

L

D C N 3

5

SECRET

ADFDA ARCHIVE  
LEDGER

No:

85

This Book is invariably to be kept locked up when not in use, and is not to be taken outside the ship or establishment for which it is issued without the express permission of the Commanding Officer

A.C.B. 0254/45 (1)

ROYAL AUSTRALIAN NAVY

MONTHLY NAVAL WARFARE REVIEW

JANUARY, 1945

*File reclassified as:*

**OPEN**

4/3/05





S E C R E T

to be kept locked

<b>THIS DOCUMENT HAS BEEN REVIEWED AND DECLASSIFIED</b>	
FILE REF: 2005/1023664/1	FOLIO 13
NAME: JOHN MADDOCK	DATE: 4/3/2005
SIGNATURE: <i>John Maddock</i> RG42/105	

A.C.B. 0254/45 (1)

**OPEN**

ROYAL AUSTRALIAN NAVY

MONTHLY NAVAL WARFARE REVIEW

JANUARY, 1945

TRAINING AND STAFF  
 REQUIREMENTS DIVISION,  
 NAVY OFFICE,  
 MELBOURNE.



S E C R E T

This Book is invariably to be kept locked up when not in use, and is not to be taken outside the ship or establishment for which it is issued without the express permission of the Commanding Officer

A.C.B. 0254/45 (1)

ROYAL AUSTRALIAN NAVY  
MONTHLY NAVAL WARFARE REVIEW

JANUARY, 1945

TRAINING AND STAFF  
REQUIREMENTS DIVISION,  
NAVY OFFICE,  
MELBOURNE.





## CONTENTS

### Section I.

#### CURRENT EVENTS IN SOUTH WEST PACIFIC

1. Liberty Ship Torpedoed off Montague Island
2. U-Boat Attacks Greek Merchant Ship off South Australian Coast
3. Latest Assessment of Losses in Philippines Fleet Action
4. U-Boat Operations in the South West Pacific December, 1944

### Section II.

#### OPERATIONAL AND TRAINING

1. Allied Submarines Allocated for A/S Training off Sydney
2. Allocation of Australian Escort Vessels in Forward Areas
3. P.P.I. Radar

### Section III.

#### NARRATIVES

1. Japanese Carrier Operations since Pearl Harbour
2. H.M.A.S. "NORMAN" Bombards Car Nicobar Island
3. Pearl Harbour - the Planning Stage

Section IV.

INTELLIGENCE

1. New Japanese Echo-Ranging Equipment
2. "YAMATO" Class Battleship
3. Japanese Ship Radar
4. German Submarine Developments
5. Radar in Japanese Destroyer "ASAGUMO"
6. Sidelight on Suicides

Section V.

MISCELLANEOUS

1. Meteorological Influences on Radar
2. Anti-Submarine Weapons in Use by Fleet Air Arm and Coastal Command Aircraft.
3. No "Knuckles" at Deep Submergence
4. German and Japanese Submarine Operations

Section VI.

MATERIEL

1. C.A.F.O's on Anti-Submarine Subjects

Section VII.

SHIPPING STATISTICS FOR SOUTHWEST PACIFIC

1. Convoys--October, November, 1944
2. Single Escorted Ships - October, November, 1944
3. Independent Vessels - October, November, 1944
4. Monthly Outward Gross Tonnage - October, November, 1944.
5. Shipping Sunk by Submarines of Australian Coast



ILLUSTRATIONS

P.P.I. "Pictures" of Milne Bay and Northern ...	Pages .. 9, 11
Entrance to China Strait	12 & 13
Sketches Showing Effects of Meteorological ...	Pages .. 38 &
Influences on Radar Detection	39





SECTION ICURRENT EVENTS IN SOUTH WEST PACIFIC1. LIBERTY SHIP TORPEDOED OFF MONTAGUE ISLAND.

At 0230K/25th. December, 1944, the American Liberty ship "ROBERT J. WALKER" (7,180 tons) on passage from Fremantle to Sydney, was struck by two torpedoes when in a position 025<sup>0</sup>, 95 miles from Gabo Island. A third torpedo missed at 0430K, but a fourth hit the ship at 0545K.

A quite formidable force of A/S fitted ships was in or between Melbourne and Sydney at the time, and all available ships were sent to the area. Captain (D)4 in H.M.S. "QUILLIAM" with H.M. Ships "QUADRANT" and "QUALITY" and H.M.A.S. "QUIBERON" left Melbourne at 28 knots followed by the Senior Officer 21st. M.S.F. in H.M.A.S. "BALLARAT" with H.M.A. Ships "GOULBURN" and "KALGOORLIE". H.M.A.S. "QUICKMATCH", which had just completed her refit, sailed from Sydney, M.L.s 822 and 829 and H.D.M.L. 1341 from Jervis Bay and M.L. 810 from Eden. The United States P.C. 597 left Sydney with a salvage officer on board and H.M.A. Ships "YANDRA" and "KIAMA" left from the same port, the former with salvage pumps on board and the latter with orders to stand by to tow if required. H.M.A.S. "HOBART" was at Jervis Bay commencing her shake-down period and was ordered to Sydney.

Aircraft were despatched by Eastern Area Headquarters and the Liberty ship was sighted at 0608 still afloat but with two empty lifeboats visible in the vicinity. The sea was rough and the visibility poor owing to dust storms.

At 1954K/25 P.C. 597 located the wreck and reported that its draught forward was minus ten feet and aft was sixty feet and that the weather deck was awash amidships. P.C. 597, acting under orders from N.O.I.C. Sydney, sank the wreck at 0300K on the 26th. "ROBERT J. WALKER" suffered two fatal casualties. None of the 67 survivors, who were all picked up by "QUICKMATCH", saw the U-Boat at any stage of the attacks.

By 0200/26 all five "Q" class destroyers were carrying out searches in the vicinity of the wreck and the three ships of the 21st. M.S.F. were en route to Jervis Bay carrying out a searching sweep for mines when in the vicinity of Gabo Island and off Green Point.



At 0945K/26 a Sikorsky aircraft on a test flight from Moruya to St. George Basin reported sighting a submarine close inshore about 50 miles south of Jervis Bay. This report was graded B.2 by the R.A.A.F.

On the 27th. the situation was that the five "Q" class destroyers had proceeded to Sydney after A/S and radar sweeps through the area, searches were being carried out by Beaufort and Sikorsky aircraft, H.M.A. Ships "WHYALLA", "BURNIE" and "MARYBOROUGH" had left Melbourne to join the 21st. M.S.F. in Jervis Bay and H.M.A.S. "BATHURST" was due to leave Melbourne next day.

At 0500K/29 an aircraft on patrol bombed a suspicious object in a position 072° 43 miles from Twofold Bay - about 105 miles south of Jervis Bay. An oil patch appeared after the attack and the aircraft reported sighting a periscope on a course of 100° speed four knots. S.O. 21st. M.S.F. was ordered to proceed from Jervis Bay and search the area with "BALLARAT", "QUIBERON" (duty destroyer from Sydney), "GOULBURN", "KALGOORLIE", "BURNIE" and "MARYBOROUGH" ("WHYALLA" had been ordered to Sydney with a leaking asdic dome). The weather at this time was bad with wind force 7, asdic conditions unfavourable and maximum operating speed 7 knots. At 0430K/30 a disappearing A.S.V. contact was reported by an aircraft in a position 32 miles south of Jervis Bay. "QUIBERON" was detached to investigate.

The surface search was abandoned late on the 30th. when all ships had reported negative results.

