where some last-phase modification or minor assembly is done. Between the airport and Heito Proper are several groups of barracks and military schools. Other small barracks areas -- occupying converted school compounds -- are scattered throughout the town.

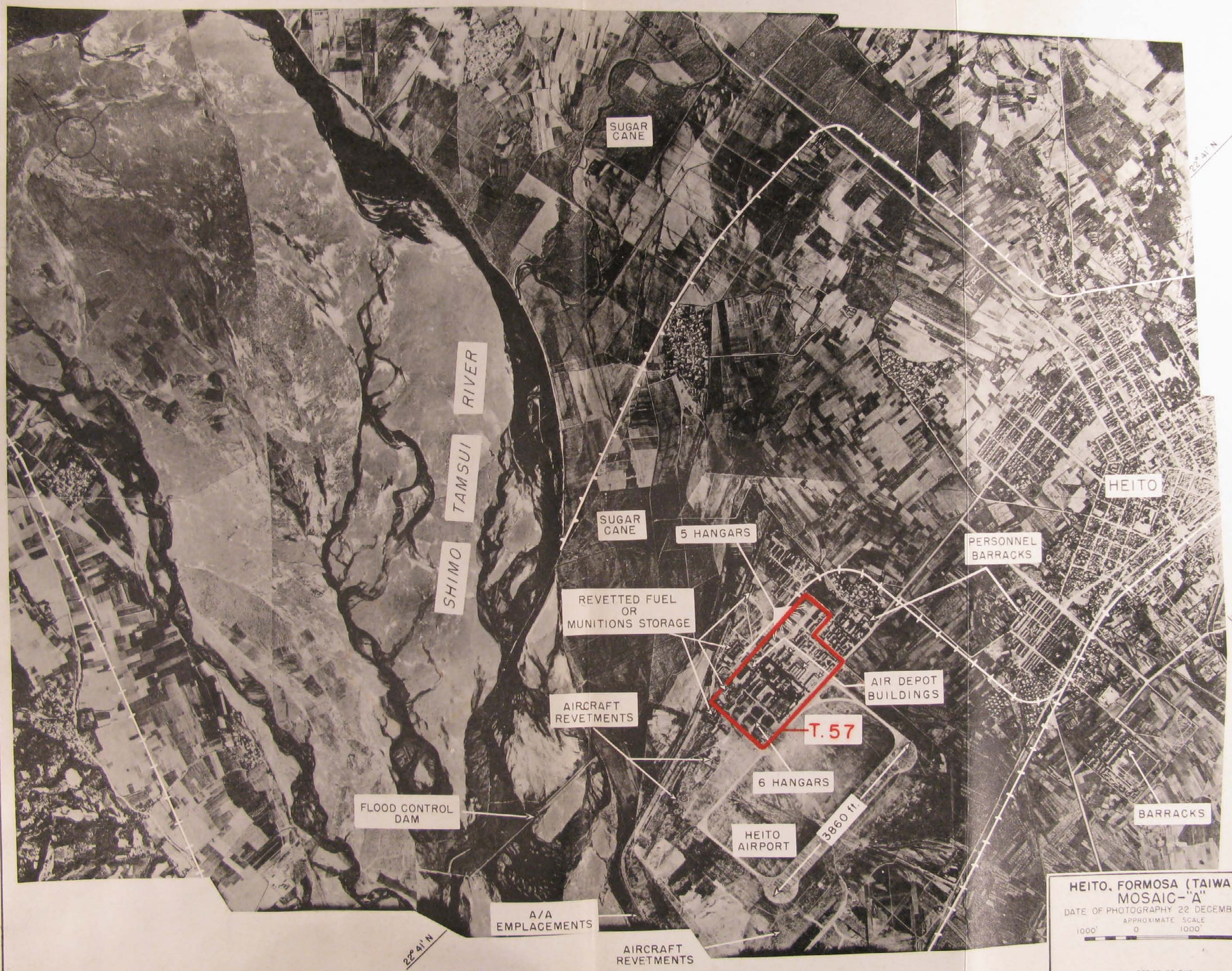
The only significant industry is a large sugar and alcohol plant (Target 180), located to the south of the town. A sizeable factory, not identified, is located at the eastern outskirts of the city and a small brick plant to the south.

A prison-like barracks area, covering some 7 acres, is located about 4 miles east of the town. The camp comprises some 30 buildings in all, and the compound is enclosed by two high walls. While confirming evidence is lacking, it is possible that this may be the Allied prisoner of war camp which has been reported in this vicinity.

The only other significant objective in this vicinity is the 5,000 foot steel girder RR bridge (Target 55) over the Shimo Tamsui River, one of the four critical points on the N/S trunk line.

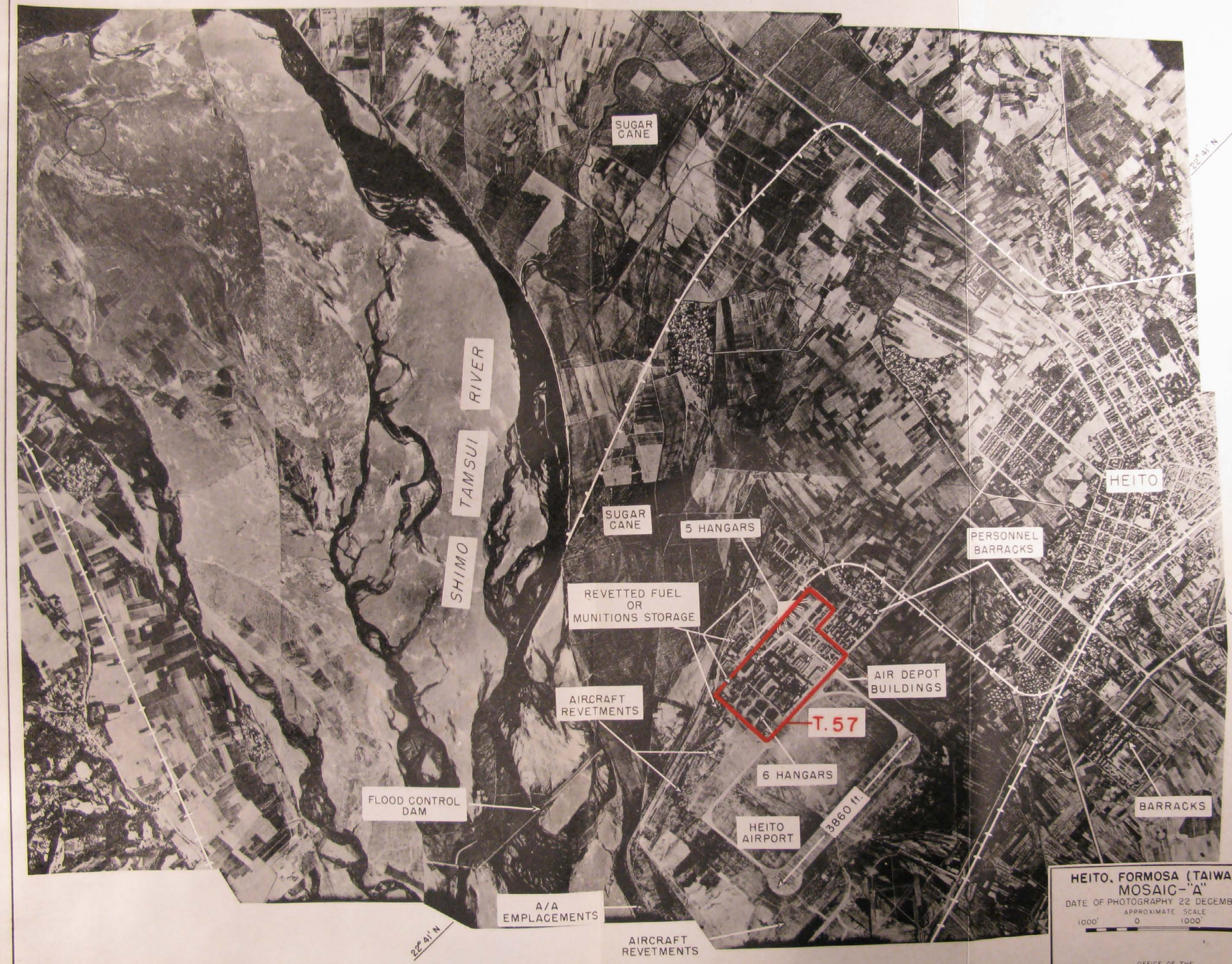
TARGET TABULATION

No.	Name	Approximate Coordinates	Description and Significance
57	Heito Airport	22° 41' N 120° 27' E	Branch air depot at field. See Airport Survey, Tab XV.
55	Shimo Tamsui RR Bridge	22° 40' N 120° 26' E	5000 ft. steel girder bridge.
180	Heito Sugar and Alcohol Plant (Taiwan Seito K.K.)	22° 39' N 120° 29' E	Credited with 15,000 gal. annual alcohol capacity. Plant buildings occupy area of 2100 ft. by 1500 ft.



HEITO, FORMOSA (TAIWAN)
MOSAIC-"A"
DATE OF PHOTOGRAPHY 22 DECEMBER 1943
APPROXIMATE SCALE
1000' 0 1000' 2000'

OFFICE OF THE
ASST. C/AS, INTELLIGENCE
W-990



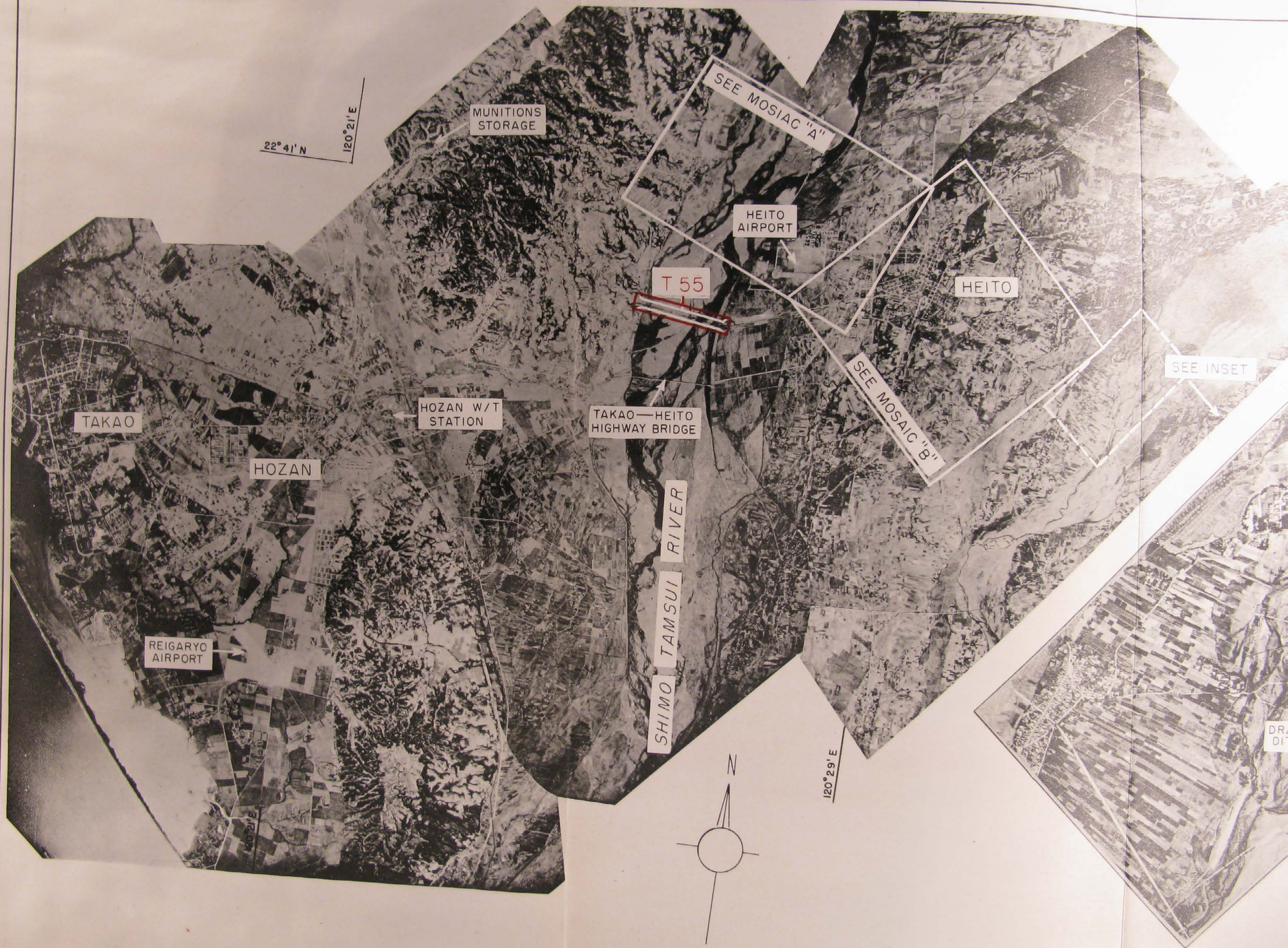
HEITO, FORMOSA (TAIWAN)
MOSAIC-"A"
DATE OF PHOTOGRAPHY 22 DECEMBER 1943
APPROXIMATE SCALE
1000' 0 1000' 2000'

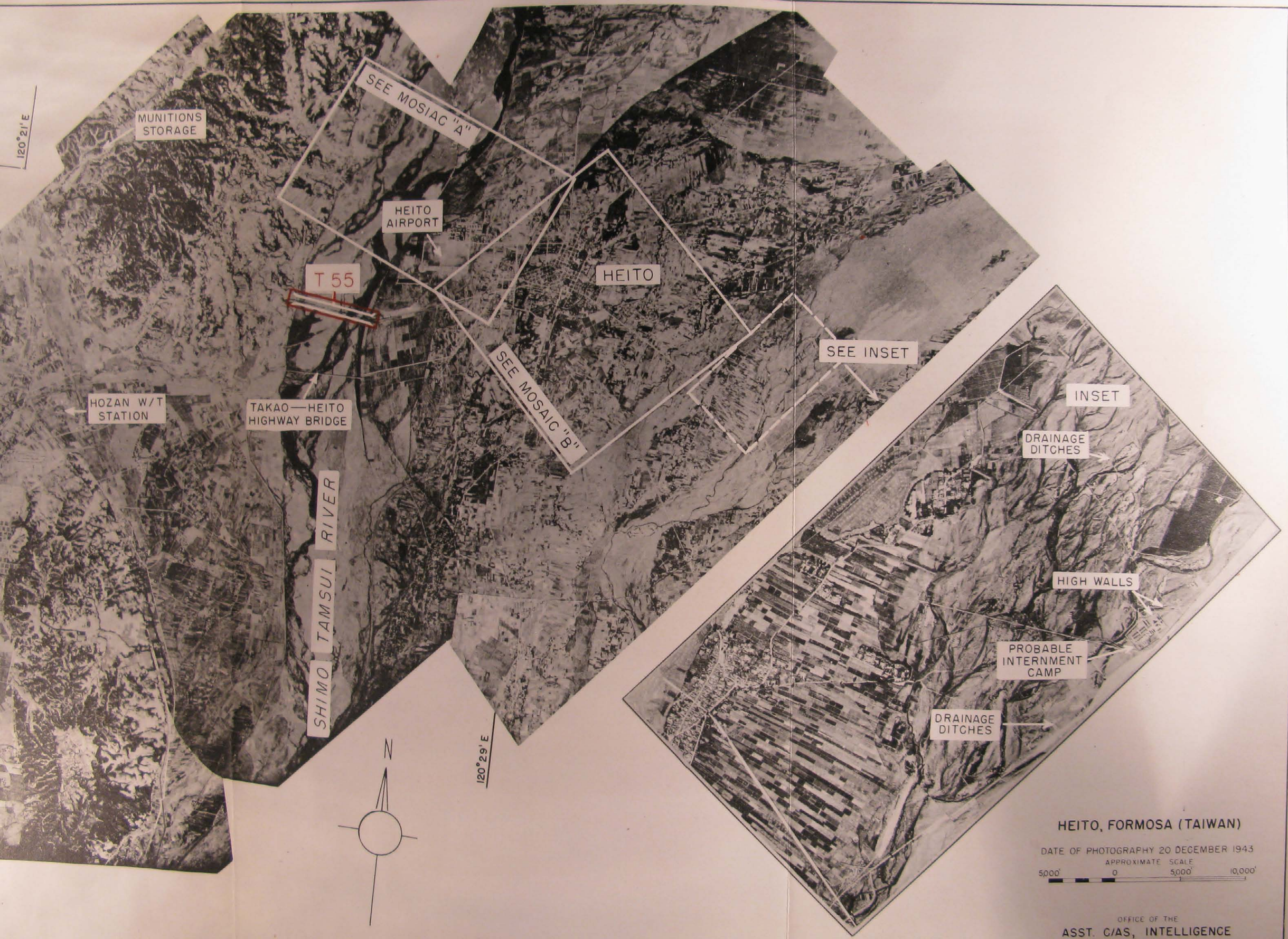
OFFICE OF THE
ASST. C/AS, INTELLIGENCE
W-990

HEITO, FORMOSA (TAIWAN)
MOSAIC-"A"
DATE OF PHOTOGRAPHY 22 DECEMBER 1943
APPROXIMATE SCALE
1000' 0 1000' 2000'

OFFICE OF THE
ASST. C/AS, INTELLIGENCE
W-990

CONFIDENTIAL
(British Confidential)





HEITO, FORMOSA (TAIWAN)

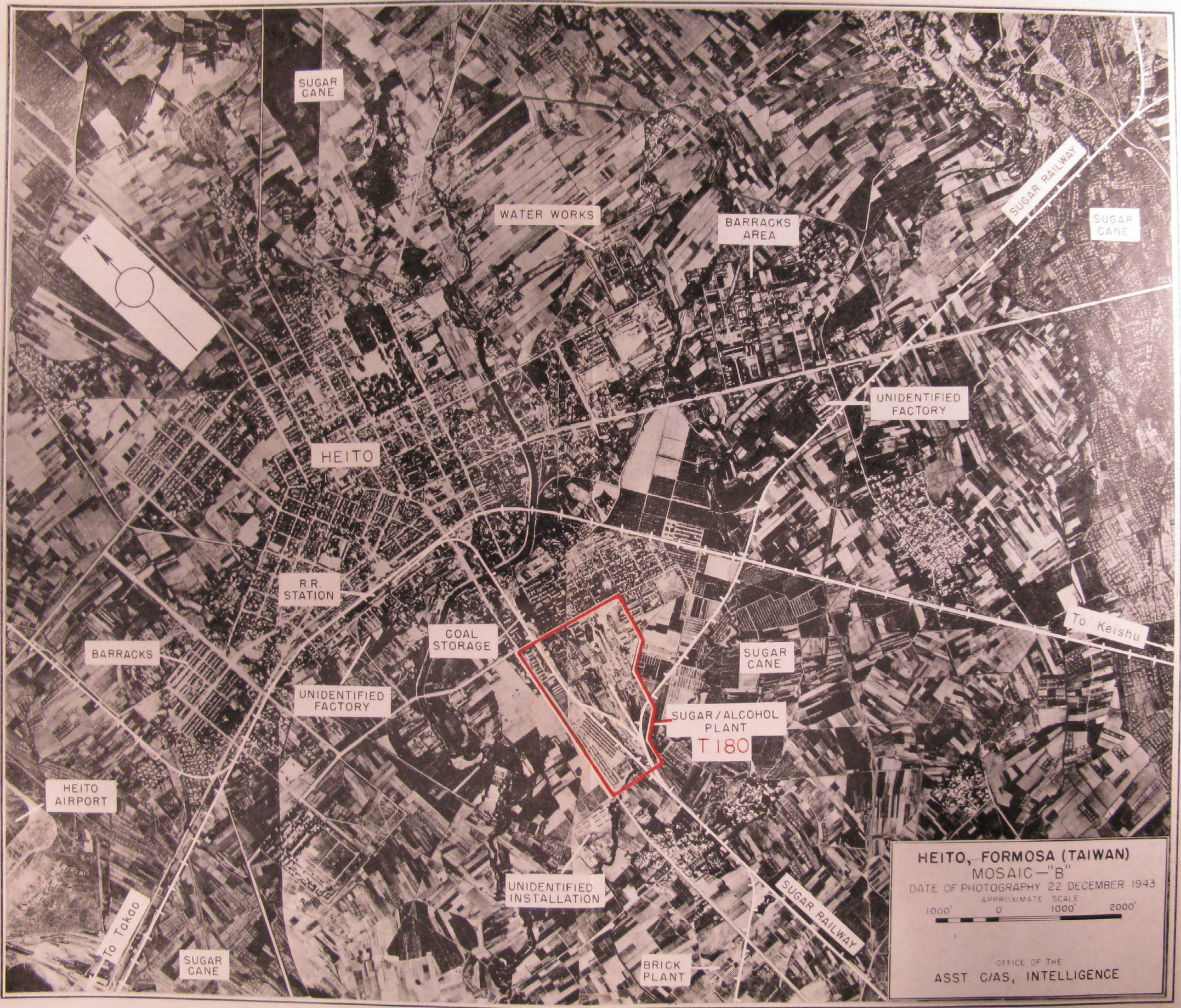
DATE OF PHOTOGRAPHY 20 DECEMBER 1943

APPROXIMATE SCALE

5,000' 0 5,000' 10,000'

OFFICE OF THE
ASST. C/AS, INTELLIGENCE

W-991


SUGAR CANE
WATER WORKS
BARRACKS AREA
SUGAR RAILWAY
SUGAR CANE
N
HEITO
UNIDENTIFIED FACTORY
R.R. STATION
COAL STORAGE
BARRACKS
UNIDENTIFIED FACTORY
SUGAR CANE
To Keishu
SUGAR / ALCOHOL PLANT
T.180
HEITO AIRPORT
UNIDENTIFIED INSTALLATION
SUGAR RAILWAY
To Takao
SUGAR CANE
BRICK PLANT
HEITO, FORMOSA (TAIWAN)
MOSAIC—"B"
DATE OF PHOTOGRAPHY 22 DECEMBER 1943
APPROXIMATE SCALE
1000' 0 1000' 2000'
OFFICE OF THE
ASST. C/AS, INTELLIGENCE

TOKO-BORYO DISTRICT

(Reconnaissance Photo Coverage: 7 November 1943)

The sparsely inhabited Toko-Boryo district has been reported to be an embarkation area, serving as an auxiliary to Takao as a convoy assembly zone. Earlier reports indicated that fuel stores (fed by a pipeline from Takao) and other ship facilities had been developed at Toko, but available reconnaissance reveals no sizeable installations.