The sinking of "ROBERT J. WALKER", the first sinking by a submarine off the Australian coast since 16th. June, 1943, dispelled any lingering doubts as to the authenticity of the report of the attack on the Greek ship "ILISSOS" off the South Australian coast on 9th. December. While it is almost certain that the two attacks were made by the same submarine, it is difficult to understand why the U-Boat spent such a long period in excellent hunting grounds without making further attacks.

## 2. U-BOAT ATTACKS GREEK MERCHANT SHIP OFF SOUTH AUSTRALIAN COAST.

At 1210K on 9th. December, the Greek merchant ship "ILISSOS" on passage from Fremantle to Sydney reported that she



was being attacked by an unknown submarine in a position 37° 11' S, 139° 15' E (off Cape Jaffa). At 1315K she reported that the U-Boat had submerged after "ILISSOS" had fired back. H.M.A. Ships "BURNIE", "MARYBOROUGH" and "LISMORE" which were on passage from Fremantle to Melbourne were off Cape Nelson approximately 100 miles to the south-east of "ILISSOS" at the time of the attack and were ordered by C.S.W.P.S.F. to turn back to the assistance of the merchant ship. Owing to the severe weather the A.M.S's were only able to make good 7 knots and, after contacting "ILISSOS" at 1930K, "BURNIE" and "MARYBOROUGH" proceeded to the area of the attack and carried out a search until noon on the 10th. when they were ordered to proceed to Melbourne. "LISMORE" had developed engine trouble before reaching the attack area and had proceeded to Melbourne independently.

Air search and escort was instituted by R.A.A.F. Headquarters on receipt of the SSSS from "ILISSOS" and one Anson commenced a search of the area at 1400K/9. Three Beauforts escorted the ship from 1500K until dark. Searches were also carried out by Ansons and A.S.V. fitted Beauforts until late on the 10th. and by Ansons during the next morning.

"ILISSOS" was ordered to enter Port Phillip to establish the bona fides of her signals and N.O.I.C. Port Melbourne boarded the ship at 1900K/10. The master of the ship stated that the U-boat, which surfaced on the starboard quarter, had fired four rounds. He had heard the first shell at about 1145. Other members of the crew stated that this shell had fallen short on the starboard side. By the time the Master reached the bridge a second shell had passed over the ship and he saw it enter the water on the port side. The submarine submerged after firing four rounds from about 2500 yards and "ILISSOS" fired back four rounds two of which were close.

From the reports of members of the crew, including D.E.M.S. gunnery ratings, the presence of a submarine was definitely established but conflicting reports as to detail made it impossible to judge whether it was German or Japanese.

C.S.W.P.S.F.'s appreciation was that the submarine was possibly engaged on a minelaying mission and "BURNIE", "MARYBOROUGH" and "LISMORE", who were due to proceed to Sydney to commence working up with the 21st. Minesweeping Flotilla, were retained in Melbourne to sweep shipping routes in the shallow waters of Bass Strait. H.M.A. Ships "BALLARAT", "WHYALLA", "GOULBURN" and "KALGOORLIE", also of the 21st. M.S.F. were ordered to the area from Sydney. The following precautions were taken with



shipping proceeding close to the south-east coast:- Important shipping was diverted south of Tasmania; navigation lights were ordered to be extinguished west of 150° East except in the vicinity of Wilson's Promontory; ships were ordered to zigzag in the waters south of Australia and to stream paravanes when inside the 200 fathoms line between Newcastle and Fremantle. Minesweeping operations were continued until 21st. December, but no mines were located.

3. LATEST ASSESSMENT OF LOSSES IN PHILIPPINES FLEET ACTION.

Since the publication of A.C.B. 0254/44(2) further assessments have been received of the losses sustained by both sides in the naval actions in the Philippines area during the period October 24th. to 26th. The details below have been extracted from O.N.I. Weekly for 22nd. November, 1944.

Japanese ships which were seen to sink totalled 18 or 19 - 2 battleships, 4 carriers, 6 heavy cruisers, two light cruisers and 4 or 5 destroyers. All of these ships have been tentatively identified. 1 battleship, 3 heavy cruisers, 2 light cruisers and seven destroyers are listed as "so severely damaged that they may have sunk before reaching port". In addition damaging hits were claimed on 6 battleships, 4 heavy cruisers, 1 light cruiser and 10 destroyers.

The Japanese ships sunk in the three phases of the action were:-

Southern Force

Battleships	"FUSO" "YAMASHIRO" )	Sunk in Surigao Strait 25th. October
Heavy Cruiser	"MOGAMI" )	Sunk in Surigao Strait 25th. October
Destroyers	"MICHISHIO" "SHIGURE" or "NOWAKE" "YAMAGUMO" "ASAGUMO" )	Sunk in Surigao Strait 25th. October



Central Force

Heavy Cruisers	"ATAGO" "MAYA" "SUZUYA" "CHIKUMA" "HURAGO"	} Sunk by submarine off Palawau 23rd. October Sunk east of Samar Island 25th. October Sunk in Sibuyan Sea 24th. October.
Light Cruiser	"NOSHIRO" class	Sunk in Sibuyan Sea 26th. October.

Northern Force

Fleet Carrier	"ZUIKAKU"	Sunk east of Luzon 25th. October.
Light Carriers	"CHITOSE" "CHIYODA" "ZUIHO"	} Sunk east of Luzon 25th. October
Light Cruiser	"NAGARA" class	Sunk by submarine off Luzon 25th. October.

The American losses were the light carrier "PRINCETON" which was sunk by shore based planes off eastern Luzon on 24th. October, the escort carriers "GAMBIER BAY" and "SAINT LO" sunk by gunfire and air attack respectively east of Samar Island on 25th. October and the destroyers "JOHNSTON" and "HOEL" and destroyer escort "SAMUEL B. ROBERTS" which went in so gallantly against the Central Japanese force on 25th. October in an endeavour to stave off the attack on the escort carriers. The submarine "DARTER" ran on a reef and had to be destroyed after the sinking of "ATAGO" and "MAYA" on the 23rd. All of her crew were safely removed by another American submarine.

4. U-BOAT OPERATIONS IN THE SOUTH-WEST PACIFIC DECEMBER 1944.

After a lapse of nearly eighteen months, two attacks developed on merchant ships off the Australian coast during December. The attack on the Greek merchant ship "ILISSOS" off Cape Jaffa on 9th. December followed the sighting of a possible periscope by the American tanker "VICKSBURG" about 200 miles south of Kangaroo Island four days before. The movements of the submarine between the attack on "ILISSOS" and



the sinking of the American Liberty ship "ROBERT J. WALKER" are doubtful, but it is just possible that the sighting of A.M.S. vessels either immediately after the first attack or during their subsequent minesweeping operations in Bass Strait may have encouraged the submarine to pursue a policy of ultra caution by proceeding well to the south of Tasmania. Why the submarine did not complete the attack on "ILISSOS" after revealing her presence is also a mystery.

As mentioned earlier in this section, an aircraft carried out an attack on a possible periscope on 29th. December after the sinking of "ROBERT J. WALKER" and produced an oil patch, but no other evidence of damage. Two disappearing radar contacts were obtained by aircraft in the next four days - one 32 miles south of Jervis Bay on the 30th. and the other 30 miles S.S.E. of Newcastle on 2nd. January. No contacts were obtained by the surface ships sent to investigate.

There has been further evidence of the presence of German submarines in areas fairly near the coast of North West Australia. As mentioned in the last Review a German U-Boat was sunk by an Allied submarine in Lombok Strait on 10th. November. It is now known that another German U-Boat was sunk on 6th. October in the same area by the Netherlands submarine "ZWAARDVISCH" which picked up 27 survivors some of whom escaped the sunken U-Boat without the aid of escape apparatus. On 10th. December yet another German U-Boat was sunk in this area - this time by the U.S. submarine "FLOUNDER" about 40 miles from Bali. These losses, following the torpedoing of a German U-Boat off Penang by the British submarine H.M.S. "TRENCHANT" on 28th. September, must be having a strangling effect on blockade running operations between Germany and Japan. Later in the month, on the 17th., a D/F fix was obtained from a German U-Boat approximately 150 miles south of Cocos Island and, two days later, a merchant ship reported sighting a probable periscope about 600 miles south west of the island.

N.O.I.C. New Guinea issued an A.F. Message on 25th. December after three sightings of periscopes had been reported within two days near the coast of Central New Guinea. The merchant ships "EDWIN T. MEREDITH" and "WILLIAM A. HENRY" reported sighting a conning tower and periscope respectively within a half an hour of each other during the forenoon of the 24th. in the vicinity of 4° S, 145° 30' E, and "WILLIAM A. HENRY" reported another sighting on Christmas Day about 250 miles up the coast to the westward.



Several sightings were made in the western end of the Solomons Sea during the first half of the month. After a native report (graded C.3) of a submarine off Finschaven on the 2nd., two sightings were reported by merchant ships on the 5th. - one about 60 miles to the eastward of Finschaven and the other about 150 miles further east. Aircraft and A/S vessels commenced searches in the vicinity of the first of these reports and, after H.M.A.S. "TOWNSVILLE" had reported sighting a periscope during the morning of the 6th., further searches were carried out by "TOWNSVILLE", "KAPUNDA" and P.C. 1131 without success. On the 15th. the merchant ship "STEVEN GIRARD" reported that she was firing on a submarine 70 miles south of Gasmata. C.T.G. 71.9 stated that this submarine was not friendly.

Numerous sightings were made in the Philippines area and at least four attacks developed on possible contacts. So far there has been no evidence of any U-Boat having been sunk in this area during the month.

About half a dozen possible sightings were made between Wewak and the Celebes but the only attack made was by P.C.584 off Wakde on the 2nd. Three attacks were made before contact was lost but no results were observed.



SECTION IIOPERATIONAL AND TRAINING1. ALLIED SUBMARINES ALLOCATED FOR A/S TRAINING OFF SYDNEY

Up to the present officers and ratings passing through H.M.A.S. "RUSHCUTTER" and A/S teams from ships working up in Sydney have had very little opportunity for exercising with submarines. H.M.A.S. "KYBRA" has taken A/S instructional classes to Brisbane whenever possible and has carried out comprehensive exercises with U.S. submarines about to return to operational areas but very few other ships have been able to carry out these most important exercises around the Australian coast except those detailed to escort U.S. submarines from Brisbane to northern areas and those based at Fremantle.

From the middle of January, C.T.G. 71.9 has arranged that U.S. submarines will be made available in rotation for the purposes of A/S training. One submarine will be present at a time and the present intention is for each to remain for about two or three weeks.

To meet A/S training requirements for the British Pacific Fleet the Admiralty have allocated two U-class submarines from the East Indies Station. They will be based originally in Sydney but may be transferred later to other bases according to operational requirements.

2. ALLOCATION OF AUSTRALIAN ESCORT VESSELS IN FORWARD AREAS

C.S.W.P.S.F. has made the frigates "GASCOYNE", "BARCOO", "BURDEKIN" and "HAWKESBURY" available to Commander Philippines Sea Frontiers (Comphilseafrons) for escort duties in the Philippines area. "GASCOYNE" will join on completion of her surveying operations in the Philippines. "BURDEKIN" arrived early in January and "BARCOO" and "HAWKESBURY" are due to arrive during the second half of the month.

Early in January the Australian A.M.S. vessels in the New Guinea area were organised into the following escort groups:-

Group 1 H.M.A. Ships "LITHGOW", "GLADSTONE" and "LATROBE".



- Group 2 H.M.A.Ships "STRAHAN", "DELORAIN" and "GYMPIE"
- Group 3 H.M.A.Ships "STAWELL", "COOTAMUNDRA" and "ARARAT".
- Group 4 H.M.A.Ships "BUNDABERG", "KATOOMBA" and "COLAC".

These ships will be engaged predominantly in convoy escort work between Biak and Morotai.

3. P.P.I. RADAR

The accompanying photographs of P.P.I. "pictures" of Milne Bay and the northern entrance of China Strait illustrate some of the points mentioned in Section II, Article 2 of the Monthly Naval Warfare Review for December, 1944.

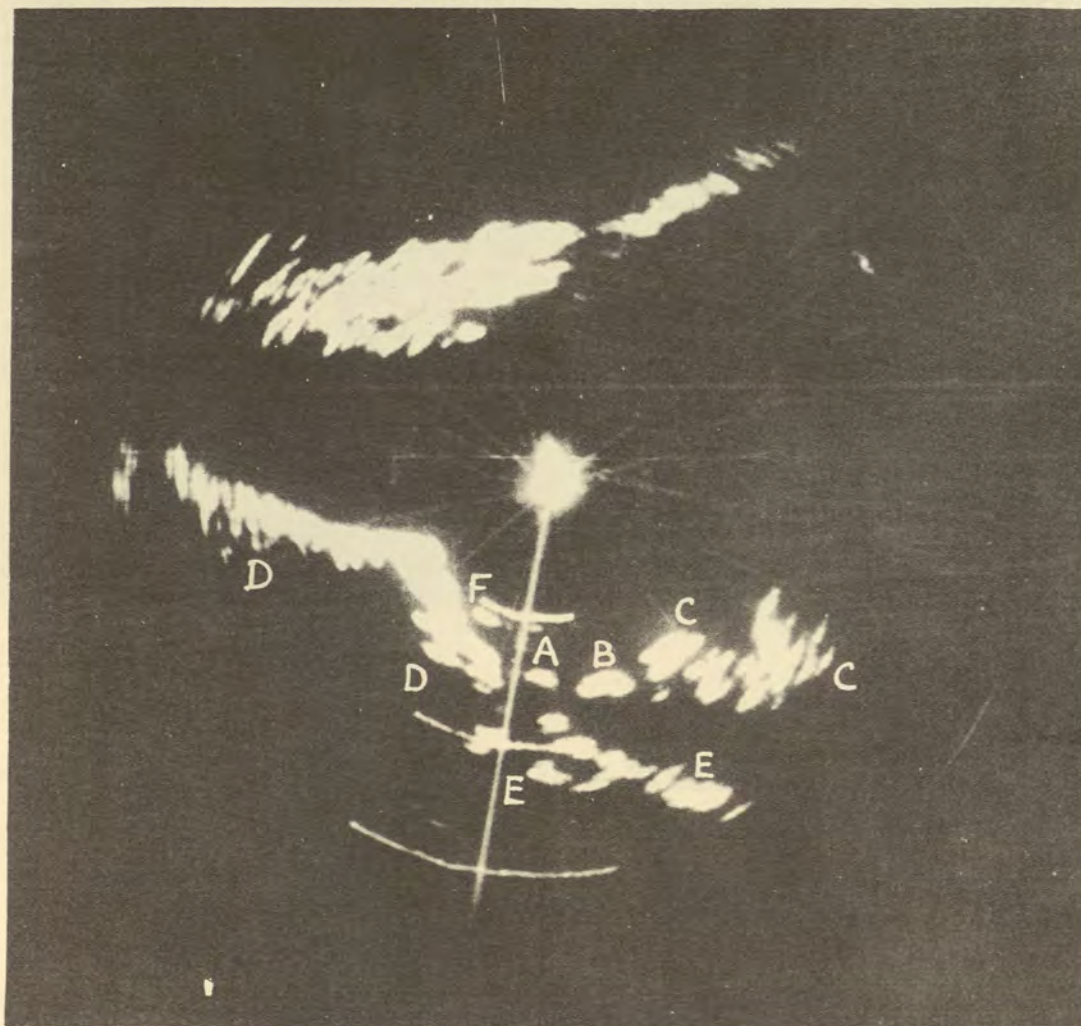


Figure 1

Northern entrance to China Strait

Figure 1 - Northern entrance to China Strait

Position of Ship -  $7\frac{1}{2}$  miles  $010^{\circ}$  from W.IGUARI island

Height of aerial above WL - 42 feet

Range scale in use - 30,000 yards

"Course marker" in use (Line from "Clutter" into China Strait)

"Range marker" (10,000 yards apart) switched on (These are the arcs intersecting course marker)

Note: The "ribbed" effect in the echoes is due to "chatter" in the driving motor of the scan.