The only important objective in this district is the Toko Seaplane Base (Target 162), about 1 mile E of the town. This large base is equipped with all facilities, including a power station, personnel barracks, about 14 miscellaneous shop buildings, four hangars and two unusually large, saw-tooth roof "hangars" (each measuring 520 by 210 ft.). Several reports have referred to a "branch air depot" here (aircraft parts and/or assembly), but the lack of activity on available reconnaissance makes it impossible to check these reports. However, the presence of the two large "hangars" indicates the possibility that large flying boats may be overhauled and/or fitted out here.

Reconnaissance also reveals that the branch RR from Takao has been extended to Toko and Boryo. Military barracks are located near Toko and Kato; a munitions depot and several possible aircraft detector installations are located E of the seaplane base.

TARGET TABULATION

No.	Name	Approximate Coordinates	Description and Significance
162	Toko Seaplane Base	22° 27' N 120° 27' E	Branch air depot. See Airport Survey, Tab XV.

CONFIDENTIAL - (British Confidential)

CONFIDENTIAL - (British Confidential)

CONFIDENTIAL
(British Confidential)

KEISHU

N

RR STATION

BRIDGE 1200'

NA-PI RIVER

BARRACKS

RR BRIDGE 810'

BARRACKS

UNIDENTIFIED INSTALLATIONS

NA-PI

NA-PI RIVER

1370' BRIDGE

RR BRIDGE 1360'

RR STATION

3 A/A

MUNITIONS

BOILER HOUSE

SEAPLANE BASE

TOKO - 1 MILE

RADIO

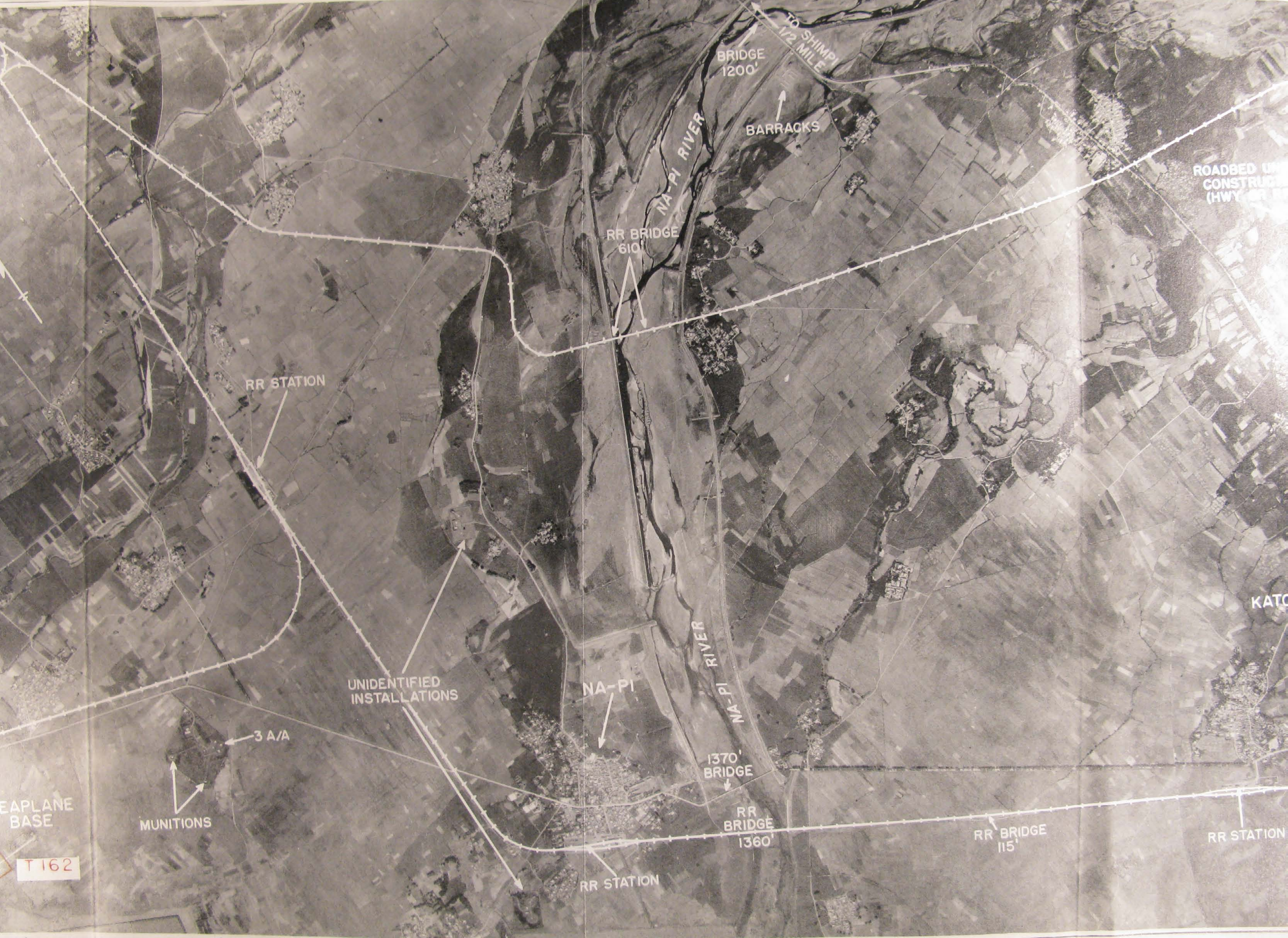
RAMP

SEAPLANE ANCHORAGE

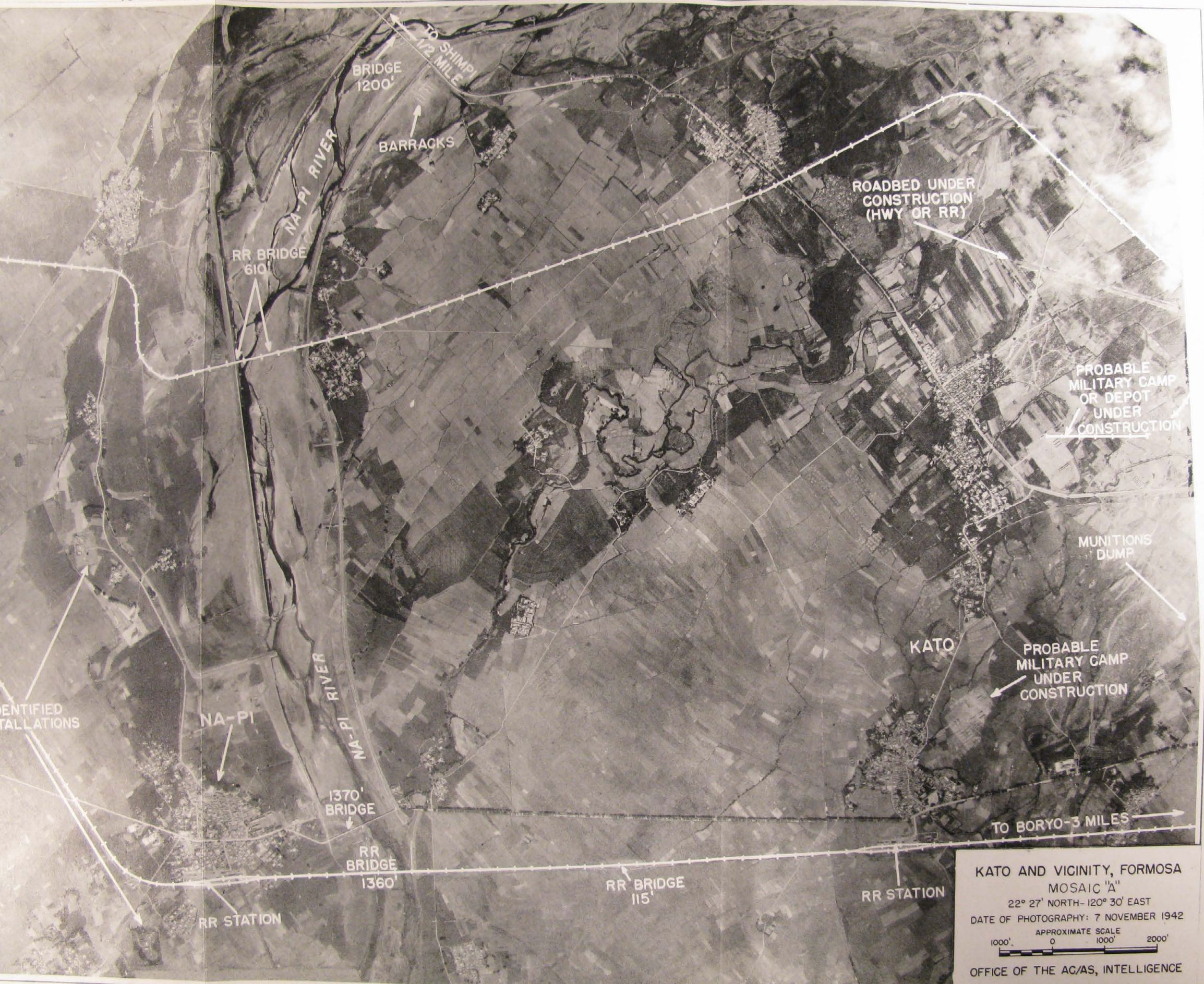
RAMPS

T 162

(British Commonwealth)



(British Confidential)



KATO AND VICINITY, FORMOSA

MOSAIC "A"

22° 27' NORTH - 120° 30' EAST

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1942

APPROXIMATE SCALE

1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

CONFIDENTIAL

GIRAN - SUO DISTRICT

(Reconnaissance photo coverage not available)

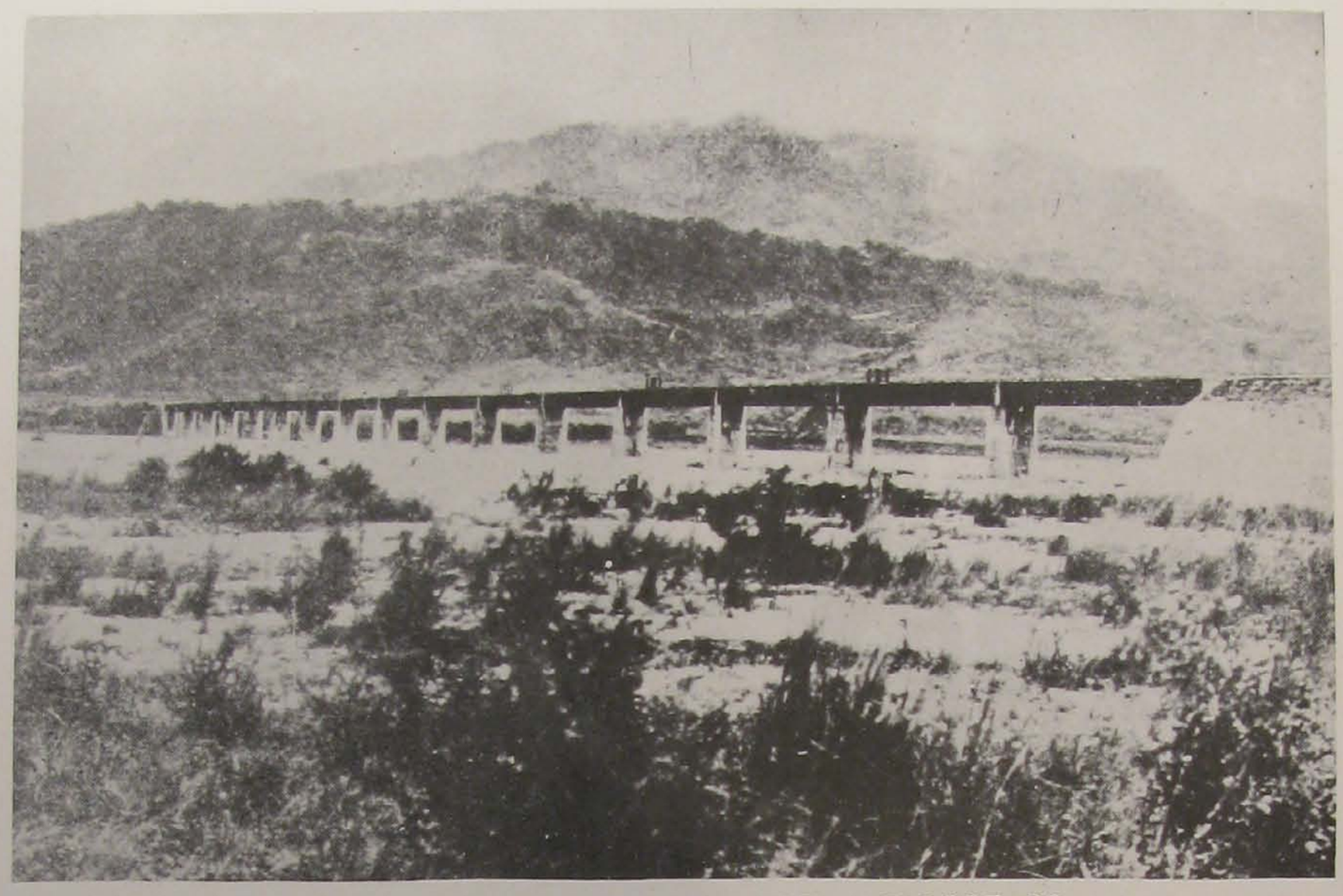
The Giran Plain, in NE Formosa, has little strategic significance. Principal economic activities are agriculture (rice), lumber (wood pulp) and fishing (centering at Suo). It is reported that a manganese deposit near Suo is being worked, part of the ore being processed in a small smelter near Rato, but most is shipped by rail to Keelung for processing. A light railway runs west from Rato, past the Maruyama Power Plant (Target 70) to the extensive Taiheizan forests in the mountain foothills.

Suo, the only port in this area, has a boat basin (Target 65) which is used by the fishing fleets operating off this coast. Reports that the bay was used as a submarine station could not be verified by reconnaissance of 8 November 1943. A cement mill is reported along the RR, near the town.

Tactical considerations may dictate the cutting of the Suo-Keelung RR line. This could most effectively be done at Hatto (near Keelung), but a bridge (Target 68) near Giran is also indicated as a possible objective.

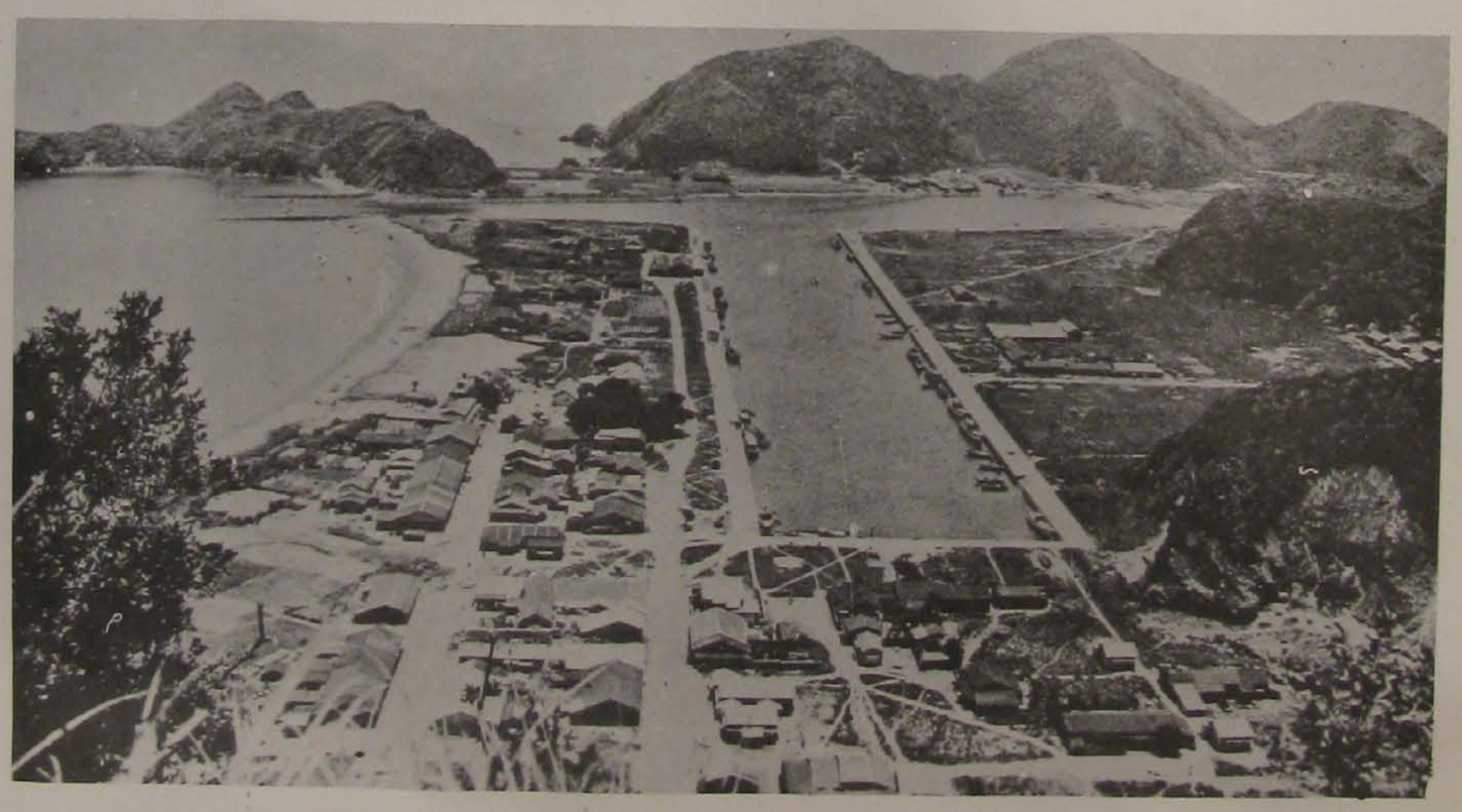
TARGET TABULATION

No.	Name	Approximate Coordinates	Description and Significance
65	Suo Basin	24° 35' N 121° 52' E	Basin for fishing boats, depths of 6-9 ft. Outer harbor affords good anchorage for large ships. Two small fuel tanks and two warehouses near mouth of basin. Fuel storage previously reported at tip of N bight of Suo Bay not verified by reconnaissance.
70	Maruyama Power Plant	24° 39' N 121° 40' E	18,000 KW hydro plant on Dakusui River. RR spur and power line lead to plant.
68	Dakusui River RR Bridge	24° 43' N 121° 46' E	Long, low bridge; steel on stone or concrete piers. About 3½ miles N of Rato.