The following points can be observed in Figure 1:

- (a) E. & W. IGUARI (A) appear as a single echo due to "beam width".
- (b) Ito Island (B) appears much bigger in comparison due to distortion.
- (c) Sideia Island (C) appears only as a bright echo with several faint echoes behind. This disjointed effect is due to "radar shadow". (i.e. high land closer to the set obscuring land behind and below it.) This effect is noticeable on the mainland at D and Sariba Island (E).
- (d) Observe how a comparatively small object (a ship at F) stands out.





Figure 2

Same "picture" as in Figure 1

Position of ship as in Figure 1  
Range Scale: 15,000 yards  
"Course" and range markers in use

Figure 2 gives a better idea of distortion due to technical considerations ("beam width" etc.). Observe the misshapen appearance of the N.W. corner of Sideia island A. In spite of this the picture is a good overall one for recognition of separate echoes.

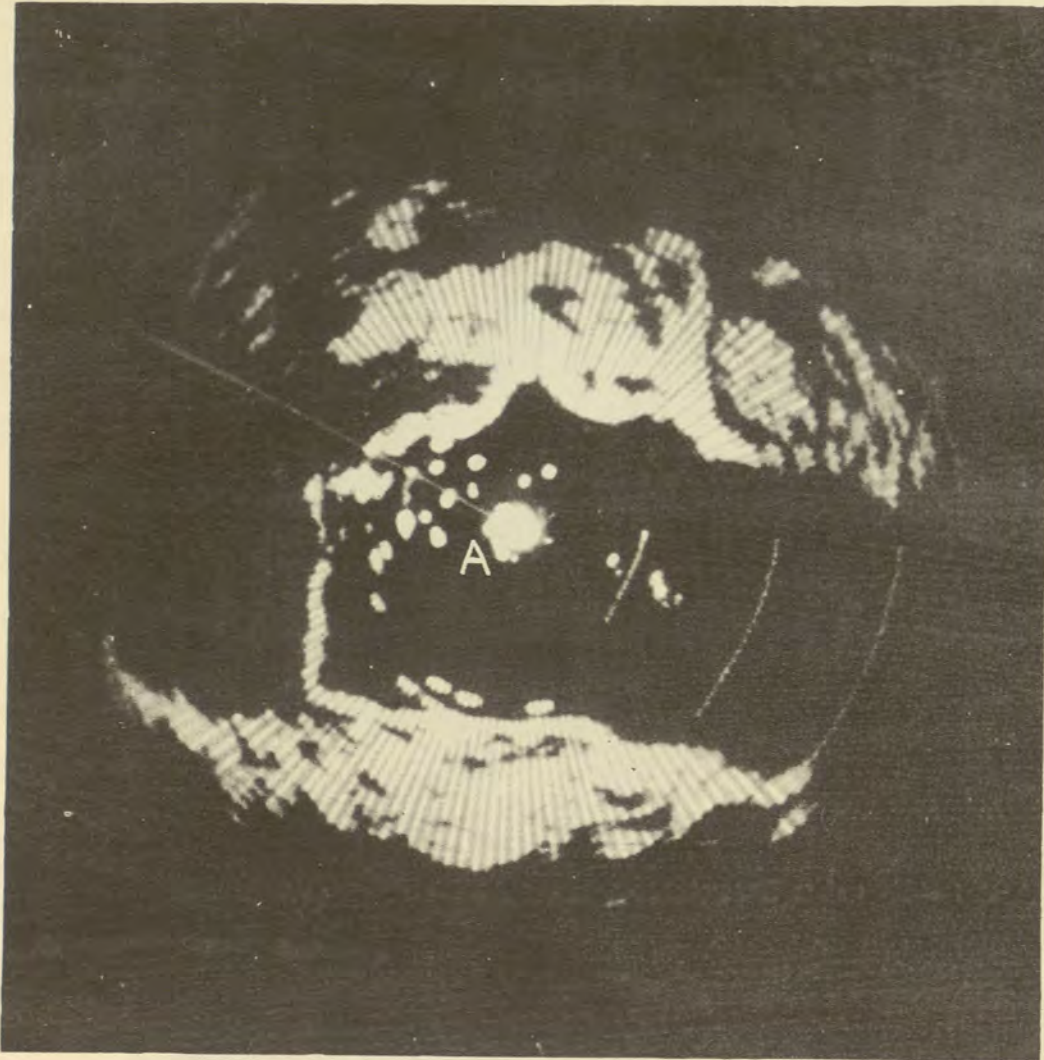


Figure 3.

Milne Bay, Western End.

Position of ship - Approximately 2 miles 085° from Hiwoli Island.

Range Scale - 15,000 yards

Figure 3 is a good example of how readily ships can be distinguished from other echoes provided the P.P.I. is compared with the chart. In this photograph, the Aliford Islands are difficult to distinguish but in actual practice moving echoes and ship echoes due to their appearance can be distinguished from fixed land echoes with a little experience. Observe the radar shadows in this photograph and how ship echoes close to the set run together (A).



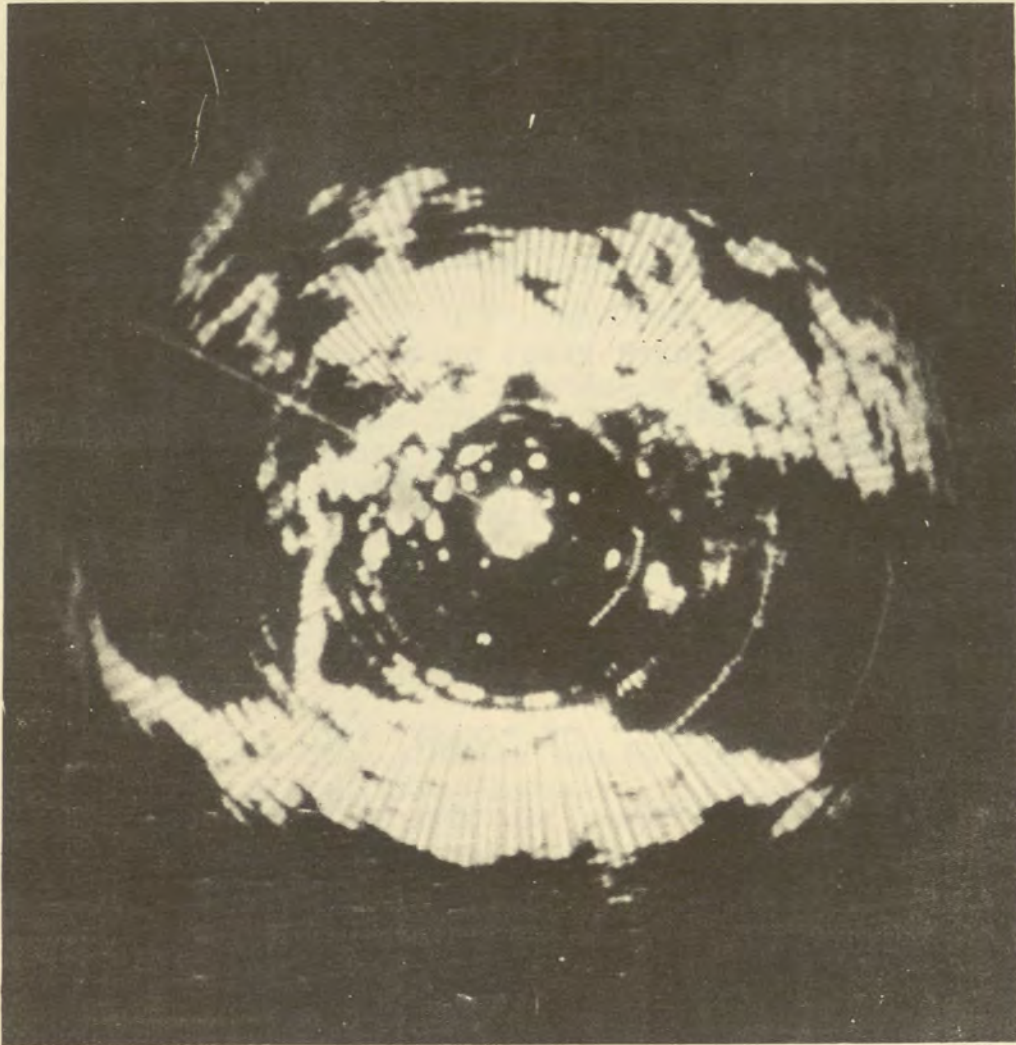


Figure 4

Figure 4 is of the same area as Figure 3 and illustrates how the P.P.I. screen becomes confused when the controls mentioned in the last paragraph of the article on P.P.I. Radar in the December Review are improperly adjusted.

SECTION IIINARRATIVES1. JAPANESE CARRIER OPERATIONS SINCE PEARL HARBOUR

The following article is summarized from the United States Pacific Fleet and Pacific Ocean Areas "Weekly Intelligence" for 17th November, 1944.

When the American Third Fleet units sank the Japanese Fleet carrier "ZUIKAKU" on the morning of 25th October east of Luzon, U.S. forces completed the destruction of all six of the Japanese carriers which attacked Pearl Harbour on 7th December, 1941. Enemy carrier losses since the war began now total seven fleet carriers, five light carriers and one escort carrier. The Japanese carrier strength has been reduced to 4 fleet carriers, 2 light carriers and 4 escort carriers.

The Japanese began the war with the following carrier organization (figures in brackets denote number of planes)

CarDiv 1	CV "KAGA" (84), CV "AKAGI" (60)
CarDiv 2	CV "SORYU" (64), CV "HIRYU" (64)
CarDiv 3	CVL "HOSHO" (19), CVL "ZUIHO" (28) and CVE "OTAKA" ("TAIYO") (28)
CarDiv 4	XCV "HITAKA", XCV "HAYATAKA" (planes not yet assigned) and CVL "RYUJO" (36)
CarDiv 5	CV "SHOKAKU" (64), CV "ZUIKAKU" (64) and CVL "SHOHO" (24).

The total strength of planes was 535 made up of 175 fighters, 156 dive bombers and 204 torpedo bombers.

The Pearl Harbour attack was conducted by CarDivs 1, 2 and 5 (less "SHOHO"). This force comprised all six of the enemy's fleet carriers carrying a total of 400 planes. "KAGA" was the flagship. After Pearl Harbour all ships returned to Kure with "SORYU" and "HIRYU" dusting off Wake Island on the way.



In early January, 1942, CarDivs 1 and 2 proceeded from the Empire to Palau, where they supported the Japanese occupation of the Dutch East Indies. On 18th February, these ships conducted a devastating attack upon Darwin. Another memorable operation of these ships was the attack upon Ceylon in early April. CarDivs 1 and 2 then returned to Japan to prepare for the Midway campaign.

Meanwhile, CarDiv 5 had left the Empire in January for Truk, from which it supported the occupation of the Bismarcks and the early landings in the Solomons and Eastern New Guinea. CarDiv 5 was covering a force bent on occupying Port Moresby when intercepted by U.S.S. "LEXINGTON" and "YORKTOWN" on 3rd May. The Battle of the Coral Sea was the result. "SHOHO" was sunk and "SHOKAKU" was badly damaged. CarDiv 5 took its two remaining ships to the Empire for repairs.

The enemy's next carrier operation was the Battle of Midway on 4th and 5th June, 1942. The carrier forces involved were small compared with recent fleet actions. Four Japanese carriers ("KAGA", "AKAGI", "SORYU" and "HIRYU") opposed three U.S. carriers ("ENTERPRISE", "YORKTOWN" and "HORNET") supported by shore-based aircraft. But the Battle of Midway was the turning point of the war. The enemy lost all of his 1st and 2nd CarDivs. After losing the carriers, the enemy's large fleet and occupation force turned back. ("ZUIHO" and "HOSHU" accompanied the enemy's occupation force at Midway but did not see action).

At the same time as the Battle of Midway, the enemy employed CarDiv 4 to attack Dutch Harbour. "HITAKA" and "HAYATAKA" had recently been converted from two unfinished passenger liners and "RYUJO" was a converted submarine tender. This first operation of CarDiv 4 was conducted to cover an enemy landing on Kiska Island.

The loss of five carriers at Coral Sea and Midway forced the enemy to re-organize his carrier fleet. Two CarDivs were formed as follows:-

CarDiv 1 "SHOKAKU" (72 planes), "ZUIKAKU" (72) and "ZUIHO" (36)

CarDiv 2 "HITAKA" (51), "HAYATAKA" (51) and "RYUJO" (30).

The 312 planes were made up as follows:- 150 fighters, 90 dive bombers and 72 torpedo bombers, a marked increase in the proportion of fighters and a preponderance of dive bombers over torpedo bombers.

The enemy's carriers were next employed to support his attempts to recapture Guadalcanal. Two important carrier actions resulted. The first was the Battle of Stewart Islands on 24th August, 1942. The Japanese had on hand "ZUIKAKU", "ZUIHO", "HAYATAKA" and "RYUJO". These four carriers were opposed by U.S.S. "ENTERPRISE" and "SARATOGA". The enemy was impressed from study of the



Battle of the Coral Sea by the fact that the American planes were so occupied with attacking "SHOHO" that they failed to attack "SHOKAKU" and "ZUIKAKU" and that the Japanese planes had been so preoccupied with attacking one of the American tankers under the delusion that it was a carrier that they failed to attack "LEXINGTON" and "YORKTOWN". From this the Japanese developed the idea of employing a decoy, or diversion, force in carrier and fleet actions. The enemy tried this tactical idea for the first time in combat during the Battle of Stewart Islands. "RYUJO" was sent forward with her screen as bait and was sunk by the American planes. Meanwhile, planes of the enemy's main force ("ZUIKAKU", "HAYATAKA" and "ZUIHO") attacked our carriers.

The second carrier action in the Guadalcanal campaign was the Battle of Santa Cruz on 25th October, 1942. The enemy again adopted the decoy or diversion tactics, employing "HAYATAKA" and her screen as an advance force to attack the American planes while CarDiv 1 struck at the American carriers, "SARATOGA", "ENTERPRISE" and "HORNET". "SHOKAKU" and "ZUIHO" were damaged and the major portion of the enemy's planes were lost but the Americans lost "HORNET".