DAKUSUI RIVER RR BRIDGE - TARGET 68

Bridge on Keelung - Suo spur line. View looks SW.



SUO BASIN - TARGET 65

Looking east over small boat basin at south side of Suo Bay. Oil tanks and warehouses are reported at right of basin. Bay affords good anchorage for large ships.

KARENKO

(No reconnaissance coverage available)

Aluminum, nickel and chemical works, and the only developed port on the east coast, give considerable importance to Karenko. The Japan Aluminum plant (Target 61) is reported to be an aluminum reduction works, alumina being imported from Japan Proper (source said to be Kurosaki, near Yawata). This would imply an inefficient utilization of shipping -- bauxite hauled to Japan, alumina to Karenko and aluminum back to Japan -- but available intelligence indicates this to be the pattern. Less is known of the nickel smelter (Target 62), which is credited with a capacity of about 10% of total Japanese requirements. Nickel ore is imported from the Celebes. Among the other plants reported to be located here are urea gypsum, phosphate, carbide works and artificial rock crystal. Available information is too inadequate to warrant the assignment of target numbers to any of these plants, but it is believed that they are significant only as suppliers of fertilizers to eastern Formosa. With the exception of one of the chemical plants (said to be located along the railroad in the city), the plants noted are all reported to be situated just west of Karenko Harbor.

Karenko's industries are reported to obtain their electric power from a series of hydro-electric plants located along the Mokka River, about 10 miles SW of the city. Spot locations for these plants are not available and they are not listed as targets.

The port of Karenko is a small artificial harbor, large enough to accommodate about 10-12 vessels (3-6,000 tons) at one time. Because of rough seas which prevail off this coast, ships must anchor within the very limited area enclosed by the breakwaters. The harbor could be blocked for a considerable time if several ships were sunk alongside wharves or near the narrow entrance channel.

TARGET TABULATION

No.	Name	Approximate Coordinates	Description and Significance
61	Japan Aluminum Co. (Nippon Aruminiumu K.K.)	24° 00' N 121° 37' E	Reported located just W of port; no details available. Capacity estimated at 5.7% of total Jap aluminum production. (About 6,000 tons per year).
62	Nickel Smelter (Toyo Kinzoku Seiren)	24° 00' N 121° 37' E	Reported located just W of port; no details available. Said to refine nickel (about 10% of Jap capacity) and also some cobalt.
64	Karenko Wharves	24° 00' N 121° 38' E	Best developed port on E coast; equipped with about 10 warehouses, cranes, and RR siding.
66	Karenko RR Station & Yards	23° 59' N 121° 36' E	Northern terminal of E coast RR. Small RR shops and several storehouses.

EXPERIMENTAL RELIEF MODEL OF KARENKO

CONFIDENTIAL

NW PART OF KARENKO CITY

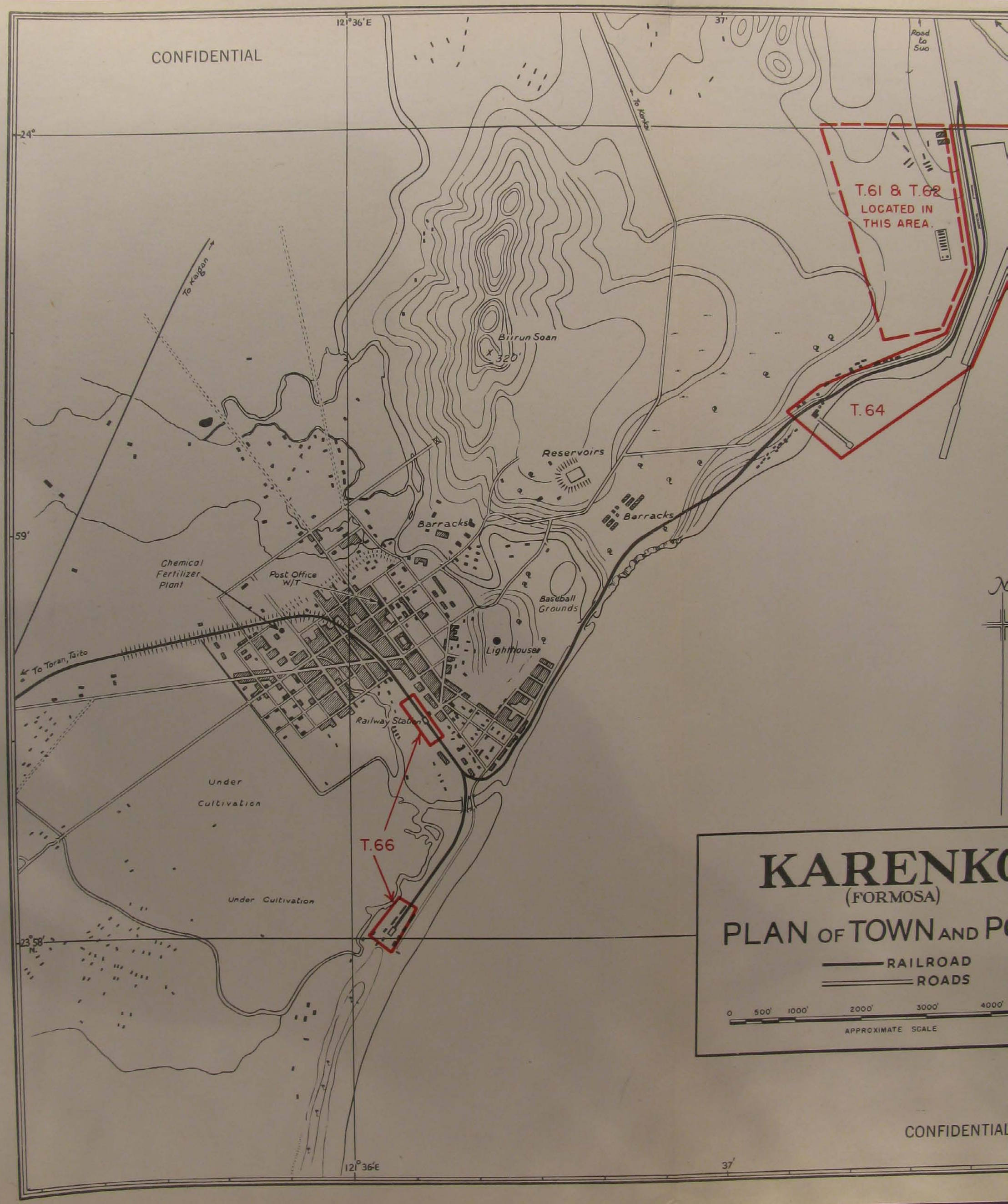
Old view of Karenko, looking NW. Part of the railroad station (Target 66) is visible at the left and a chemical fertilizer plant shows in the upper left corner.

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL



CONFIDENTIAL

PESCADORES ISLANDS

(Reconnaissance Photo Coverage: 7 November 1943)

Mako Island, the largest and most extensively developed of the Pescadores Islands, contains an important concentration of military installations, including fuel and munitions stores, ship repair facilities, at least one operating airfield and numerous gun positions. Bako Bay (also known as Mako Bay), one of the largest deep-water anchorages in the Taiwan Strait, is used intermittently for convoy fueling and assembly, and the Ansan Naval Base serves as a station for naval escort vessels. The development of new Japanese bases at Hong Kong, Hainan and Takao, and the relative nearness of China-based United States aircraft have reduced the usefulness of this naval base. Its primary functions are now: (1) convoy control, (2) aircraft detection and defense and (3) defense outpost for Formosa and the Strait area against seaborne attack.

The whole of Bako Island is strongly fortified with A/A and C/D guns. Incomplete reconnaissance coverage indicates that many of the small islands which surround Bako are fortified (both A/A and C/D guns), but they have few other installations.

TARGET TABULATION

No.	Name	Approximate Coordinates	Description and Significance
	ANSAN NAVAL BASE	23° 33' N 119° 34' E	Located on small island, connected to Bako only by a causeway, base occupies area of about 2200 by 2200 ft. Facilities include administrative and barracks bldgs, 400 ft. graving dock & repair shops, small power plant, two small oil tanks & a large coaling wharf. Naval escort vessels dock in central anchorage.
145---	Drydock		
146---	Wharves		
152---	Stores		
	ANSAN FUEL AND MUNITIONS STORAGE	23° 33' N 119° 34' E	Rectangular area 3100 ft. NE/SW by 1000 ft. NW/SE. Three large earth-covered fuel tanks near bunkering pier at SW end of area & 3 very large (240 ft. diameter) buried fuel tanks at NE end. Revetted munitions stores (torpedo & mine depot) along S side.
150---	Oil Stores		
151---	Torpedo & Mine Depot		
165---	Underground Oil Tanks		
147	Bako Harbor	23° 34' N 119° 33' E	Three piers & large concrete basin, several storehouses along basin. Used by ships supplying Bako Island.
156	Bako Power Plant	23° 34' N 119° 34' E	Principal power source for island; Ansan Naval Base has own plant.
153	North Fort Magazine	23° 34' N 119° 35' E	Revetted concrete magazines; munitions for coast batteries, etc.

MAKO ISLAND, PESCADORES
23° 31' N - 119° 35' E
Date 7 Nov 1943

APPROXIMATE SCALE
0 1/4 1/2 3/4 1 2
STATUTE MILES

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

DEFENSIVE BARRIER

TAMPI BAY

POSSIBLE RADAR

FIRING RANGE

4 A/A

BURIED STORAGE

TANG-UI

MUNITION STORAGE

PERSONNEL BL
& BARRACKS

A/A & C/D GUNS

MUNITION STORAGE

T153

BARRACKS AREA

BLDGS. IN DUGO

WATER TANK

PROB. BARRACKS

WAREHOUSE AREA

POWER PLANT

T.156

A/A POSITIONS

MAKO

PROB. WATERWORKS

T 147

C/D GUNS

PIPEL

BARRACKS AREA

RADIO
(3 TO

STORAGE BUILDINGS

"OLD" AIR

GRAVING DOCK
80' x 400'

MILITARY BARRACKS

2 FUEL TANKS

BARRACKS

FORMER HANGAR

T.165

CONVOY ASSEMBLY

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

TAMPI BAY

DEFENSIVE BARRIER

POSSIBLE RADAR

FIRING RANGE

4 A/A

BURIED STORAGE

TANG-UI

MUNITION STORAGE

PERSONNEL BL & BARRACKS

A/A & C/D GUNS

MUNITION STORAGE

T153

BARRACKS AREA

BLDGS. IN DUGO

WATER TANK

PROB. BARRACKS

WAREHOUSE AREA

POWER PLANT

T.156

A/A POSITIONS

MAKO

PROB. WATERWORKS

T 147

C/D GUNS

PIPEL

BARRACKS AREA

STORAGE BUILDINGS

"OLD" AIR

RADIO (3 TO

MILITARY BARRACKS

GRAVING DOCK 80' x 400'

2 FUEL TANKS

BARRACKS

FORMER HANGAR

T.165

CONVOY ASSEMBLY

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

TAMPI BAY

BURIED STORAGE

KOTEI

N

TANG-UI

PERSONNEL BLDGS. & BARRACKS

STORAGE

BLDGS. IN DUGOUTS

MUNITION STORAGE

T153

WATER TANK

POWER PLANT

T.156

T 147

PROB. BARRACKS

PROB. WATERWORKS

PUMPING STATION

PIPELINE

TO OKAM

RADIO STATION (3 TOWERS)

STORAGE BUILDINGS

GRAVING DOCK 80' x 400'

2 FUEL TANKS-

BARRACKS AREA

FORMER HANGAR

T.165

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

MAKO (BOKO) ISLAND
(THE PESCADORES)
23° 33' N - 119° 34' E

MOSAIC "A"

DATE OF PHOTOGRAPHY: 7 NOVEMBER 1943
APPROXIMATE SCALE
1000' 0 1000' 2000'

OFFICE OF THE AC/AS, INTELLIGENCE

U. S. CONFIDENTIAL
BRITISH CONFIDENTIAL

United States SECRET
Equals British MOST SECRET and SECRET

AIRPORT SURVEY OF FORMOSA

NAME	LOCATION*	FACILITIES
1. Chosu Airport (Kagi)**	23° 30' N 120° 31' E	Reported bomber base, auxiliary to Kagi. (NOTE: This is probably incorrect; field may be same as Keishu, #9).
2. Einansho Airport (Tainan)	22° 57' N 120° 12' E	Large airport, with 5 hangars plus 2 under construction; extensive storage & personnel facilities but limited repair & maintenance. Most buildings on E side of field; numerous wall-type revetments, at NE & SW ends of field. (Reconnaissance photo: 7 Nov. 1943)
3. Garambi Airport (Garambi)	21° 55' N 120° 51' E	Reported naval emergency field, and adjoining seaplane anchorage
4. Giran Airport (Giran)	24° 45' N 121° 45' E	Reported small field, "T"-shaped runways. Limited facilities
5. Heito Airport (Heito)	22° 40' N 120° 27' E	Large airport with one paved runway (3860 ft.), 11 hangars, 2 large and several small "depot" buildings, and shops, barracks and stores -- all at NE end of field. Another barracks' area just SE of field. Dispersal revetments along N and S sides. Target 57. (Reconnaissance photo: 22 December 1943).
6. Itahashi Airport (Itahashi)	25° 01' N 121° 27' E	Reported small landing field
7. Kagi Airport (Kagi)	23° 27' N 120° 23' E	Reported one of 3 principal air bases in Taiwan. Equipped with hangars & numerous bldgs at NE end of field. Underground fuel storage. Complete maintenance facilities.
8. Karenko Airport (Karenko)	24° 02' N 121° 37' E	Reported naval air base & seaplane station, hangars & barracks on E side. Recently equipped with major maintenance facilities. An "aircraft factory" is also reported here.
9. Keishu Airport (Keishu) (also known as Choshu)	22° 30' N 120° 31' E	Reported bomber base
10. Koko Airport (Koko)	24° 52' N 121° 03' E	Reported paratroop training base & bombing practice station
11. Koshun Airport (Koshun)	22° 02' N 120° 43' E	Small field, two "L"-shaped runways, limited facilities; several revetments along western side. (Reconnaissance photo: 7 Nov. 1943).
12. Kotosho Airport (Kotosho Is.)	22° 03' N 121° 32' E	Landing field reported

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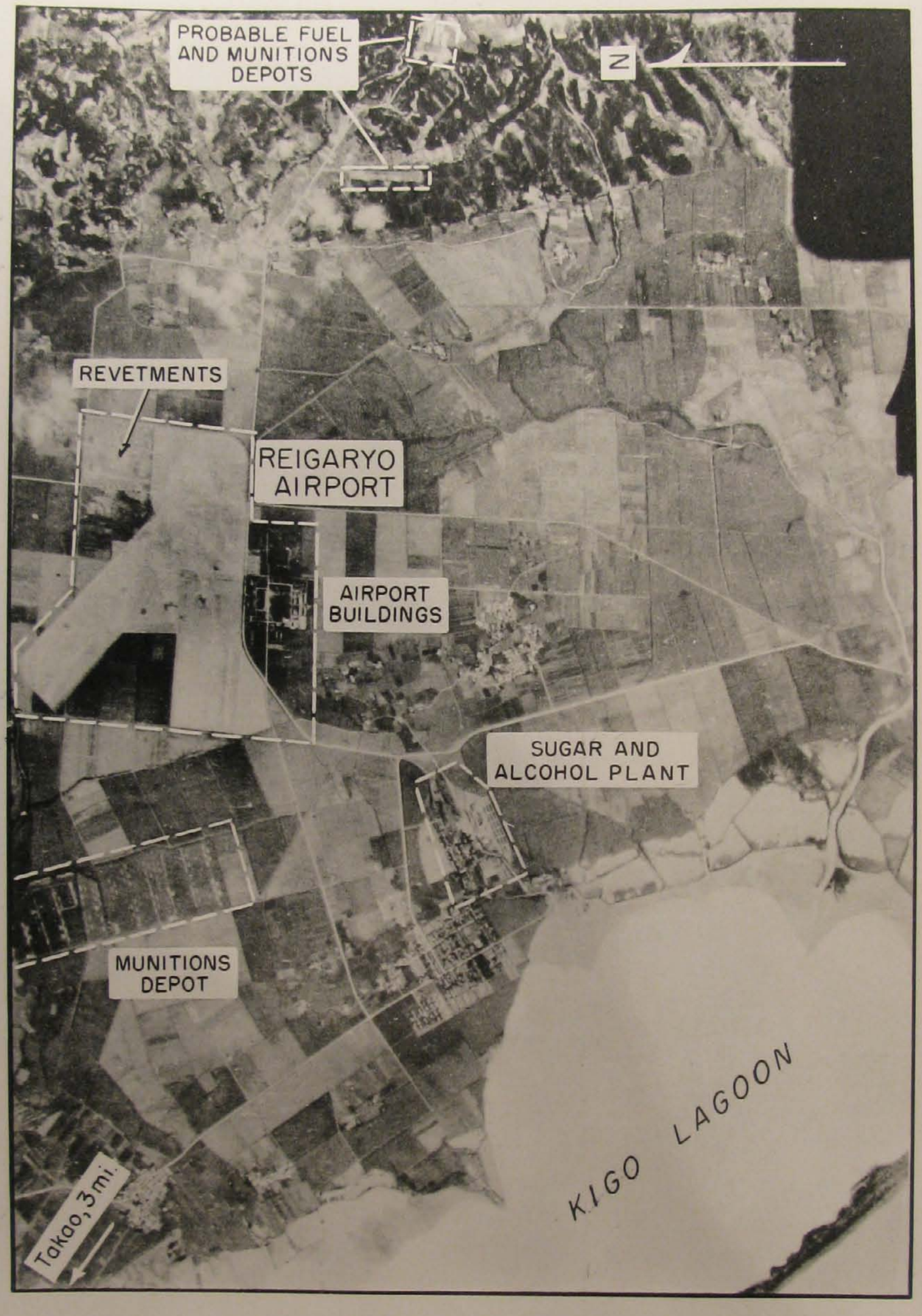
* Approximate coordinates only
** Name in parentheses indicates nearest important town.

United States SECRET
Equals British MOST SECRET and SECRET

NAME	LOCATION	FACILITIES
13. Matsuyama Airport (Taihoku)	25° 04' N 121° 33' E	Reported major military air base with all facilities. Hangars & barracks in SW corner of field. Major maintenance & repair facilities; aircraft assembly reported. Target 52.
14. Midako Seaplane Anchorage & Landing Field (Midako)	22° 46' N 120° 12' E	Reported small landing field & seaplane anchorage
15. Okayama Airport (Okayama)	22° 48' N 120° 16' E	Major air base with complete facilities. Four paved runways (longest: 3700 ft); 6 hangars; extensive shops & storage bldgs at SW end; possible aircraft assembly and/or parts plant, large; numerous revetments on all sides. (Reconnaissance photo: 7 Nov. 1943).
16. Reigaryo Airport (Takao)	22° 36' N 120° 18' E	Large field, no runways. Bomber training base. Limited facilities. Few small bldgs & revetments. (Reconnaissance photo: 7 Nov. 1943).
17. Reigaryo Seaplane Base (Takao)	22° 35' N 120° 18' E	Two ramps, one hangar & 4 miscellaneous bldgs. Limited facilities. (Reconnaissance photo: 7 Nov. 1943).
18. Riko Airport (Riko)	22° 46' N 120° 28' E	Reported airport of moderate size.
19. Rokko Airport (Rokko)	24° 03' N 120° 26' E	Reported airfield & parachute training school.
20. Shajo Airport (Shajo)	22° 05' N 120° 42' E	Emergency landing field reported.
21. Shinchiku Airport (Shinchiku)	24° 50' N 120° 58' E	Large bomber base & bomber training school. All facilities. 4 concrete runways; large hangars, many barracks, other bldgs on E side. Has been attacked. (Reconnaissance photo: 1 April 1943).
22. Shinko Airport (Shinko)	23° 35' N 120° 09' E	Secondary military airfield reported
23. Suiteiryo Airport (Boryo)	22° 23' N 120° 35' E	Reported military airport with hangars & underground fuel storage. Base for naval air unit.
24. Taichu Airport (Taichu)	24° 09' N 120° 39' E	Small field, limited facilities. About 5 hangars, several shops & barracks. Few revetments, no runways. Located about 2 mi. NW of town of Taichu. (Reconnaissance photo: 23 Nov. 1943).
25. Taito Airport (Pinan)	22° 47' N 121° 05' E	Reported military airport with limited facilities, improved recently.
26. Tamsui Seaplane Station (Tamsui)	25° 11' N 121° 25' E	Seaplane station with ramp. Oil tanks to N (Reconnaissance photo: 1 April 1943).