Thus ended carrier actions until the First Battle of the Philippines Sea in June, 1944. An important result of these early actions was the enemy's loss of pilots and planes. A very high percentage of the enemy's best air personnel was lost in these early actions and has never been effectively replaced.

Throughout 1943 the Japanese carriers conducted no combat operations. The ships were engaged in training and ferrying or were held in a standby status at Truk. On several occasions the carriers were laid up for repair or damage inflicted by American submarines. The air groups for the most part were maintained at Truk. When, on several occasions, a large concentration of aircraft was required for a particular objective, the carrier air groups were shore-based.

The first major employment of the carrier air groups from shore bases took place in April 1943 during the Japanese landing at Hansa Bay. In order to draw attention away from Hansa Bay and prevent a second Bismarck Sea disaster, the enemy conducted four major attacks against Guadalcanal-Tulagi, Oro Bay, Port Moresby and Milne Bay on 7th, 11th, 12th and 14th April respectively. 216 carrier planes were brought down from Truk to swell the ranks of shore-based air groups and make possible a maximum effort.

Immediately following the first Allied landings on New Georgia on 30th June, CarDiv 2 Air Groups were advanced from Truk to the Solomons. These groups continued to operate in the Solomons until September when the remnants were absorbed by shore-based units. Meanwhile CarDiv 1 in July moved from the Empire to Truk where it was held in a standby status.



The next major employment of carrier groups from shore bases was in early November to counter the Bougainville campaign which had begun on 1st November. This time CarDiv 1 was employed while CarDiv 2 (to which "RYUHO" had been added) was training at Singapore after having been hastily reformed in the Empire. On 5th November the American carrier attack on Rabaul seriously damaged almost the entire cruiser fleet of the enemy. American carriers struck at Rabaul again on 11th November and most of CarDiv 1's planes were lost in a futile attack on the American task force off Bougainville. What was left of CarDiv Air Groups returned to Truk. For a short time following the landing on Tarawa on 15th November these planes were based in the Marshalls. By December what was left of CarDiv 1 had returned to the Empire to reform.

The reformed CarDiv 2 then advanced from Singapore to Truk to replace CarDiv 1. When, in January and February 1944, large-scale air attacks on Rabaul were commenced, the enemy sent CarDiv 2 Air Groups to the Bismarcks in a final effort to maintain air supremacy there. The effort failed and once again CarDiv 2 Air Groups were destroyed.

The enemy, following his defeats at Bougainville and Tarawa in December 1943, began to restore his fleet for an all-out decisive action. Three carrier divisions were organized, all with newly formed air groups.

CarDiv 1 "TAIHO" (75 planes), "SHOKAKU" (75) and "ZUIKAKU" (75)

CarDiv 2 "HITAKA" (51), "HAYATAKA" (51) and "RTUHO" (33).

CarDiv 3 "CHITOSE" (30), "CHIYODA" (30) and "ZUIHO" (30).

"TAIHO" was a brand new carrier built from the keel up. "CHITOSE" and "CHIYODA" had been converted in 1943 from aircraft tenders. "RYUHO" was another submarine tender converted to a carrier in 1942. The enemy also had a CarDiv 4, consisting of two battleships with flight decks aft ("ISE" and "HYUGA") each carrying 24 planes. The total plane-carrying capacity of this fleet was 498 of which 255 were fighters.

The enemy fought the First Battle of the Philippines Sea on 19th and 20th June with CarDivs 1, 2 and 3. It is probable that CarDiv 4 did not participate. It is believed that the enemy may have employed CarDiv 3 as a decoy while CarDivs 1 and 2 hit the American carriers from the flank. If this ruse was employed, it failed because CarDiv 3 was not sighted. In this First Battle of the Philippines Sea the enemy cleverly increased the attack radius of his carrier force by using shore bases, Guam and Yap, to refuel and rearm his aircraft. The enemy failed because of the defensive strength of the American Fleet in repelling the attacks and shooting



down practically all of the 450 Japanese planes. It is now estimated that American planes and submarines sank "SHOKAKU", "TAIHO" and "HITAKA" during this engagement.

A period of replacement and training followed. Then came the Second Battle of the Philippines Sea on 25th October. The enemy showed up with "ZUIKAKU", CarDiv 3 ("CHITOSE", "CHIYODA" and "ZUIHO") and CarDiv 4 ("ISE" and "HYUGA"). It is estimated that "ZUIKAKU" and all of CarDiv 4 were sunk.

Today the enemy has left "HAYATAKA" and "RYUHO" of the old CarDiv 2, CarDiv 4 and three new carriers built from the keels which had been laid for "YAMATO" class battleships - "UNRYU", "KATSURAGI" and "AMAGI". What combat use the enemy may make of his carriers in the future is anyone's guess. For the present, they will probably be used as plane ferries and high speed transports.

A brief word should be said about "HOSHO" and the enemy's escort carriers. "HOSHO" participated in several early operations but since Midway has been used exclusively for training. The enemy has converted five transports into escort carriers - "OTAKA", "UNYO", "CHUYO", "KAIYO" and "JINYO". All have been used extensively as plane ferries and to escort important convoys. "CHUYO" was sunk by an American submarine in December 1943, but the other four are still operational.

## 2. H.M.A.S. "NORMAN" BOMBARDS CAR NICOBAR ISLAND

In her Report of Proceedings for the month of October, 1944 H.M.A.S. "NORMAN" gives details of the part she played in the bombardment of Car Nicobar Island by the Eastern Fleet on 17th and 18th October. H.M.A.S. "QUIBERON" was the only other Australian ship present.

"AT 0645 F.G. on 15th October "NORMAN" proceeded to sea from Trincomalee with Force 63 for offensive operations in the Nicobar Island area. Force 63 was commanded by Vice Admiral Sir John Power in H.M.S. "RENOWN". Other ships in Force 63 were H.M. Ships "INDOMITABLE" (Flag of Rear Admiral Aircraft Carriers Eastern Fleet), "VICTORIOUS", "LONDON" (Flag of C.S.5), "CUMBERLAND", "SUFFOLK", "PHOEBE", "RELENTLESS" (Commodore (D)), "RAIDER", "QUILLIAM" (Captain (D) 4), "QUEENBOROUGH", "WHELP", "WESSEX", "WAGER" and "WAKEFUL", H.M.A.S. "QUIBERON" and H.N.M.S. "VAN GALEN".

"By 0830 F.G. on the 15th the Fleet was formed and course was set to the eastward at a speed of 18 knots. During the fore-



noon of 16th October, "PHOEBE" and the destroyers fuelled from "RENOWN" and the heavy cruisers. At 0600 on 17th October an air striking force was flown off to attack Car Nicobar Island. Surface ship bombardment was scheduled to commence at 0800 F.G. At 0800 F.G. "NORMAN" was in her initial firing position and direct fire was opened at shore targets. At 0958 the ammunition allowance (300 rounds) was expended and "NORMAN" in company with the 5th Cruiser Squadron proceeded to rendezvous with "RENOWN" to the north-westward of the island. The Fleet then retired to the westward.

"At 1800, "LONDON", "NORMAN" and "VAN GALEN" were detached to return to Car Nicobar to carry out a night bombardment as a feint to cover the operation of the main body to the southward. At 0128 F.G. on 18th October "LONDON", "NORMAN" and "VAN GALEN" opened fire on the north western coastal areas of Car Nicobar. Starshell was used freely but no return fire was met. At 0217 bombardment was completed and the three ships retired to the westward. "LONDON", "NORMAN" and "VAN GALEN" did not rejoin the Fleet but returned to Trincomalee arriving at 1712 F.G. 19th October."

### 3. PEARL HARBOUR - THE PLANNING STAGE

The United States Pacific Fleet and Pacific Ocean Areas Weekly Intelligence for 8th December, 1944 published the following version of the operational orders for the Japanese attack on Pearl Harbour in December 1941. These orders were reproduced entirely from memory by a Japanese Chief Yeoman of Signals who was captured on Saipan. The prisoner was attached to the Staff of C. in C. Combined Fleet (Admiral Yamamoto) in mid-1941 and had access to highly confidential documents while plans for Pearl Harbour were being perfected. His memory of detail is amazing and all testimony capable of confirmation from other sources has checked closely.

Flagship NAGATO, SAEKI WAN  
1st November, 1941

#### COMBINED FLEET SECRET OPORD NO. 1

The Japanese Empire will declare war on the United States, Great Britain and the Netherlands.

War will be declared on X-Day.

This order will become effective on Y-Day.

#### General Situation

(a) Policy toward the United States.



In spite of the fact that the Empire has always maintained a friendly attitude toward the United States, the United States has interfered in all the measures which we have taken in self protection for the preservation of our interests in East Asia. Recently, she has blocked our speedy settlement of the China Incident by aiding the government of Chiang Kaishek and has even resorted to the final outrage of breaking off economic relations. While senselessly prolonging Japanese-American negotiations, she has continued to strengthen her military preparations. She offers a threat to us in the form of a concentration of her Fleet in the Pacific Ocean thus attempting to exert on us both economic and military pressure.

(b) Policy toward Great Britain

Britain is aiding the government of Chiang Kai-shek and, acting in concert with her Allies and the United States, in interfering with our programme of construction in East Asia. Recently she has been steadily building up the defences of her bases in East Asia in an attempt to threaten us.

(c) Policy toward the Netherlands Indies

Although economic negotiations of a peaceful nature have been underway with us for a number of months, the Netherlands Indies has been led by Britain and the United States to reject flatly the continuance of mutually beneficial economic relations. Recently she has threatened the fortunes of Japanese which have been built up as a result of persevering work through long years.

(d) The ports and the vast fertile regions of the coast of China have been occupied by us and most of her great cities captured. China, however, supported by Britain and the United States, has not yet awakened from the deluding dream of "Fight the War and Save the Country" and is attempting total resistance to Japan in the form of a "scorched earth" policy for all China.

While organized resistance is gradually becoming weaker, the prevalence of guerilla warfare has obliged us to commit large numbers of troops to permanent garrison duty there. If we are to secure decisive victory, Britain and the United States, the powers behind China, must be destroyed.

(e) Policy toward the Soviet Union.

The strength of Soviet forces on the Soviet-Manchukuoan border is formidable.

The U.S.S.R. is maintaining a vigilant alert, awaiting developments. However, if the Empire does not attack the Soviet



Union, it is believed that the Soviet Union will not commence hostilities.

### Our Situation

The Fourth Fleet has largely completed preparation in the Mandated Islands, as has the Eleventh Air Fleet (Naval shore-based air) at essential bases in China, French Indo-China and Thailand. The state of repair of our ships and planes is generally excellent and the efficiency of their personnel has markedly improved.

### Strategic Objectives

To drive Britain and America from Greater East Asia, and to hasten the settlement of the China Incident. In addition, it is expected that when Britain and America have been driven from the Netherlands Indies and the Philippines, an independent self-supporting economic entity may be firmly established. The vast and far-reaching fundamental principle, the spiritual guide of our nation, (the "Eight Corners of the World Under One Roof - HAKKO ICHIU), may be demonstrated to the world. To this end we will use all the military strength necessary.

### Strategy

The strategy to be adopted against Britain, the United States and the Netherlands will be as directed in the Annexed Volume. X-Day and Y-Day will be announced later.

If before Y-Day the enemy is believed to have been able to ascertain our plans, the execution of X-Day will be made the subject of a special order.

If before X-Day we should be attacked by the enemy, his attack will be crushed with all available strength. All commanding officers will act in conformance with "Strategy to be Adopted in the Case of an Enemy Attack".

In the case of the Soviet Union, every effort will be made to avoid provoking hostilities. At the same time, every effort will be made to insure the secrecy of our plans. If the enemy should ascertain our plans, military operations will immediately be begun in accordance with "Measures to be Taken in the Case of an Attack by the Soviet Union."

Circulation of this order is limited to Fleet and Force Commanders. These Commanders will take every possible measure to prevent leakage of these plans prior to their being carried out.

Precaution: Disposal of this order.



This order must be burned when no longer of use. If there is any danger of its falling into enemy hands as the result of a ship sinking or some other untoward occurrence, the responsible Commander shall personally make immediate disposal of it.

Combined Fleet SECRET OpOrd No. 1

Annexed Volume

1. Joint Army-Navy operations will be carried out in accordance with the "Army-Navy Central Headquarters Agreement".

2. A Striking Force (Carrier Task Force), having the 1st Air Fleet (Carriers and Escorts) as its main element, will depart its naval bases or operating areas about X-16 Day, and will set course, by way of Takan Bay (Hitokappu Bay, Etorofu Island, Kuriles) for Pearl Harbour, the base of the American Pacific Fleet, where it will deliver a surprise attack.

X-Day is expected to be during the early or middle part of December.

3. Targets for attack are airfields; aircraft carriers; battleships, cruisers and other warships; merchant shipping; port facilities; and land installations, in that order.

4. From the time set by the Force Commander for the Striking Force to leave port in Japan, strict radio silence will be observed. Communications will be via ordinary broadcast system. The code book to be used will be "(not certain)". The following communications abbreviations will be in effect:

"Many warships in Pearl Harbour" - "The fate of the Empire"

"No warships in Pearl Harbour" - "The cherry-blossoms are in all their glory"

"The weather is clear and visibility good in the region. Suitable for an attack" - "Climb Mt. Fuji".

"The time to commence the attack is 0520". - "The depth of the moat of Honnoji Temple is 0520".

"All forces attack". - "Climb Mt. Niitaka!"

5. The course and the disposition of the attacking units will be determined by the Striking Force Commander.

The Commander of the Striking Force will inform the proper



authorities as soon as he determines on the course and disposition of the attacking units. Care must be taken to avoid ordinary merchant shipping routes and to keep the plans from disclosure under any circumstances whatever.

6. Procedure to be followed in case of discovery before the attack either by a ship of the nation against which war is to be declared, or by a ship of a neutral nation (including the Soviet Union).

(a) In case of discovery within 600 miles of the objective by a ship of a nation against which war is to be declared, make immediate preparation to attack and sink it.

(b) In case of discovery within 600 miles of the objective by a ship of a neutral nation, the ship should immediately be detained until it can do us no actual harm; strict surveillance should be kept of its radio transmission. In case it should make any transmissions which might prove harmful to us or give us reason to fear that our plans might be revealed, the ship will be seized by a destroyer which will make immediate attack preparations.

(c) In case of discovery by a foreign ship more than 600 miles from the objective, the ship will be detained and radio transmission forbidden. However, if it seems highly probable that our general intentions have been guessed, an attack should be made immediately, if between X-5 Day and X-Day. If before X-5 Day, the Striking Force Commander will decide the disposition of the ship, depending on the circumstances. In the case of detention of an enemy ship, "B" method will be followed.