NAME	LOCATION	FACILITIES
27. Toko Seaplane Base (Toko) (also known as Kato Seaplane Base)	22° 27' N 120° 27' E	Major seaplane station, with 6 large hangars, several shops & storage bldgs; small power plant. Target 162. (Reconnaissance photo: 7 Nov. 1943).
28. Toseki Airport (Toseki)	23° 29' N 120° 09' E	Reported landing field, auxiliary to Kagi.
29. Toyohara Airport (Toyohara)	24° 13' N 120° 38' E	Moderately large field, being enlarged. No runways, many dispersed revetments on all sides. Appears to be primarily a fighter base. 3 hangars & numerous barracks, shops, etc. Located about 5 mi W of Toyohara. (Reconnaissance photo: 23 Nov. 1943).
PESCADORES		
30. Keimo-U Airport	23° 34' N 119° 34' E	Small landing field, no facilities. Appears to be abandoned. (Reconnaissance photo: 7 Nov. 1943).
31. Sekisan Airport (Chiyobusui)	23° 31' N 119° 35' E	1500 by 3600 ft. landing area, no runways. Two hangars, several barracks bldgs. Eight revetments. (Reconnaissance photo: 7 Nov. 1943).

CONFIDENTIAL
(British Confidential)



REIGARYO AIRPORT
FORMOSA
22° 36' N - 120° 18' E
Date-Nov. 7, 1943

APPROX. SCALE
0 1 2
STATUTE MILES

AC/AS — INTELLIGENCE
CONFIDENTIAL
(British Confidential)

KOSHUN AIRPORT — FORMOSA

22° 01' 30" N 120° 43' 30" E

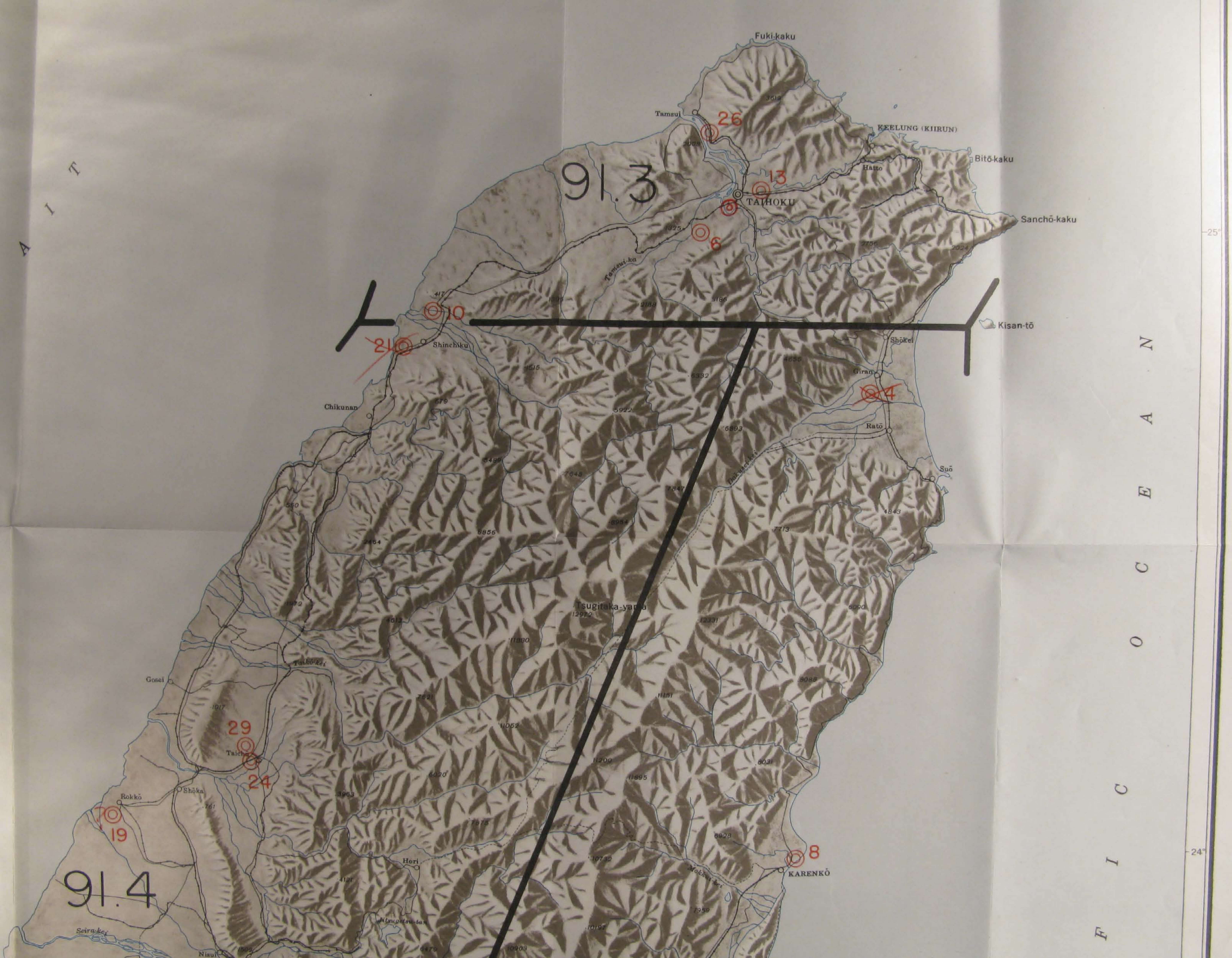
DATE OF PHOTOGRAPHY 7 NOVEMBER 1943

APPROXIMATE SCALE

1000' 0' 1000' 2000' 3000'

OFFICE OF THE AC/AS, INTELLIGENCE

F O R M O S A S T R A I T
Tamsui
26
91.3
13
TAIHOKU
6
10
21
Shinchiku
Chikunan
Tsugitaka-yama
Taikō-kei
Gosei
29
Taichū
24
Shōka
Rokkō
19
Hori
8
KARENKŌ
91.4
Seira-kei
Nisui



Fuki-kaku
Tamsui
26
KEELUNG (KIIRUN)
Bitō-kaku
91.3
13
TAIHOKU
Sanchō-kaku
6
25°
10
Kisan-tō
21
Shinchiku
Shōkei
Giran
4
Chikunan
Ratō
Suō
Tsugitaka-yama
Gosei
29
24
Shōka
Rokkō
19
Hori
8
KARENKŌ
24°
91.4
Seira-kei
Nisui
P A C I F I C   O C E A N

AIRPORT SURVEY

FORMOSA

(TAIWAN)

Mercator Projection

Scale 1:500,000 at Latitude 35°

10 5 0 10 Miles 20 30 40

Lat. 25° 25° Lat.

Lat. 22° 22° Lat.

Elevations in feet

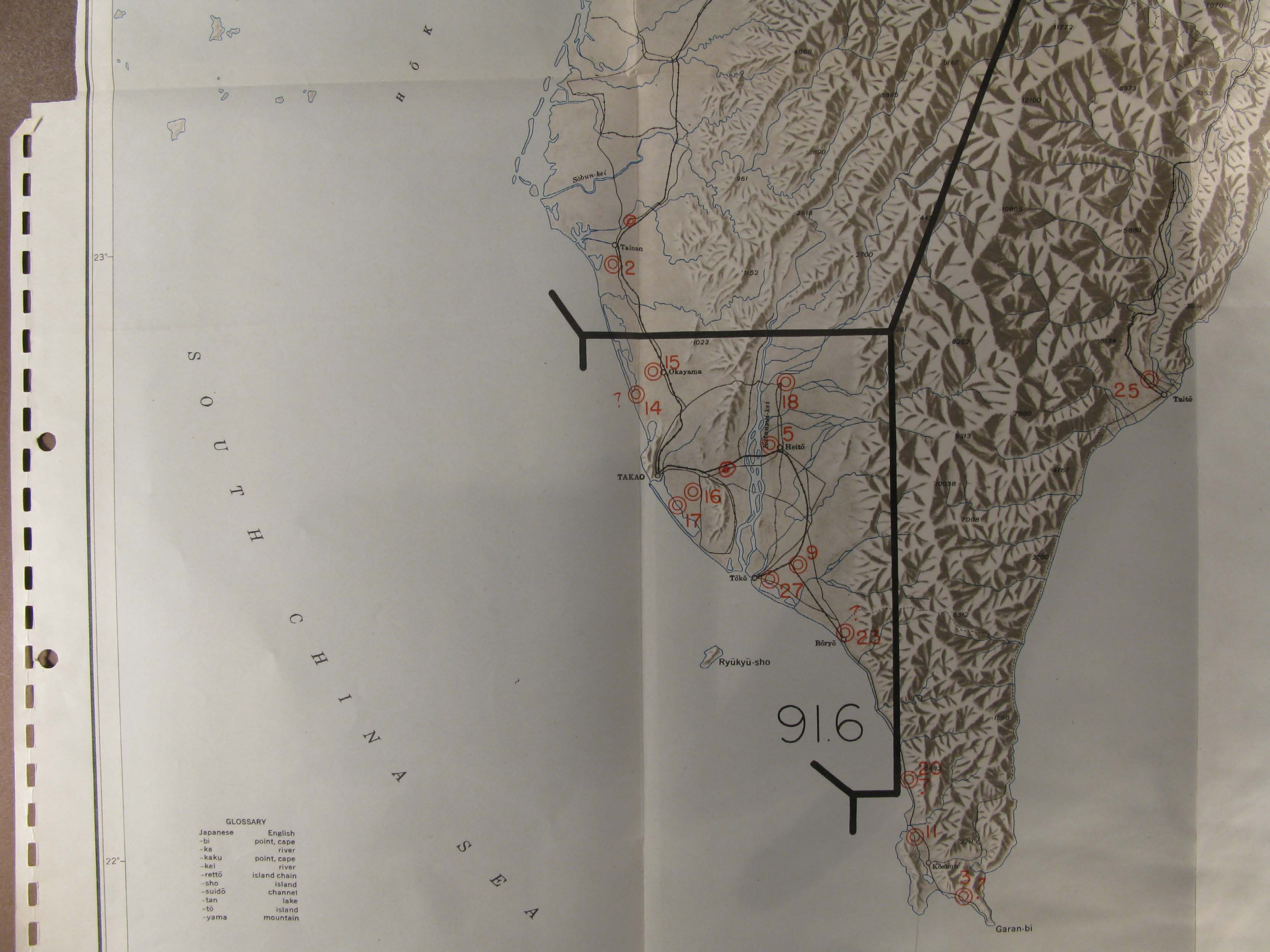
PREPARED AND REPRODUCED IN THE
UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY
FOR THE WAR DEPARTMENT
OFFICE OF THE ASSISTANT CHIEF OF AIR STAFF, INTELLIGENCE

FEBRUARY 1944

NORTH PACIFIC OCEAN

Tainan
Okayama
Heitō
TAKAO
Tōkō
Bōryō
Kōshun
Taitō
Kashō-tō
Kōtō-sho
Ryūkyū-sho
Garan-bi
Sōbun-kei
Kōtōsui-kei

91.6



GLOSSARY

Japanese	English
-bi	point, cape
-ka	river
-kaku	point, cape
-kei	river
-rettō	island chain
-sho	island
-suidō	channel
-tan	lake
-tō	island
-yama	mountain

Hōko-tō

31

RES ISLANDS

O RETTŌ)

HŌKO-SUIDŌ

22

7

28

7

Kagi

1

Sōbun-kei

Tainan

2

15

Okayama

?

14

18

5

Heitō

Kōmasaki-kei

TAKAO

16

17

9

27

Tōkō

23

Bōryō

Ryūkyū-sho

25

Taitō

Kashō-tō

Niitaka-yama

13075

AIRPORT

FORM

(TAIW

Mercator

Scale 1:500,000

10 5 0 10 Mi

Lat. 25°

Lat. 22°

916

CHINA SEA

30
Hōko-tō
31
PESCADORES ISLANDS
(HŌKO RETTŌ)
HŌKO-SUIDO
SOUTH CHINA
23°
22
7
1
Kagi
28
Niitaka-yama
13075
Sōbun-kei
Tainan
2
15
Okayama
14
18
5
Heitō
TAKAO
16
17
9
Tōkō
27
25
Taitō
28
Bōryō
Ryūkyū-sho
91.6

GEOGRAPHY

Roughly oval in shape, Formosa measures 250 miles N/S by 93 miles E/W. A N/S mountain barrier divides the island into two distinct regions -- a low plain to the west and a mountain mass interspersed with small valleys to the east. The central mountain range averages about 10,000 ft., with the highest peak (Mt. Niitaka) rising to over 13,000 feet.

A narrow valley, lying parallel to the sea, separates the central range from a lesser range along the east coast. Rising abruptly from the sea, this range is marked by sheer cliffs and rocky promontories. Small sloping plains, formed by the estuaries of streams draining the central and lesser ranges, are located at each end of the eastern range. These valleys (at Karenko and Taito) together with a larger one at Giran to the north, contain the only centers of population and cultivated land along the east coast. The only natural harbor is at Suo, but an artificial port has been developed at Karenko, and vessels lighter off the Taito roadstead in calm weather.

The Tamsui and Keelung river valleys divide the northern part of the island into two mountain masses. Peaks rise to over 3000 ft. on either side of the 10 mile wide Taihoku plain. The northern port of Keelung lies in a restricted pocket at the foot of the central mountain range, approachable only through a narrow beach shelf from the sea or through a steep valley south by west of the city.

SW of Taihoku, and separated from it by a low spur of foothills, is the rolling Shinchiku plain, much of it consisting of rice paddy fields. This plain in turn is cut off from the principal coastal plain to the south by irregular foothills which extend northwestward from the central range to the sea.

This west coast plain, about 100 miles N/S by 20 miles E/W, is the principal agricultural region of Formosa, devoted to sugar cane, rice, sweet potatoes and tropical fruits. Sandy beaches, 50 to 100 yards at low water, extend along much of this coast. The coastal waters are very shallow, and at low tide extensive mud flats are exposed -- especially off Tainan.

The southern part of the island consists of a hilly plain along the east side of the multi-channeled Shimo-Tamsui River with a low spur of hills to the west and the lower part of the central range to the east. This valley is largely devoted to sugar cane and pineapple. Takao is the only developed harbor, but the roadsteads off Boryo and Toko are used for lightering.

The rivers of Formosa are short and swift, especially along the east coast. Mere creeks during the dryer season, these streams are susceptible to severe flash floods during the wet season (July and August). The lower reaches of most of these rivers are multi-channeled and gravelly, often filled with large boulders.

There is only one sizeable lake, Jitsugetsutan Lake (elevation 2400 feet) near the island's center. There are hundreds of small ponds, especially around Shinchiku.

The foothills and lower mountain slopes are covered with thick tropical forests. Large camphor trees grow in the upper slopes, while spruce, hemlock and pine cover the slopes from 5000 up to 12,000 feet. Bamboo and mangrove dot the lowlands.

OFF-SHORE ISLANDS

About 14 small islands and many islets lie close to Formosa, but few of them are inhabited. The Pescadores (Hoko Retto) lie about 26.5 miles from Formosa's west coast. In addition to the principal island of Mako (Bokoto), there are 7 minor islands and many tiny islets. All are extremely irregular, low-lying (maximum elevation being 300 ft.) and barren.

Several islets lie on the southwestern approach to Keelung Harbor; Keelung To being the most conspicuous by virtue of its sharp cone, 600 feet high.

Two small islands, Kashoto and Kotosho, lie about 20 and 34 miles respectively off the SE coast. These are inhabited by aboriginal tribes.

The Batan (Baski) islands lie across a narrow channel from the southernmost tip of Formosa, forming part of a chain which extends toward Luzon in the Philippines.

KEELUNG RIVER

View along Keelung River, just SW of Keelung, showing cableway leading from one of many small coal mines in area. This may be one of the cableways that leads directly to the coaling wharf in the port of Keelung.

UPPER DAKUSUI RIVER

View along upper Dakusui River in central Formosa, showing typical aboriginal village and mountain trail. Buildings on upper terrace at right are native school and local police station. Note telegraph line leading from upper right corner of village.

HORI PLATEAU AND LAKE JITSUGETSUTAN

Looking NE across the Hori plateau, elevation about 2400 ft., showing Lake Jitsugetsutan in left center.

GARAMBI LIGHTHOUSE

Looking SW along southern tip of Formosa

GENERAL VIEWS OF EASTERN FORMOSA

KARENKO, FORMOSA

Looking SW toward mountain range in background.

TAITO, FORMOSA

Looking east over agricultural town of Taito. View indicates anchorage (at upper left) where ships lighter cargo.

CLIFF ROAD

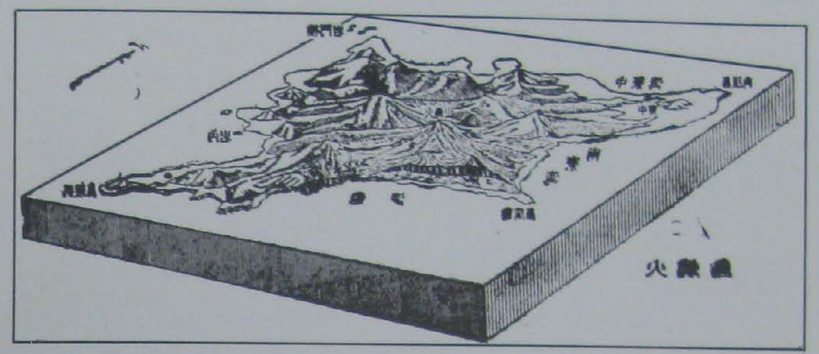
Suo - Karenko cliff road.

CLIFF ROAD NEAR SUO

View of east coast cliff road descending toward Suo at upper right.

KOTOSHO ISLAND

Located about 40 miles east of the southern tip of Formosa, Kotosho is a mountainous island with a small aboriginal population. The island has two deep-water anchorages and a possible airfield.



KASHOTO ISLAND

Kashoto is located about 20 miles E by S of Taito. Sketch looks northwest. Note cliffs along coast in foreground.

EASTERN SHORE OF KOTOSHO ISLAND

Looking north along the east coast anchorage. The small village of Iwarinu is visible in right foreground. A second deep-water anchorage is located on the SW coast.

Figure No. 7
Survey of Formosa

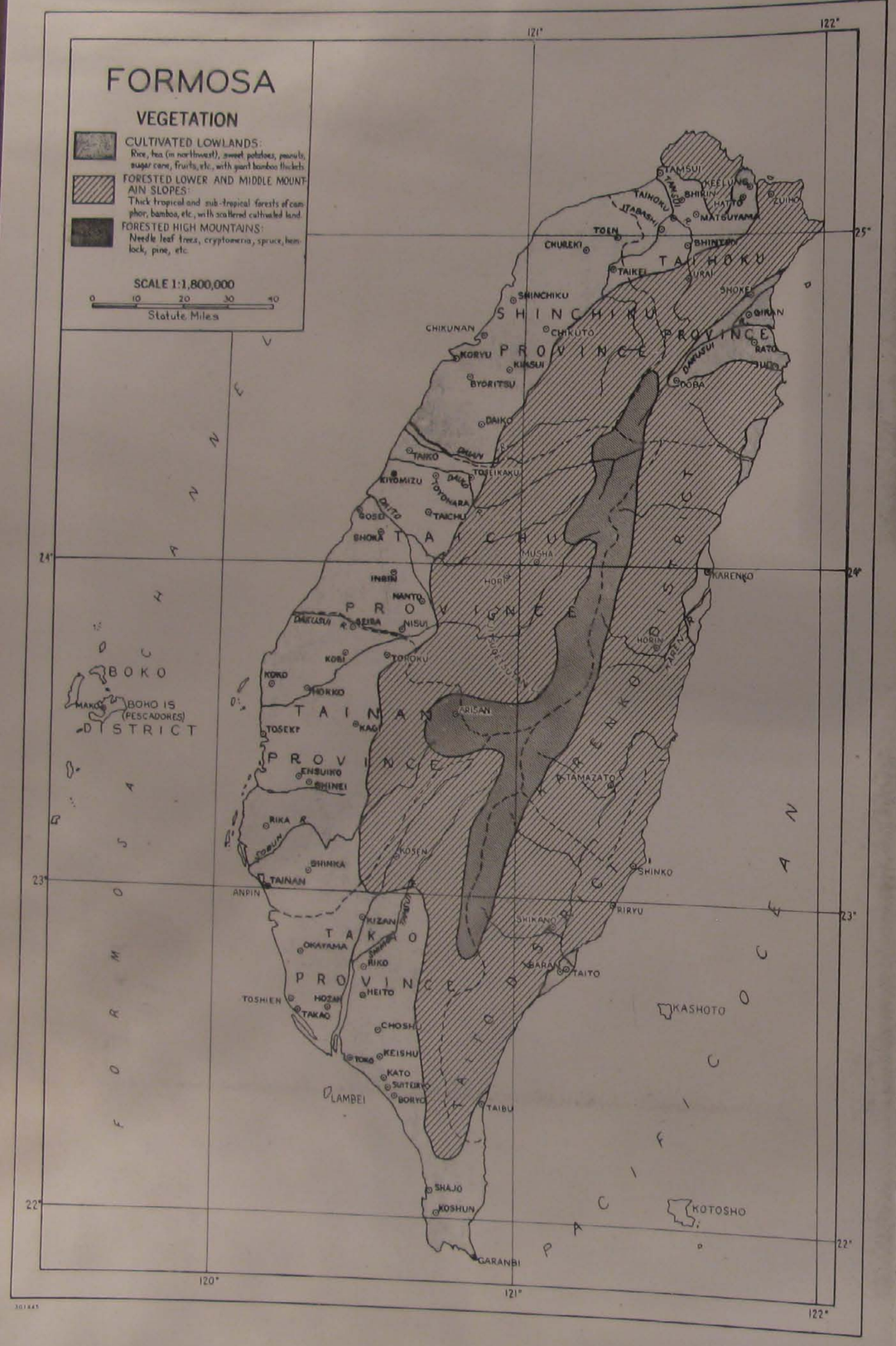
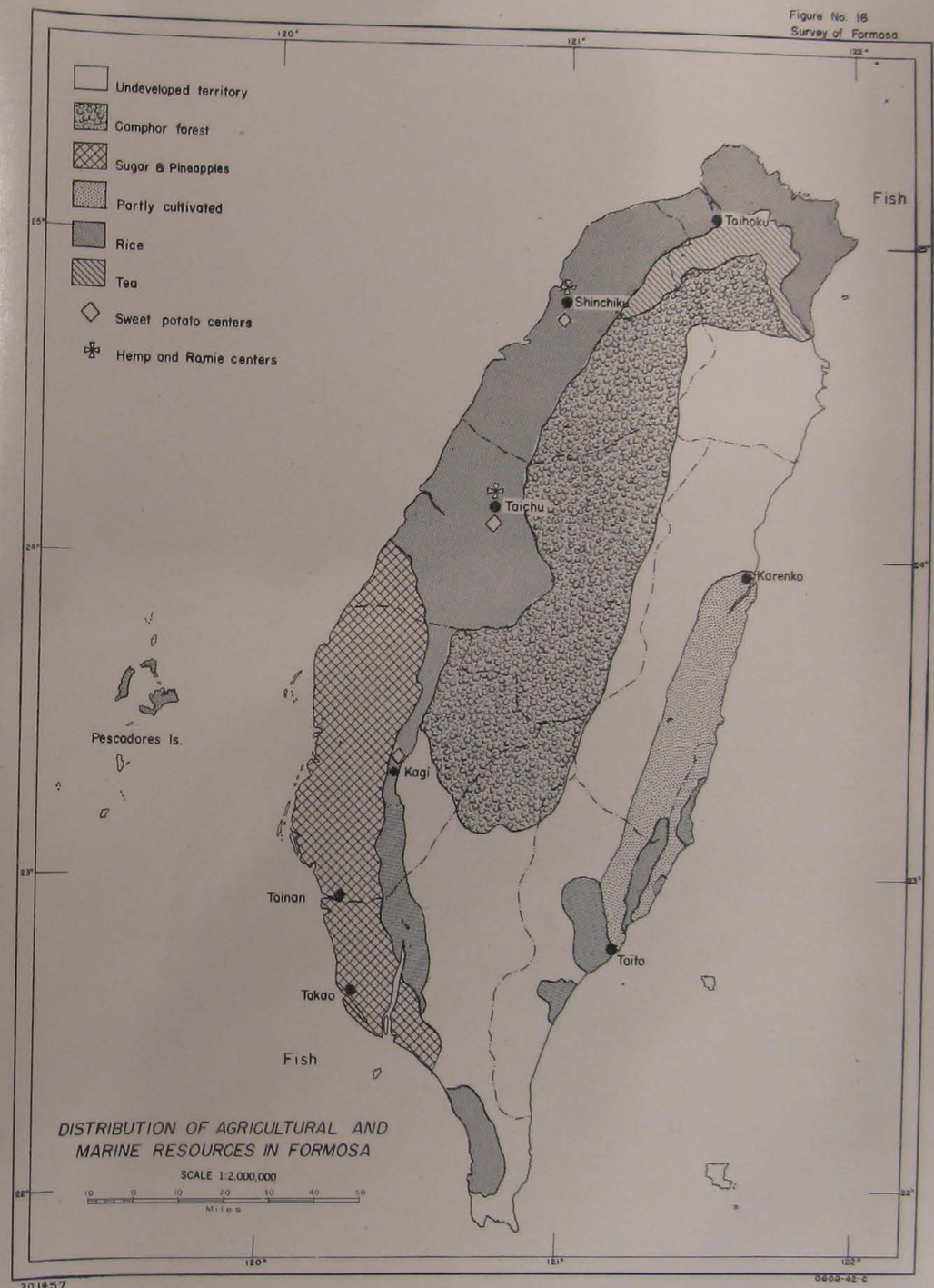


Figure No. 16
Survey of Formosa



DISTRIBUTION OF AGRICULTURAL AND MARINE RESOURCES IN FORMOSA

SCALE 1:2,000,000

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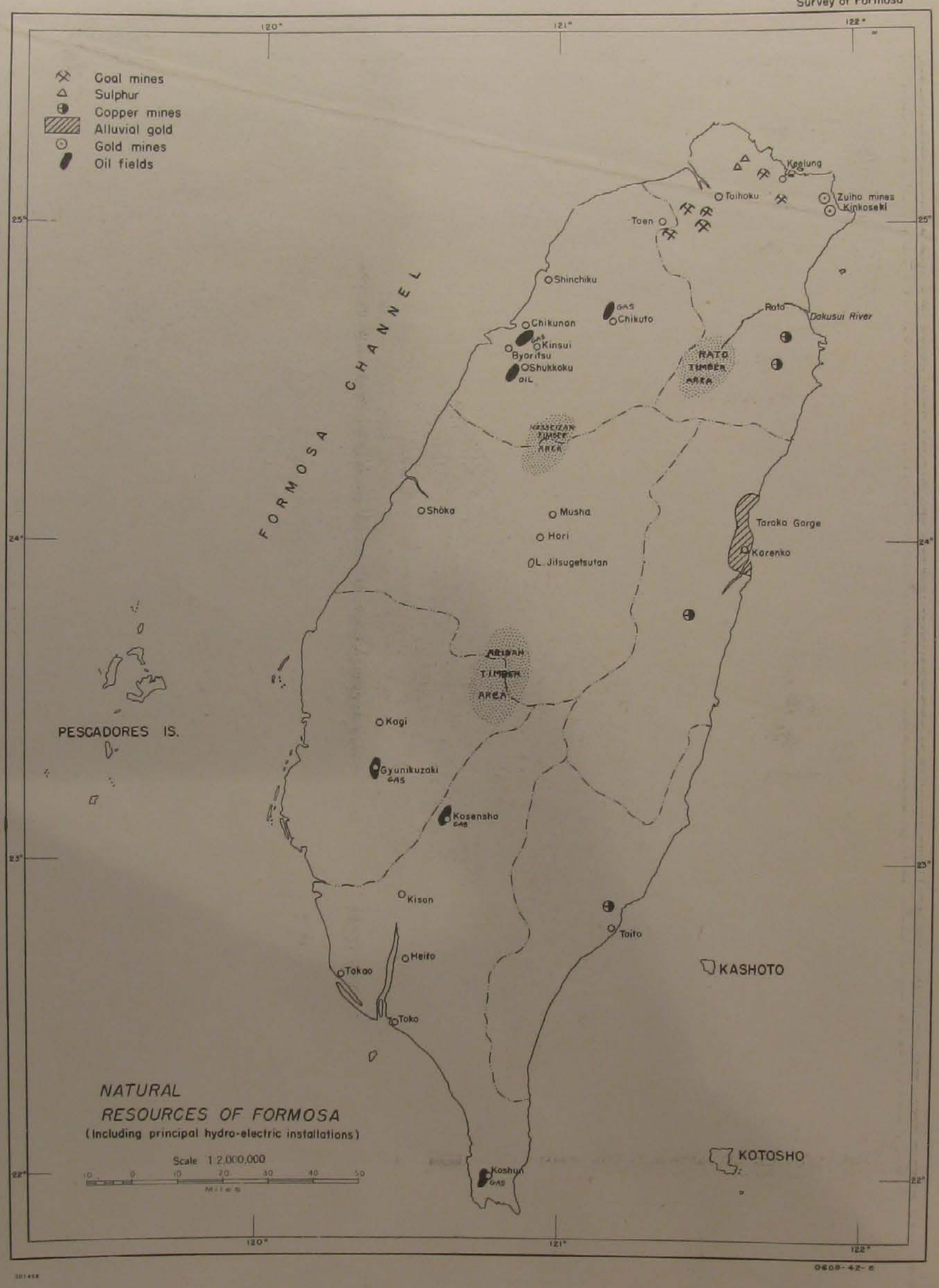
Miles

301457

8803-42-c

Figure No 17
Survey of Formosa



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S T R A I T

P A C I F I C O C E A N

Fuki-kaku

Tamsui

KEELUNG (KIIRUN)

Bitō-kaku

Hatto

TAIHOKU

Sanchō-kaku

Kisan-tō

Shinchiku

Chikunan

Shōkei

Giran

Ratō

Suō

Tsugitaka-yama

Taikō-kei

Gosei

Taichū

Shōka

Rokkō

Hori

KARENKÔ

Seira-kei

F O
24°
23°
Gosei
Taichū
Shōka
Rokkō
Seira-kei
Nisui
Hori
Dakusui-kei
Kagi
Niitaka-yama
13075
Sōbun-kei
Tainan
Hōko-tō
PESCADORES ISLANDS
(HŌKO RETTŌ)
H Ō K O - S U I D Ō

T H E P A C I F I C O C E A N

24°

KARENKŌ

Tsugitaka-yama

Hori

Nitaka-yama

Taichū

Shōka

Gosei

Rokkō

Nanri

Seiro-kei

Kauri

Shun-kei

O R M

Hōko-tō

PESCADORES ISLANDS

(HŌKO RETTŌ)

H Ō K O - S U I D Ō

Gosei

Taichū

Shōka

Rokkō

Nisui

Kagi

Hori

Tsugitaka-yama

12972

Niitaka-yama

13075

KARENKŌ

Taikō-kei

Seira-kei

Sōbun-kei

Itsugetsu-tan

Takusei-kei

Hōko-tō

ADORES ISLANDS

(HŌKO RETTŌ)

HŌKO SUIDŌ

Kagi

Niitaka-yama

13075

Sōbun-kei

Tainan

Okayama

Katsuraki-kei

Heitō

TAKAO

Tōkō

Bōryō

Ryūkyū-sho

Taitō

Kashō-tō

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Merc

Scale 1:5

Lat. 25°

Lat. 22°

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Ele

PREPARED

UNITED STATES DEPARTMEN

T H C H I N A

CADORES ISLANDS
(HŌKO RETTŌ)

H Ō K O

T H E C H I N A S E A

Sōbun-kei

Tainan

Okayama

Kaohsiung-kei

Heitō

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PREPARE

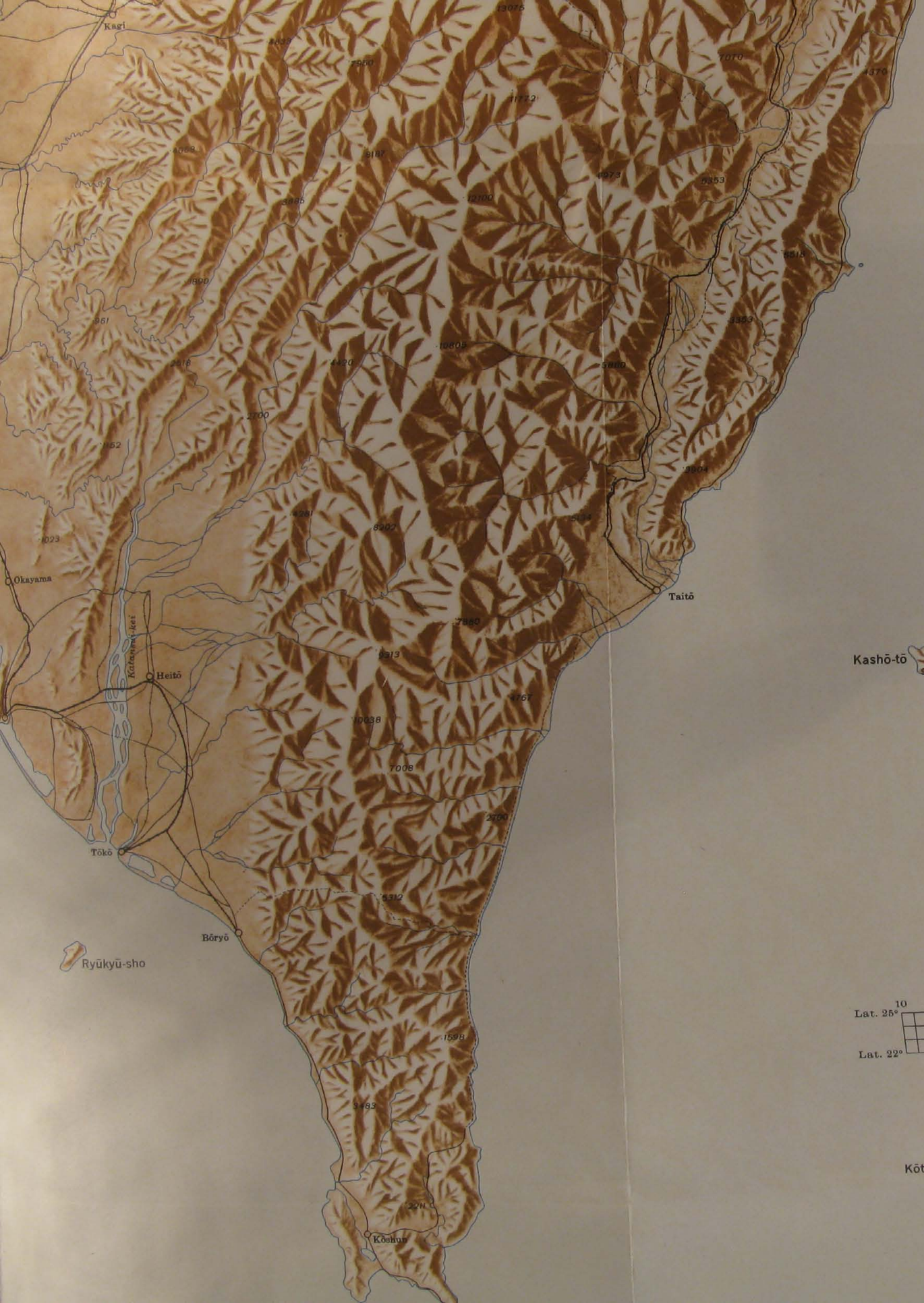
UNITED STATES DEPARTM

FOR

OFFICE OF THE ASSIS

GLOSSARY

anese	English
	point, cape
	river
ku	point, cape
	river
tō	island chain
o	island
idō	channel
n	lake
	island
ama	mountain



FORMOSA
(TAIWAN)

Mercator Projection

Scale 1:500.000 at Latitude 35°

10 5 0 10 Miles 20 30 40

Lat. 25° — 25° Lat.

Lat. 22° — 22° Lat.

Elevations in feet

PREPARED AND REPRODUCED IN THE
UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY
FOR THE WAR DEPARTMENT
OFFICE OF THE ASSISTANT CHIEF OF AIR STAFF, INTELLIGENCE

FEBRUARY 1944

THE WEATHER AND CLIMATE OF FORMOSA

LIST OF TABLES

LIST OF FIGURES

THE WEATHER AND CLIMATE OF FORMOSA

INTRODUCTION

The climate of Formosa may be characterized as subtropical. In summer, when the southwest *monsoon* blows, the weather is hot and frequent and heavy showers occur; in winter, when the northeast *monsoon* blows, the weather is cool and dry on the west side, while low clouds and rain prevail on the exposed north and east sides.

The weather is generally suitable for aerial operations at all seasons everywhere on the island except the northeast side. Low ceilings and poor visibility occur chiefly during the intense summer showers, and in the northeast *monsoon* air as it moves up the steep mountain slopes on the eastern side of the island.

MAJOR CONTROLS OF WEATHER

The weather of Formosa is controlled by the monsoonal circulation of air between the Asiatic continent and the North Pacific Ocean. From October through March, winds blow in a clockwise direction out of the region of high pressure in Siberia, and the resulting air flow over Formosa is from the northeast. Since this air comes from Siberia by way of the East China Sea, it is cool and moist by the time it reaches Formosa.

Sometime during April or May, there is a pronounced reversal of direction of air flow. The winds shift from northeast to southwest, and for the following four or five months the air flow over Formosa is a part of the clockwise circulation around the center of high pressure in the North Pacific Ocean. The air that arrives over Formosa in the months of June through August has had a long history over tropical seas and is, therefore, very warm and humid. When this tropical maritime air becomes heated over land during the daytime, convectional showers and thunderstorms result.

The weather of the months of April, May, and September is a combination of the prevailing weather of the northeast and of the southwest *monsoon* seasons. During these transitional months, the direction of air flow usually alternates several times between northeast and southwest.

On figures 6, 7, and 8, are shown, by means of direction-frequency roses, frequencies of air flow from eight directions for the east and west sides of Formosa during the winter *monsoon* season, the summer *monsoon* season, and the transitional months.

LOCAL CONTROLS OF WEATHER

Topography

The topography of Formosa (see fig. 1) has a pronounced effect on local weather Sharp variations in direction of air flow are caused by the ridge of mountains trending north-northeast to south-southwest the entire length of the island. The mountains rise abruptly from the sea along the east side of the island, and reach elevations of 11,000 feet

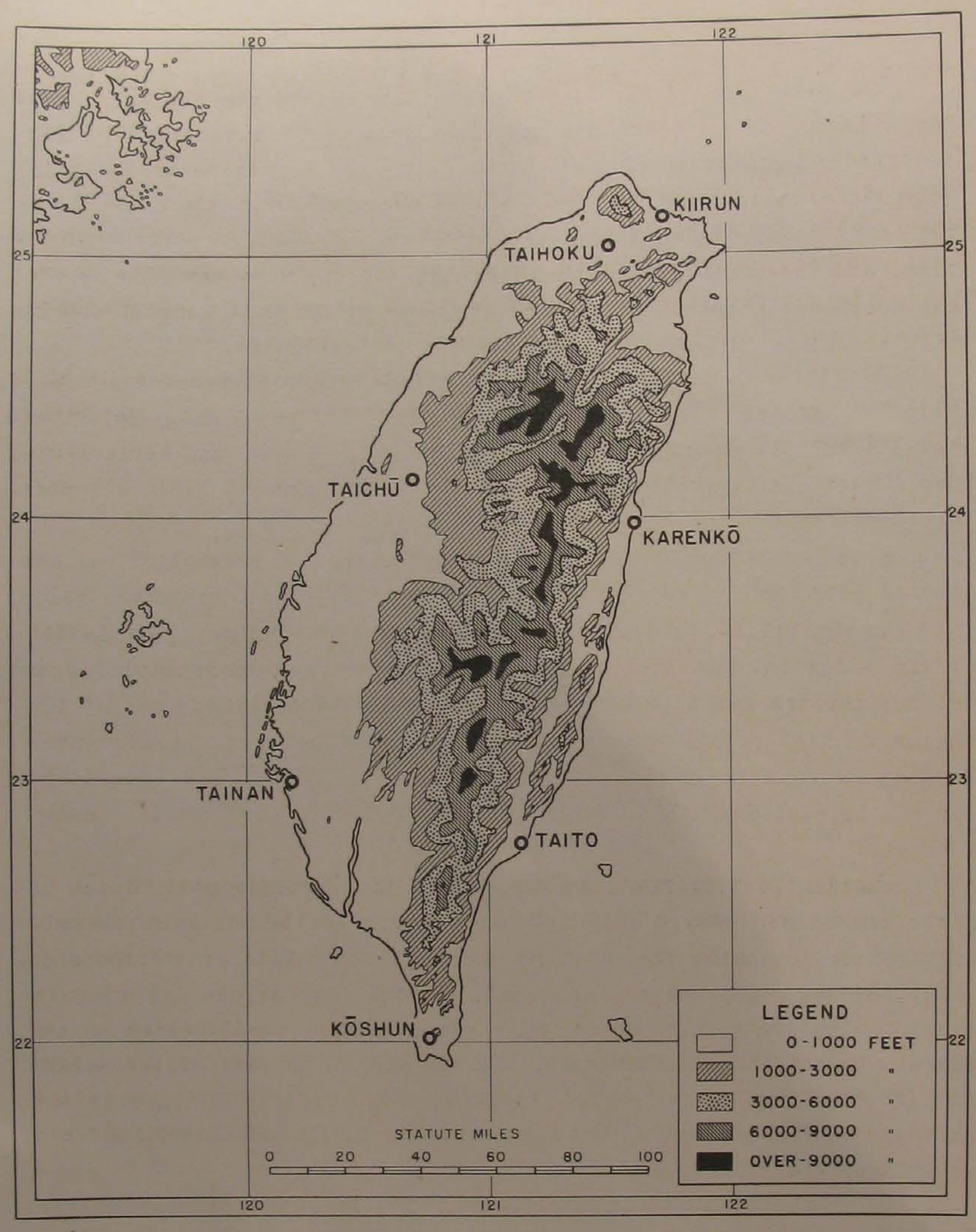


Figure 1.--Map of Formosa showing Topography and Location of Stations

or more within 25 miles of the coast. The western half of the island is an extensive plain, sloping seaward from foothills about 1000 feet in elevation.

As the prevailing northeast or southwest current of air moves up the windward slope of the mountains, the moisture in the air is condensed to form clouds and rainfall. The air moving downslope on the leeward sides is dry and warm. Thus, the north and east sides of the mountains of Formosa are cloudy and rainy in winter, while the west side of the island has relatively little cloud and is warmer than the east. Conversely, during the southwest *monsoon*, the west side has the greatest amount of cloudiness and rainfall, while the east side frequently experiences hot, dry *foehn* winds and clear skies.

AVERAGE WEATHER CONDITIONS

The direction of air flow over Formosa determines the weather on the island. Since there are only two pronounced directions of flow (see the frequency roses on figures 6, 7, and 8), there are actually only two seasons. One is from October through March, when the direction of free-air flow is from the northeast at least 50 percent of the time, and the other is from June through August, when the flow is from the southwest about 40 percent of the time on the west side of the island and about 20 percent of the time on the east side.

Averages of weather phenomena reflect the conditions associated with the two predominant directions of flow. Figures 2 and 3 illustrate the average conditions of precipitations, cloudiness, and surface wind for January, a typical northeast *monsoon* month, and for July, a typical southwest *monsoon* month.

Detailed tables giving average temperature and precipitation, number of clear and cloudy days, number of days with thunderstorms, gales, and precipitation, and prevailing direction and velocity of surface winds, together with a list of seven stations and their location and elevation, are found at the end of this discussion.

Season of the Northeast *Monsoon*
(October through March)

During the northeast *monsoon* season, the northern part of the island has a great many cloudy and rainy days. In the months of December through March, there are about 20 days each month with an average cloud of eight-tenths or more at Karenkō, Kiirun and Taihoku. During the same months, more than one day with clear sky per month seldom occurs. Stratus type clouds predominate. On the northeast part of the island, their bases may be as low as 200 feet, and they may persist at this level for several days. Ceilings between 2,000 and 3,000 feet are, however, more usual.

In contrast to the northern and eastern sides of Formosa, the southern, and particularly the southwestern, side has many clear days and very little rainfall during the northeast *monsoon* (see figure 2). From October through February, Taichū, Tainan, and Koshun have from four to nine days with less than two-tenths cloudiness each month.

One of the outstanding characteristics of the winter season on Formosa is the high frequency of gales, winds with velocity over 22 m.p.h. (see figure 4). These high winds are particularly frequent at coastal stations such as Kōshun, where there are, on the average, 22 days during December with winds over 22 m.p.h. On 13 of these days, velocities exceed 34 m.p.h.

Minimum temperatures are never below freezing during the winter months except at elevations above about 3,500 feet. The usual daily minimum temperatures of January and February are between 50° F. and 60° F. Snow lies on the mountains above 10,000 feet from December through February, and occurs occasionally down to elevations of 3,500 feet.

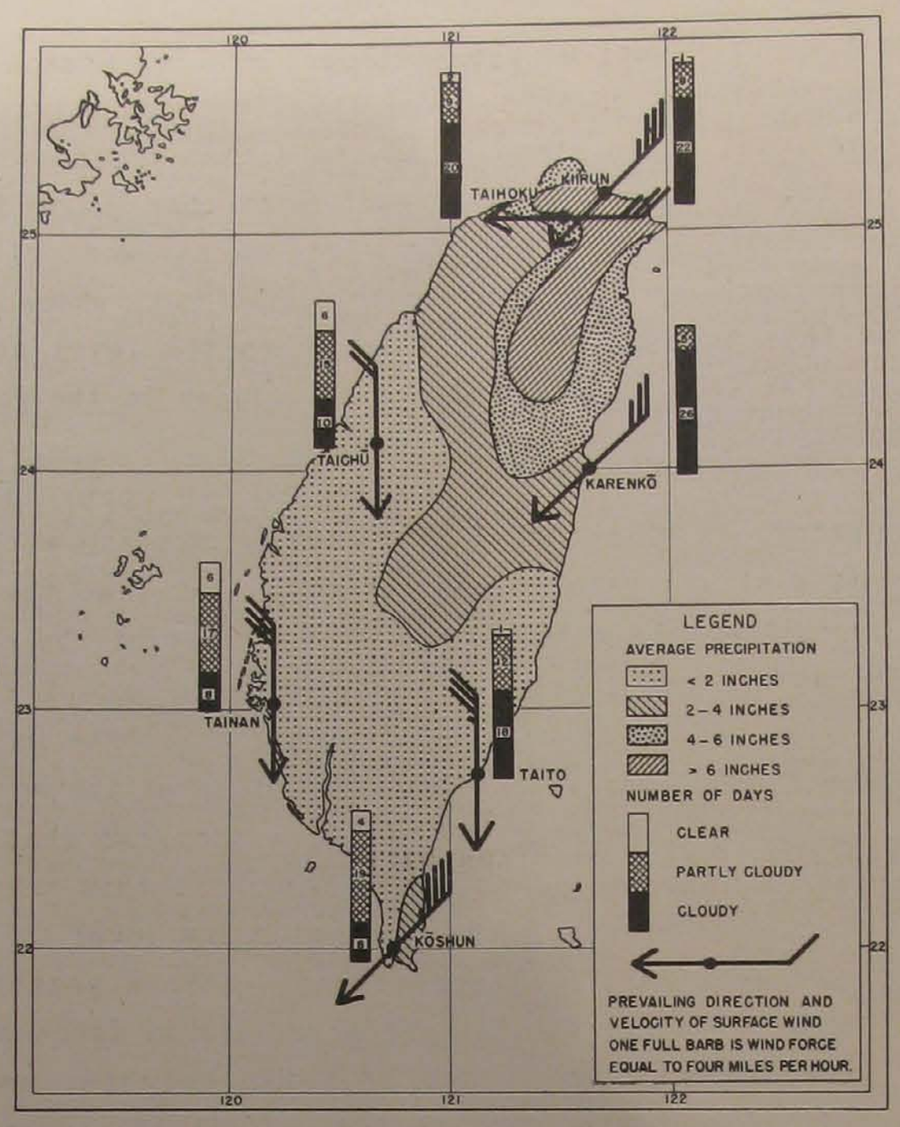


Figure 2.—Average Precipitation, Cloudiness, and Surface Winds for January

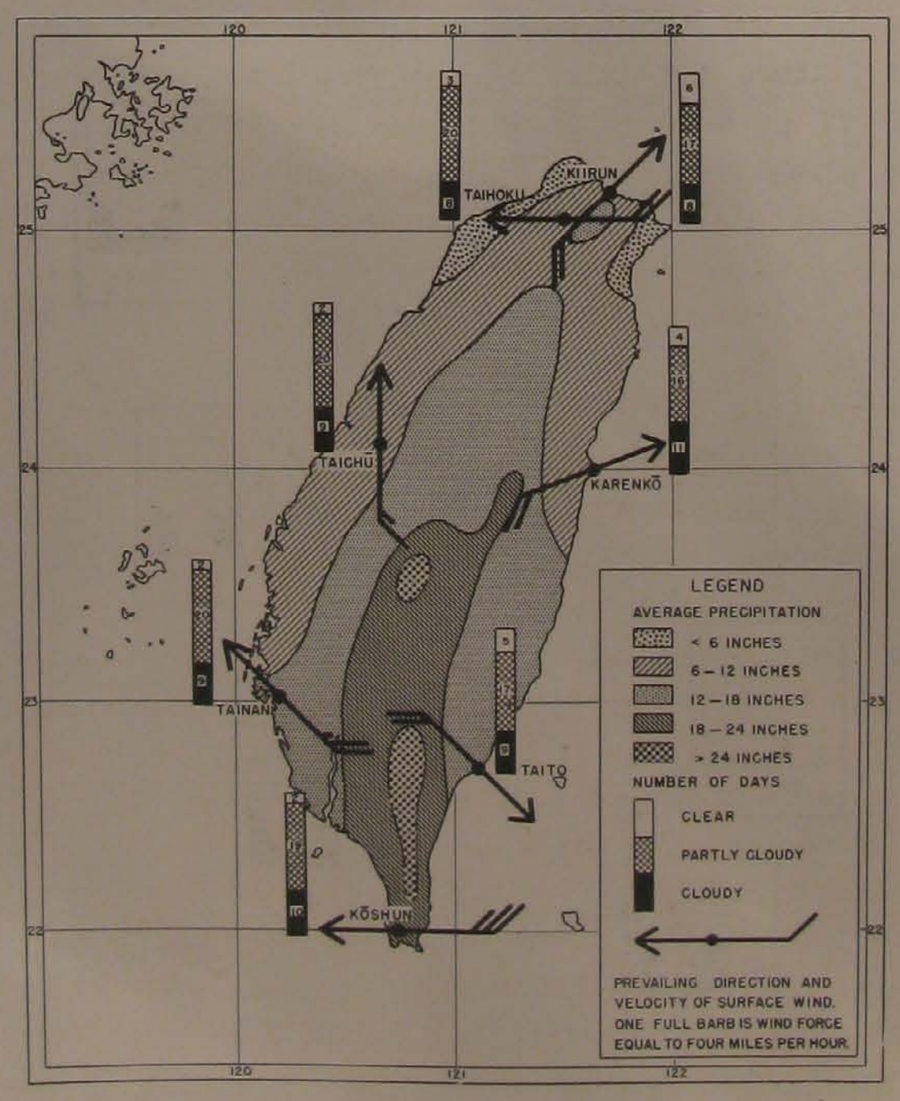


Figure 3.--Average Precipitation, Cloudiness, and Surface Winds for July

During the early part of the northeast *monsoon* season, the upper winds are northeasterly up to a level lying between 6,000 and 12,000 feet, but this level falls steadily as the season progresses, until in April the northeast current is not much more than 2,000 feet thick. Above the northeasterly current, the winds become westerly. Average wind velocities increase gradually up to 1,800 feet, where they are 22 m.p.h. From this level, they decrease up to the level at which the westerly winds set in. At 10,000 feet, velocities in the westerly current are approximately 30 m.p.h.

Upper-air temperatures decrease up to the upper limit of the northeast current, at which level they either increase with elevation or decrease at a slower rate. This inversion level at the top of the northeast current usually marks the upper boundary of the cloud layer. Icing conditions are not likely to be encountered except when the top of the cloud layer is around 10,000 feet. Although this is most likely to occur in November or early December, the depth of the northeast *monsoon* varies considerably during the winter season, so that the possibility of icing on aircraft is present throughout this season. Icing can always be avoided, however, by flying at a low level.

During the early part of the northeast *monsoon* season, that is, from October to December, visibility from the air is frequently reduced by haze which often extends to considerable heights, sometimes to 10,000 feet. It is probable that the upper limit of the haze is associated with the temperature inversion that marks the upper limit of the northeast *monsoon*.

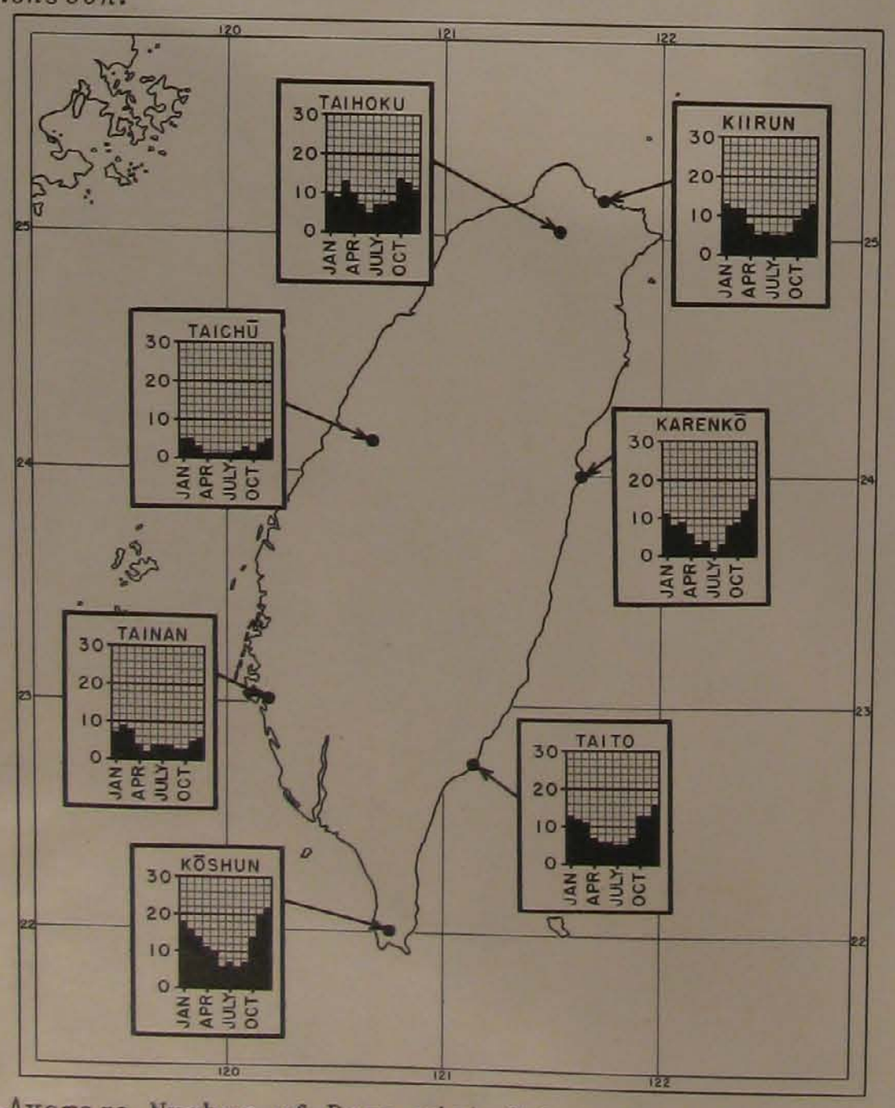


Figure 4.--Average Number of Days with Gales (Wind Velocity of 22 m.p.h. or Greater

Season of the Southwest *Monsoon*
(June through August)

When the southwest *monsoon* sets in--usually during May--the amount of cloud on the Pacific side of Formosa decreases. July is the least cloudy month at Karenkō, Taihoku, and Taito (see figure 3). Kiirun has, on the average, 6 clear days in July, and Taito, 5. Stations on the south and west sides, however, have their greatest amount of cloud at this season, and rarely have more than 2 clear days a month. At Tainan it rains on about half the days of July. As many as 15 inches of rain have fallen in a 24-hour period.

Most of the cloudiness is the result of convective activity in the unstable, tropical marine air, and is least, therefore, during the early morning hours. The rains come in the form of heavy intermittent showers. Over 12 inches of rain fall on the southern half of the island in July.

A prominent feature of the southwest *monsoon* season is the high incidence of thunderstorms. The number of these occurring each month is shown by the bar graphs in figure 5. Taichū has approximately 13 thunderstorms each July, and Tainan, 11.

The southwest *monsoon* is usually fully established by the beginning of June. It is, however, never as strong or as constant as the northeast *monsoon*, and, in the surface levels, is often subordinate to mountain and valley breezes and land and sea breezes. Although the height to which the southwest current extends varies considerably from

Figure 5.--Average Number of Days with Thunderstorms

day to day, the average depth is 5,000 feet. Above this level, the wind backs or veers gradually to easterly or southeasterly at about 10,000 feet. In July, the wind velocity at all levels in the southwesterly current is approximately the same as it is at the surface.

BOMBING WEATHER

In general, the weather over Formosa is favorable for bombing operations. Because of the rugged topography and the extreme seasonal changes in direction of air flow, the average frequency with which favorable conditions occur varies with respect to location and time of year.

Figures 6, 7, and 8 present data compiled from a study of three years of weather conditions on Formosa. They show the percentage frequency of weather favorable for high- and low-level bombing and for low-level bombing only, and the percentage unfavorable for either type of operation. The frequencies are given for the seasons of the northeast *monsoon*, the southwest *monsoon*, and the transitional months.

The criteria used are as follows:

A day favorable for both high- and low-level bombing is defined as one with less than four-tenths cloud cover.

A day favorable for low-level bombing only is defined as one with broken to overcast high or middle clouds.

A day unfavorable for bombing operations is defined as one with broken to overcast sky and nimbus or cumulonimbus clouds, a stratus overcast, fog, or rain.

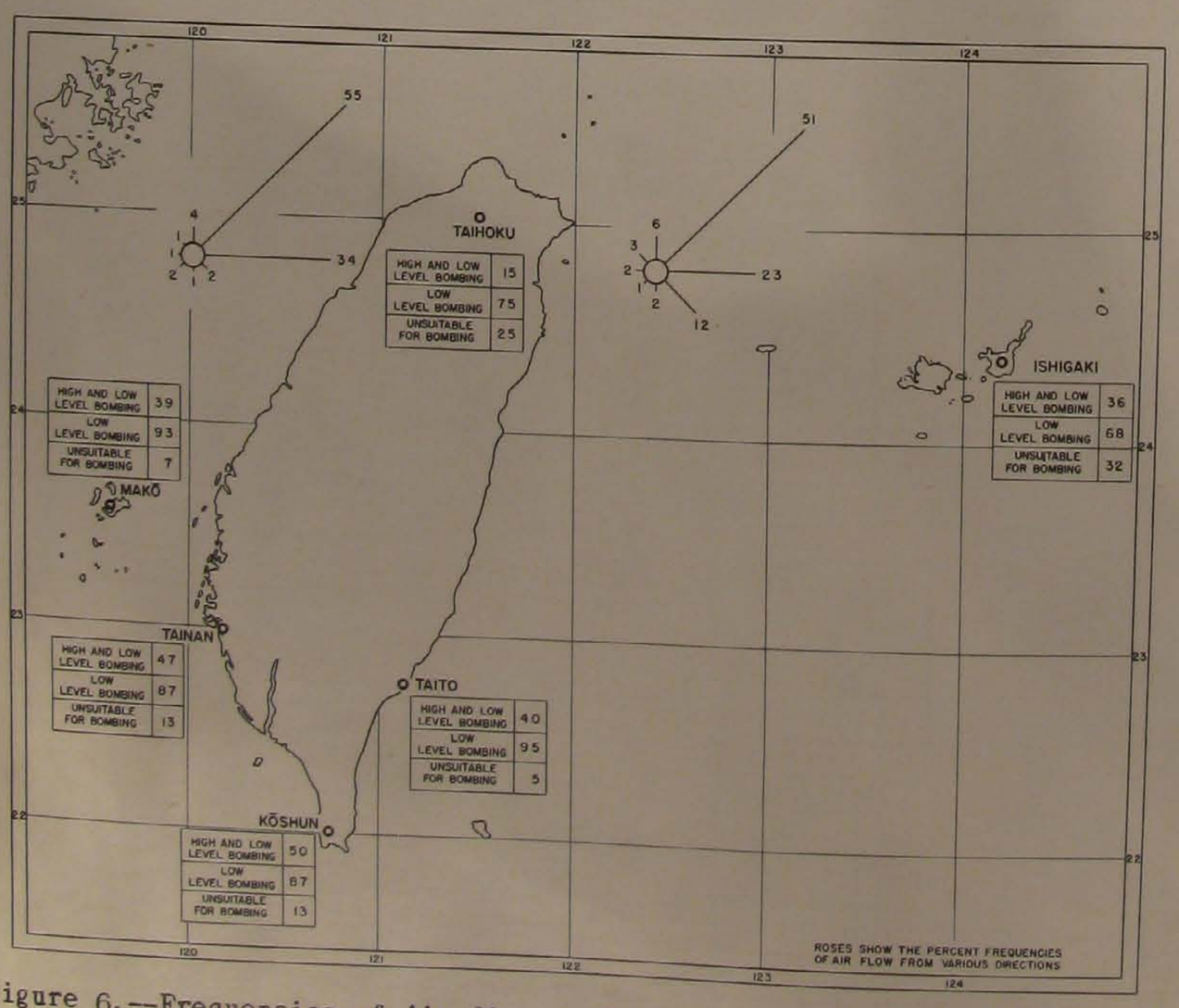


Figure 6.--Frequencies of Air-flow by Directions, and Percentage of Days Suitable for Bombing, October through March

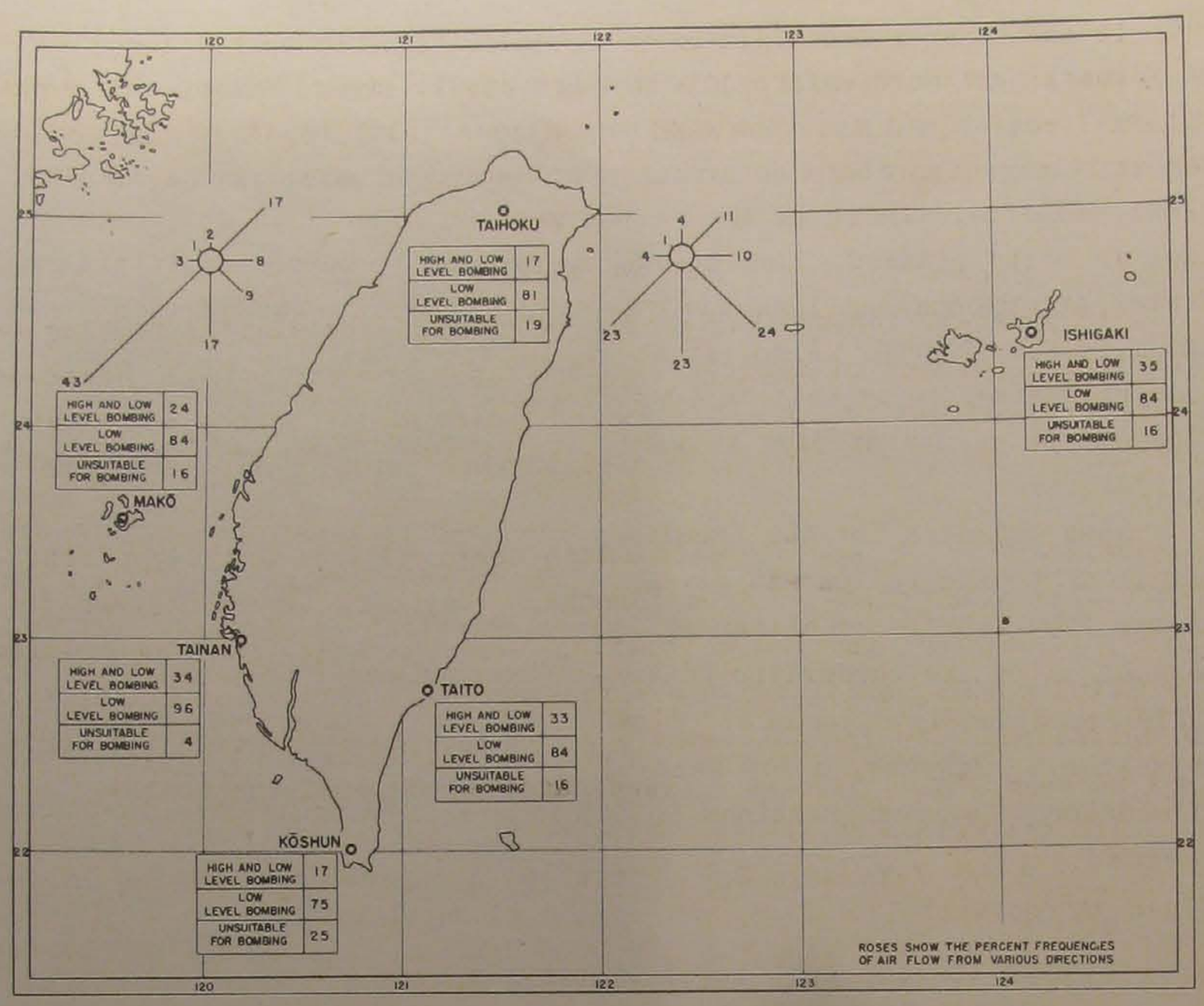


Figure 7.—Frequencies of Air-flow by Directions, and Percentage of Days Suitable for Bombing, June through August

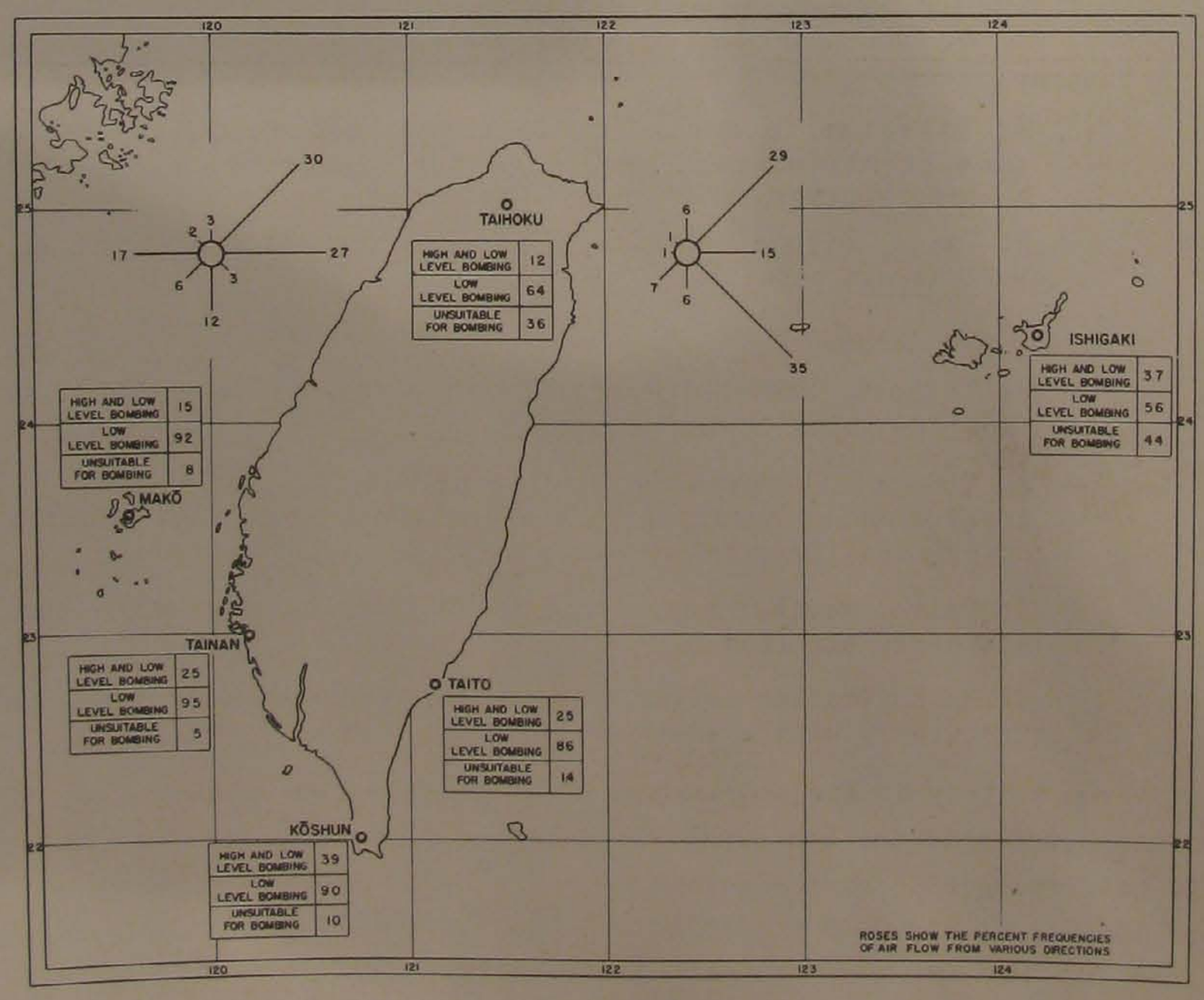


Figure 8.--Frequencies of Air-flow by Directions, and Percentage of Days Suitable for Bombing, April, May, and September

It can be seen from figures 6, 7, and 8 that the northern portions of Formosa have more unfavorable weather in winter and during the transitional months and that the southern tip is least favorable for bombing in summer. As these determinations were made from morning observations, some adjustment in the values must be made if an afternoon attack is being planned. Conditions would tend to be more favorable on winter afternoons and less favorable on summer afternoons than those shown in the figures. Also, it should be noted that the frequencies of bombing weather refer only to conditions on Formosa and give no indication of the number of days suitable for operations to the island from outside bases.

When the data for the frequency roses of figures 6, 7, and 8 were compiled, consideration was given to the correlation between direction of air flow and the resultant weather at stations on Formosa. Because Formosa is on the borderline between temperate and tropical latitudes, differences in direction of air flow do not result in marked differences in weather. However, a few general rules expressing the relationship of weather at various stations to air flow at various seasons have been deduced.

Winter

At Kōshun, high-level bombing is possible about 50 percent of the time with air flow from northeast to east, and about 12 percent of the time with air flow from the north.

At Taihoku, free-air flow from the east permits high-level bombing 33 percent of the time.

Summer

At Ishigaki, a northerly flow breaking into the summer (southwest) *monsoon* increases the chances of high-level bombing weather.

At Taito, with a northerly flow some type of bombing is almost always possible.

Spring and Autumn

At Taihoku, over 50 percent of the days with northeast air flow are suitable for bombing.

At Tainan, the greatest number of days suitable for high-level bombing occurs with southerly air flow. Bad weather occurs usually with northerly flow.

At Taito, weather unsuitable for bombing rarely occurs with southerly air flow.

At Hokō, weather suitable for high-level bombing occurs most frequently with a southwesterly air flow.

From a study by Kuzuo Ogasahara ("On the Mechanism of Formation of Summer Squalls in the Southwest Plain Region of Formosa for the Synoptic Meteorologist," *Jour. Tropical Agri.*, April 1939 (vol. XI, no. 1), pp. 15-56), it has been possible to extract a few outstanding correlations for the southwest *monsoon* season between surface winds at 0600 L.C.T. at Pratas and at Shanghai and the weather on Formosa during the 24 hours from 1100 L.C.T. to 1100 L.C.T. the following day. These correlations are given in table 1.

Table 1.--Type of Bombing Weather at Formosa with Various Directions of Surface Wind at Pratas and at Shanghai

(Source of data: "On the Mechanism of Formation of Summer Squalls in the Southwest Plain Region of Formosa for the Synoptic Meteorologist." *Jour. Tropical Agri.*, vol. XI, no. 1, pp. 15-56, April 1939)

Month	Surface Wind Direction 0600 L.C.T.	Bombing Weather on Formosa 1100 L.C.T.-1100 L.C.T. following day
AT PRATAS		
May	N., SSE., WSW., NW.	Poor*
June	ESE., ENE.	Good**
July	N., NE., WSW., WNW., SW.	Poor*
Aug.	SSW., NW., NNW.	Poor*
Sept.	N., NE., SSW.	Poor*
Oct.		
AT SHANGHAI		
May	WSW.	Poor*
June	WSW.	Poor*
July	ESE.	Poor*
Aug.	WNW., WSW., and E. thru NNE.	Poor*
Sept.	ENE., WSW.	Poor*

** Poor: precipitation from 75 to 100 percent of the time.*

***Good: no precipitation from 75 to 100 percent of the time on the western half of the island only.*

A series of typical weather charts for the Formosan region are presented below (figs. 9-13). These maps are not intended to represent normal situations over Formosa, but to depict situations whose resultant weather was more uniform than usual. Captions under each chart indicate the bombing weather associated with each type illustrated.

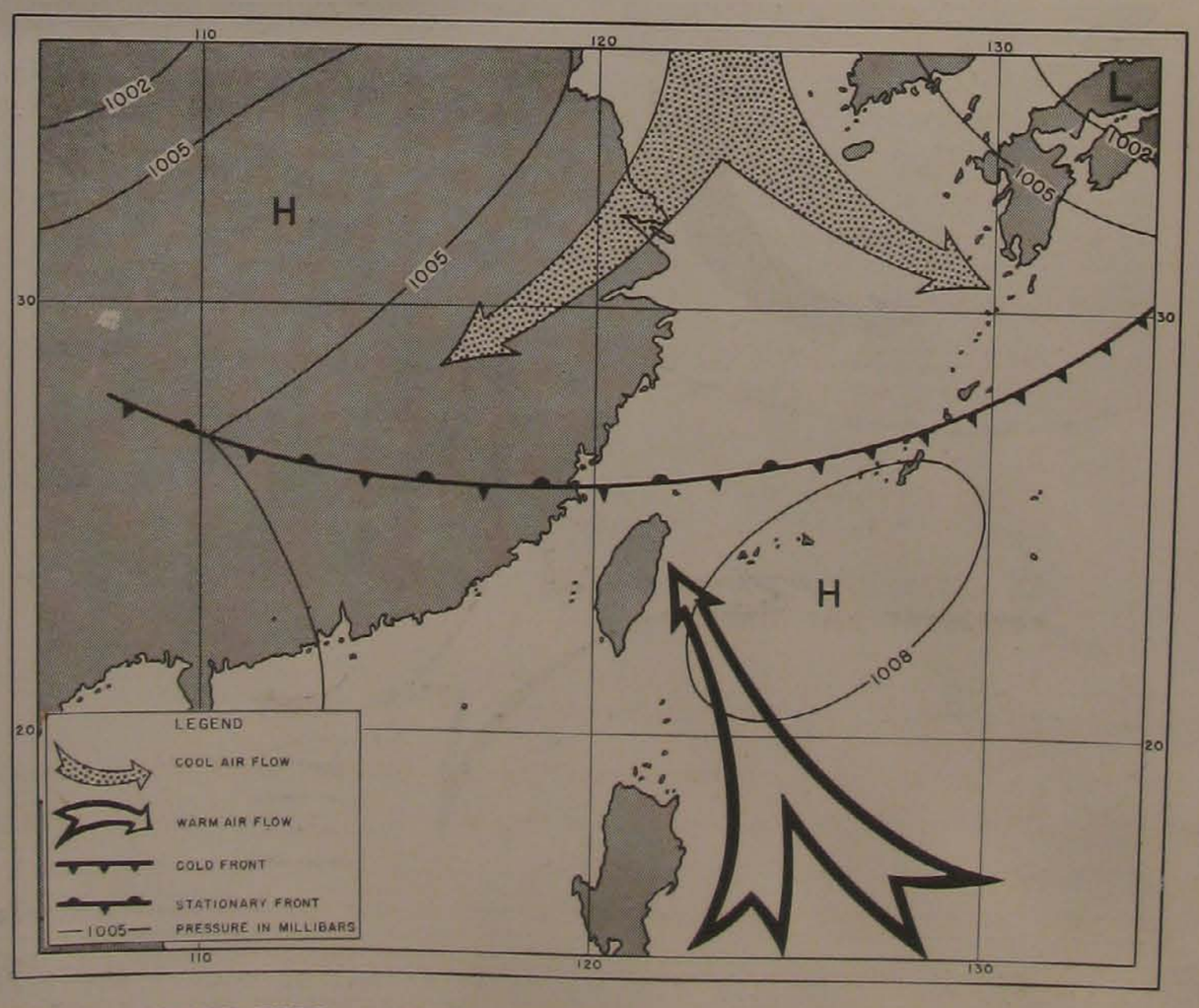


FIGURE 9, SUMMER TYPE - GOOD WEATHER--This situation usually results in several days suitable for high- and low-level bombing. If the front penetrates any farther southward, conditions rapidly deteriorate.

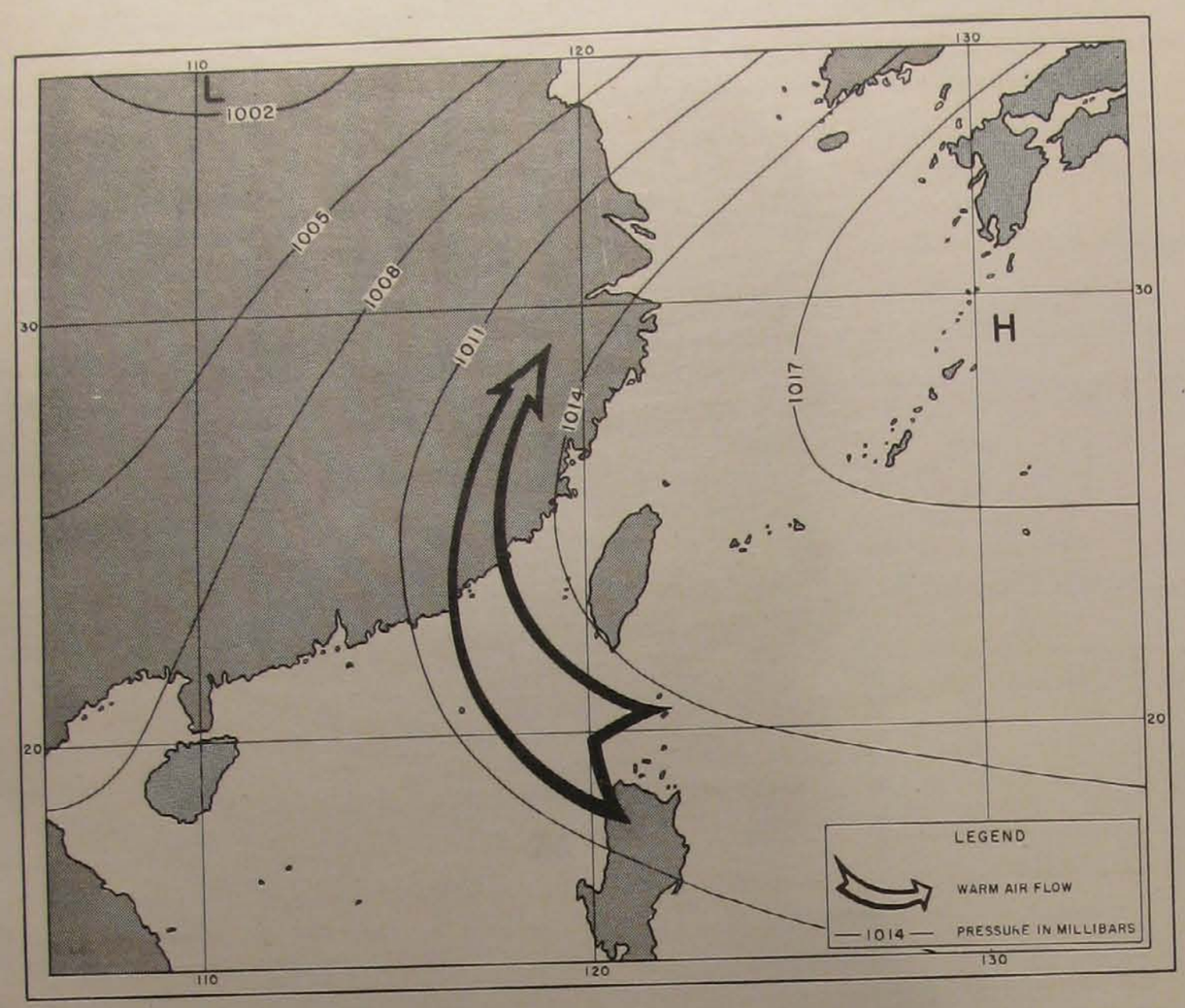


FIGURE 10, SUMMER TYPE - GOOD WEATHER--This situation brings good weather when a *low* passes to the north of Formosa along the normal path of the extratropical cyclones. The predominantly clear conditions last from two to four days.

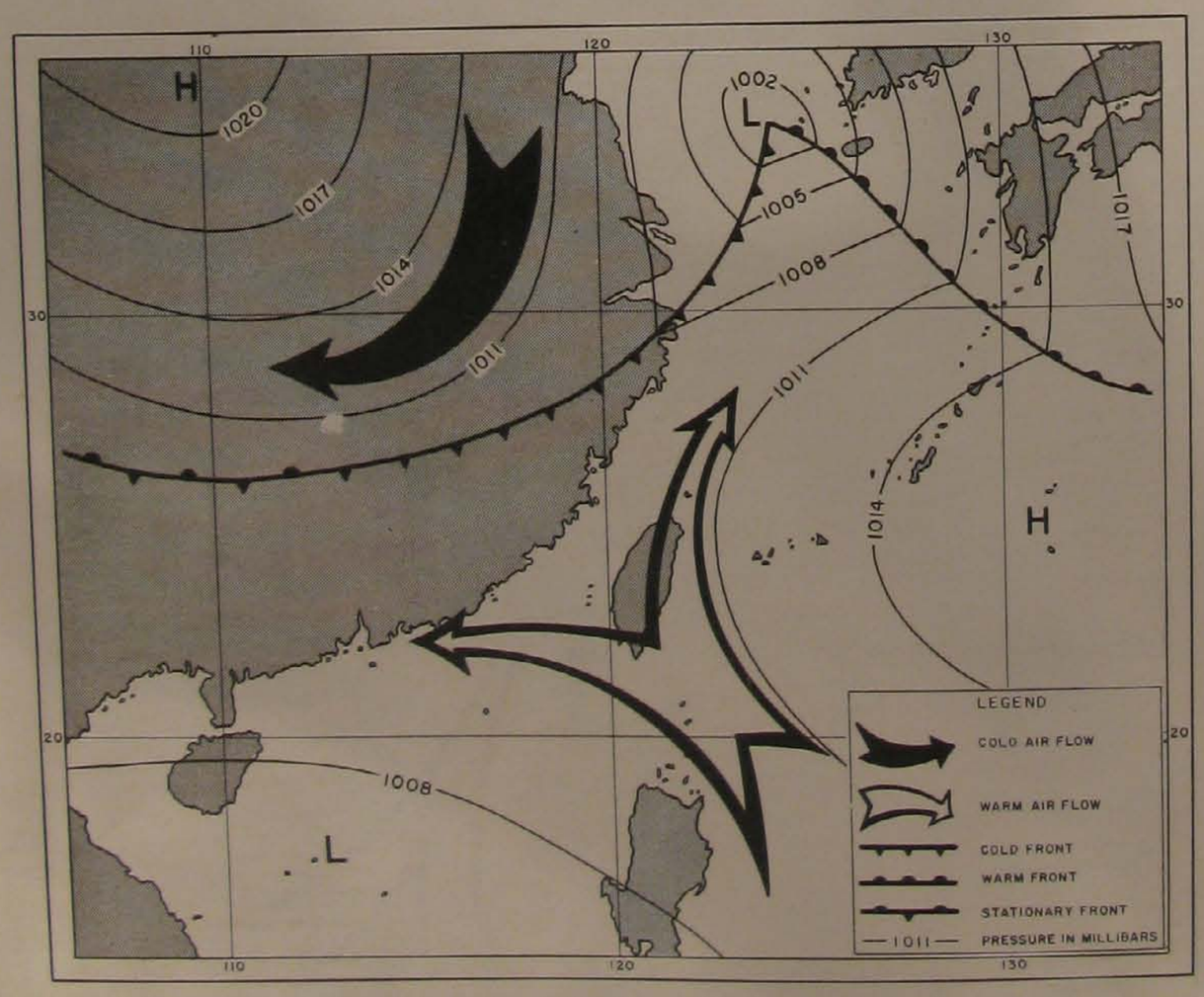


FIGURE 11, WINTER TYPE - GOOD WEATHER--This situation occurs about four times during the winter season, causing an intrusion of trade-wind air over Formosa. The good weather usually lasts from one to two days. This situation normally develops rapidly into a type of bad winter weather.

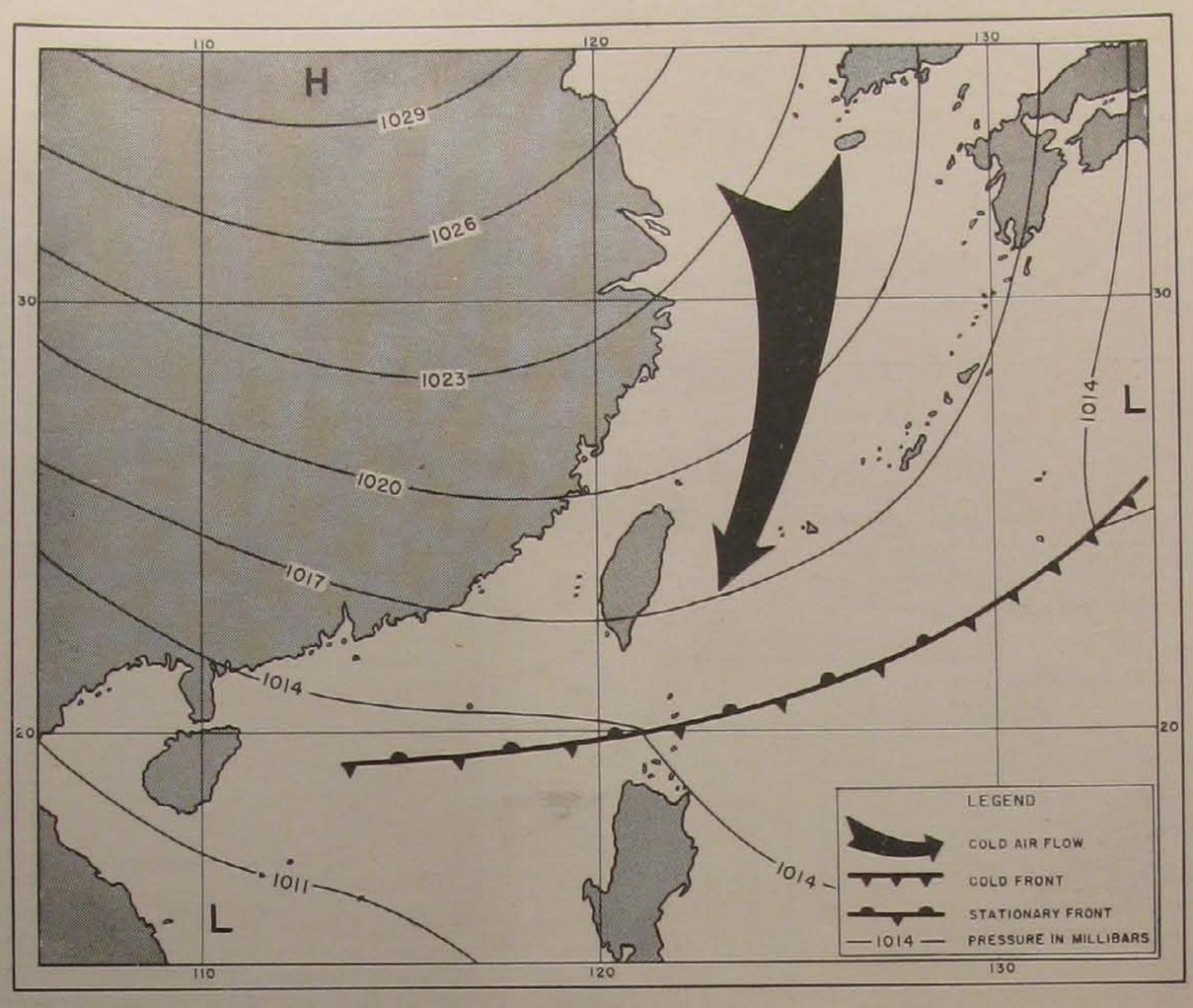


FIGURE 12, WINTER TYPE - BAD WEATHER--This situation is common during the winter months. It is characterized by an unbroken flow of cold air from Siberia. In this situation, conditions suitable for high-level bombing are very rare.

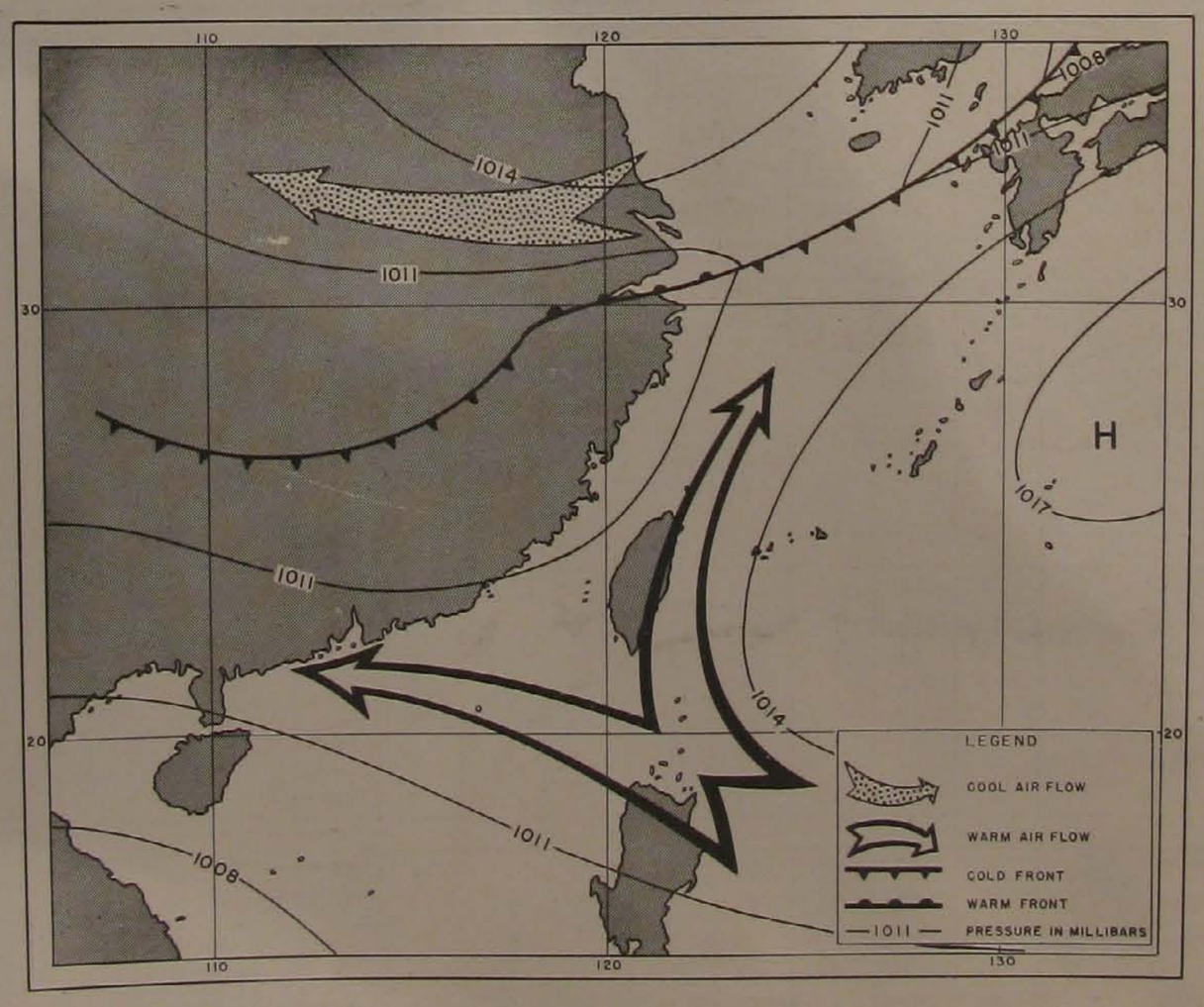


FIGURE 13, SPRING AND AUTUMN TYPE - GOOD WEATHER--Situations which are generally favorable for all types of bombing over most of the island during the transition months are associated with a frontal configuration of this type. The periods of good weather usually last several days.

Table 2.--List of Stations*

Station	Latitude	Longitude	Elevation (Ft.)
Karenkō	23° 58' N.	121° 36' E.	63
Kiirun (Keelung)	25 08	121 44	11
Kōshun	22 02	120 45	78
Taichū	24 08	120 42	256
Taihoku	25 02	121 31	30
Tainan	23 00	120 11	47
Taito	22 46	121 08	33

* *Spelling and location of stations approved by U. S. Board on Geographical Names.*

Table 3.--Mean Maximum and Mean Minimum Temperatures (°F.)

Station	Yrs. Rec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum Temperature													
Karenkō	8	71	70	73	77	83	86	89	88	86	82	77	73
Kiirun	14	65	64	67	74	79	86	89	88	85	79	72	66
Kōshun	30	75	76	80	84	87	87	88	87	87	84	80	76
Taichū	30	71	70	74	80	86	89	90	90	89	85	80	74
Taihoku	30	66	65	70	77	83	89	92	91	88	81	74	69
Tainan	30	74	74	79	84	87	89	90	89	89	87	82	76
Taito	29	74	74	77	81	85	88	89	89	87	83	79	75
Minimum Temperature													
Karenkō	9	59	58	61	65	70	73	74	74	72	68	63	60
Kiirun	14	56	55	58	64	69	74	76	76	74	70	64	59
Kōshun	30	64	63	67	71	74	76	77	76	75	73	70	66
Taichū	30	53	52	58	65	70	74	75	75	73	67	61	55
Taihoku	30	54	53	57	63	69	73	76	75	73	68	62	57
Tainan	30	55	54	60	66	72	75	76	76	74	69	63	57
Taito	29	60	60	63	67	71	74	75	75	73	70	66	62

Table 4.--Mean Number of Days with Thunderstorms, Gales (velocity over 22 m.p.h.), and Precipitation (over 0.004 in.)

Station	Yrs. Rec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Thunderstorms													
Karenkō	3	0	1	1	2	3	4	3	5	3	*	0	0
Kiirun	14	1	1	2	3	3	6	5	4	3	1	0	*
Kōshun	17	1	*	1	2	5	4	6	6	4	2	*	*
Taichū	17	1	1	2	3	4	9	13	12	5	1	0	*
Taihoku	17	1	1	3	3	4	8	11	9	6	1	*	*
Tainan	17	1	1	1	2	4	7	11	10	8	1	*	*
Taito	13	1	0	1	2	5	3	4	5	4	1	*	*
Gales													
Karenkō	3	11	8	9	6	3	4	1	3	8	9	12	15
Kiirun	14	13	12	12	8	5	6	5	5	6	9	12	13
Kōshun	17	18	16	14	11	10	6	7	6	7	14	20	22
Taichū	17	5	5	3	1	1	1	1	2	3	2	4	5
Taihoku	17	10	9	13	10	7	5	7	7	8	14	13	11
Tainan	17	7	9	8	4	2	4	4	4	3	3	5	6
Taito	13	13	12	11	7	6	6	5	5	7	13	13	16
Precipitation													
Karenkō	7	20	20	19	20	22	19	12	14	17	13	15	15
Kiirun	14	22	21	23	19	19	14	11	14	17	20	22	23
Kōshun	30	9	7	7	8	13	18	20	22	17	12	9	8
Taichū	30	8	10	12	11	13	16	15	18	9	4	5	7
Taihoku	30	16	17	17	15	16	15	14	15	14	15	15	16
Tainan	30	5	6	6	8	10	15	16	19	11	5	4	4
Taito	29	11	10	13	15	19	13	13	14	15	13	10	10

* *Less than 0.5 day*

Table 5.--Mean Monthly Precipitation and Maximum Precipitation in 24 Hours, in Inches

Station	Yrs. Rec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Precipitation													
Karenkō	8	2.3	4.5	4.1	7.6	10.7	7.0	10.6	8.7	12.8	9.0	3.3	2.2
Kiirun	14	13.9	11.8	13.9	7.6	12.1	8.7	5.8	6.9	10.9	10.8	13.0	15.4
Kōshun	30	0.9	1.1	0.9	2.1	7.4	14.4	17.3	21.4	11.1	6.2	1.4	0.7
Taichū	30	1.4	2.6	3.9	5.0	9.5	13.4	10.5	12.9	6.2	1.0	0.8	0.9
Taihoku	30	3.4	5.3	6.7	6.4	8.9	11.1	8.2	11.8	10.2	5.3	2.7	3.0
Tainan	30	0.9	1.5	1.6	2.5	7.4	13.5	12.7	16.8	6.5	1.4	0.7	0.5
Taito	29	1.7	1.7	2.3	3.1	7.0	7.9	14.7	11.8	10.6	7.1	2.0	1.5
Maximum Precipitation in 24 Hours													
Karenkō	8	1.8	2.3	1.9	5.5	9.1	3.6	6.6	11.8	11.4	10.0	2.0	1.6
Kiirun	14	3.8	3.5	3.7	4.4	10.4	6.3	7.9	5.6	5.6	7.0	6.8	7.1
Kōshun	30	1.5	3.7	4.4	4.4	15.0	10.7	16.1	15.6	9.6	9.0	3.3	1.3
Taichū	30	3.5	2.3	3.4	5.3	5.6	11.2	12.0	16.2	11.6	8.1	2.4	1.3
Taihoku	30	2.0	2.3	2.8	4.6	6.2	7.8	7.5	11.3	9.1	7.8	2.2	3.1
Tainan	30	4.0	3.9	3.4	4.0	10.0	9.4	9.7	15.2	15.0	3.1	1.7	1.4
Taito	29	2.6	2.2	2.1	3.4	6.6	10.7	18.4	16.3	8.7	9.5	4.4	3.9

Table 6.--Mean Number of Clear Days (≤2 tenths cloud cover) and Cloudy Days (≥8 tenths cloud cover)

Station	Yrs. Rec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clear Days													
Karenkō	8	0	*	*	1	1	1	4	2	1	1	1	*
Kiirun	14	1	1	1	1	2	2	6	5	5	2	1	1
Kōshun	30	4	4	3	4	2	2	2	2	3	4	5	4
Taichū	30	6	5	3	2	2	2	2	2	5	9	9	8
Taihoku	30	2	2	1	1	2	1	3	4	6	4	3	2
Tainan	30	6	5	5	5	5	2	2	2	4	8	7	7
Taito	29	1	*	1	1	1	3	5	3	3	2	1	1
Cloudy Days													
Karenkō	8	26	23	24	23	21	16	11	13	15	19	20	22
Kiirun	14	22	22	23	19	19	14	8	8	11	18	23	24
Kōshun	30	8	5	7	7	10	11	10	14	9	8	8	9
Taichū	30	10	11	13	12	12	12	9	11	6	6	7	8
Taihoku	30	20	19	21	18	16	14	8	9	9	15	17	19
Tainan	30	8	8	9	8	10	11	9	12	6	6	7	8
Taito	29	18	18	19	17	17	11	9	11	11	13	14	18

** Less than 0.5 day*

Table 7.--Prevailing Surface Wind Directions and Velocities (m.p.h.)

Station	Yrs. Rec.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Prevailing Direction													
Karenkō	3	NE	NE	N	N	N	W	SW/W	SW	N	NE	N/NE	NE
Kiirun	14	NE	N/NE	N/NE	N/NE	NE/E	SW	SW	E/SW	E	NE	NE	NE
Kōshun	17	NE	NE	NE	NE	NE	W	E	E	NE	NE	NE	NE
Taichū	17	N	N	N	N	N	S	S	S	N	N	N	N
Taihoku	17	E	E	E	E	E	E	E	E	E	E	E	E
Tainan	17	N	N	N	N	N	SE	SE	SE	N	N	N	N
Taito	13	N	N	N	NW	NW	NW	NW	NW	NW	N	N	N
Average Wind Velocity													
Karenkō	3	11	11	9	9	7	8	8	8	10	10	12	13
Kiirun	14	14	14	12	10	9	8	9	10	12	13	14	14
Kōshun	17	17	16	15	12	11	11	11	10	11	15	20	21
Taichū	17	8	8	7	6	5	6	6	6	6	7	7	8
Taihoku	17	11	11	12	11	10	8	8	10	10	13	13	12
Tainan	17	12	13	12	10	8	9	9	9	8	9	11	12
Taito	13	13	13	12	10	9	8	8	9	10	12	13	13

CLASSIFICATION S

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