7. The Commander of the Surprise Attack Force (Submarine Force having the 6th Fleet (Submarine Fleet) as its main element, will have most of the submarines leave the western part of the Inland Sea on X-20 Day to attack Pearl Harbour. Its entire strength will be disposed so as to command the harbour mouth. It will attack any enemy warship which may have escaped from the harbour. It will also carry out reconnaissance before the attack, and if the opportunity presents itself, will carry out surprise attacks on enemy warships with midget submarines. The time for such attacks will be after the flights of planes have attacked Oahu. Every possible means for recovery of midget submarines should be considered.

8. Joint Army-Navy operations should be carried out in accordance with the provisions of the Central Headquarters Agreement. The disposition of forces will be determined by the Commander of the Advance Force (principally Second Fleet cruisers and destroyers). The Commander of the Advance Force will inform the proper authorities as soon as he decides on the course and disposition of the attacking units.



The point of departure for the ships of the Malay and French Indo-China Forces will be Bako and the point of departure for the Philippines occupation Force will probably be Palau.

9. The capture of English and American troops and ships in China will be arranged by the Commander-in-Chief of the China Area Fleet. The occupation of Hong Kong will conform to the provisions of the Army-Navy Central Headquarters Agreement and is the responsibility of the Commander, 2nd China Expeditionary Fleet.

10. English and American merchant ships which are in ports under Japanese sovereignty at the time of the outbreak of the war or which are in ports which may be taken are to be captured if possible.

Soviet shipping is to be kept under surveillance after undergoing a rigid inspection.

It should be so planned that none of our shipping will be in foreign ports when the war breaks out.

11. Beginning on Y-Day the Commander of the 1st Combined Communication Unit will send false messages to give the impression that the main strength of the fleet is in the western part of the Inland Sea.

After Y-Day has been determined, the NYK passenger vessel "TATSUTA MARU", which is scheduled to proceed to the west coast of America, will sail; arrangements will be made to have her return while en route. (This was done, and Allied passengers were interned; the same procedure would have been followed with any trans-Pacific liner scheduled to sail in this period).

When Y-Day has been determined, the Commandant of the Yokosuka Naval District will allow as many men of his command as possible to go ashore so that the number of men on liberty in Tokyo and Yokohama will give a false impression. (Another P.O.W. confirms this).

12. The Commander-in-Chief of the 4th Fleet (Mandates Fleet) will expedite the attack and occupation of British, American and Dutch bases in North and South Pacific, acting in close co-operation with forces of the 11th Air Fleet in the South Pacific. Enemy air power within our sphere of operations will be checked and communication between Australia and the mainland of the United States will finally be cut.

It is expected that in this manner Australia will be isolated and dominated completely. The natural resources of all kinds which the vast continent of Australia boasts will then fall to us.



(The dates for execution of assault and occupation of various British, U.S., Netherlands bases were then listed in this paragraph - a few of which follow:)

(1) GUAM about X plus 2.

(2) WAKE about X plus 7.

(3) (The dates for the invasions of Rabaul and the islands from the Solomons to the Fijis, Samoa, and Santa Cruz groups were all entered).

13. The date for the seizure of Midway is set as late Spring 1942. The date for the occupation of the Hawaiian Islands is scheduled for October 1942.



SECTION IVINTELLIGENCE1. NEW JAPANESE ECHO-RANGING EQUIPMENT

A Japanese document, captured on Saipan describes the latest development in Japanese underwater echo-ranging equipment. This document, dated April 1944, was published by the Japanese Navy ASW School "Special Underwater Ranging Training Section". It describes in full the principles and operation of the Type 3, Models 1 to 4 echo-ranging equipment which is radically different from Asdic gear reportedly aboard Japanese combatant ships and escorts at present. The individual components are not new but their integration is.

For information on other types of Japanese underwater gear see A.C.B. 0233/44 (8) and (9).

Important Features of the Type 3

- (i) Frequencies - Model 1 and 2 - 13 kcs. (Used aboard destroyers and "KAIBOKANS")  
Model 3 and 4 - 16 kcs. (Used aboard transports and "transport submarines")
- (ii) Uses two magneto-striction projectors simultaneously
- (iii) Measures bearing by means of a phase meter.

The Type 3 echo-ranging gear measures the range of enemy ships by means of the conventional method, that is, time difference between transmitted and received signals. However, instead of rotating the projectors to determine the bearing of the target, the bearing is determined by measuring the time difference of the received signal phase-lag with a phase meter (Cathode Ray Tube), thus allowing the projectors to be fixed. Since it is necessary to measure the phase lag, two projectors, two amplifiers and a cathode ray tube have become necessary.

The two projectors are independently wound and are installed so that when transmitting they are connected in series and when receiving they are connected in parallel by means of a transmit-receive relay. This gives the advantage of limiting the beam of the outgoing signal but broadens the effective receiving pattern.



The projectors A and B are connected to a cathode ray tube through amplifiers with the output of A connected to the vertical plates and the output of B connected to the horizontal plates. A signal from right ahead impresses a voltage only on the vertical plates, making the trace move horizontally. A signal from Red or Green 90 impresses a voltage on the horizontal plates making the trace move vertically. If the signal comes from a relative bearing between 0 and 90 the trace will move to a position on the cathode ray tube which is the vector resultant of the two voltages from the projector-amplifiers. In this way, by calibrating the face of the cathode ray tube, the bearing may be read directly in degrees.

### Performance

- |  |   |   |
|--|---|---|
| (i) Echo-ranging capability  | Maximum search range                          | 2,000 meters<br>(2,200 yards)                           |
|  | Minimum search range                          | Japanese<br>"assume" to be<br>100 meters<br>(110 yards) |
| (ii) Search capability   | Red 35 to Green<br>35.                        |   |
| (iii) Listening capability<br>(if the target is a<br>submarine and the<br>listening ship is at<br>low speed) | "Assumed" to be 1,000 meters<br>(1,100 yards) |   |

## 2. "YAMATO" CLASS BATTLESHIP

The United States Pacific Fleet and Pacific Ocean Areas Weekly Intelligence Report for 1st December, 1944 published additional design and armament details of the "YAMATO" class of Japanese battleships which were revealed from analysis of Philippines battle photographs.

The first photograph of this new battleship was made on 4th February, 1944 during the earliest reconnaissance of Truk. Although the altitude from which the photograph was taken was too great to permit detailed examination of the ship, it is obvious that considerable change in the secondary armament was made during the subsequent eight months and that more and heavier AA protection was added. The following changes were noted:-



Removal of two triple turrets formerly located port and starboard athwartships of the funnel. These are thought to have been the same as the two remaining triple turrets of the secondary battery which are considered to be 6.1-inch guns.

Addition of twelve dual-purpose guns in twin mounts, believed to be 5-inch. These guns are on raised pedestal mounts, three on each side and utilizing the space formerly occupied by the two triple mounts.

The addition of ten single-mount shielded guns, believed to be either 4.7-inch or 5-inch. Four of these guns are in sponsons, two on each side amidships and six are grouped three on a side near the extremities of the new 5-inch mounts.

The probable removal of four structures of unknown function which were located on either side of the triple turrets.

Two unusual features of this battleship were a slender tracklike section (apparently flush with the deck) along a break in the quarterdeck and two rectangular round-topped structures located athwartships of the forward secondary turrets. It is possible that the former may lower at one end to form a ramp to be used in releasing the midget submarines reportedly carried by this class of ship. No explanation has yet been discovered for the latter and nothing similar has been observed previously.

Both units of the "YAMATO" class were photographed in the Philippines action and it is considered that the armament of the two is identical. The above changes in armament refer only to the ship originally photographed. The other unit may have been built originally with the present armament.

The size of the main battery of the "YAMATO" class is still an open question. Photographs prove only that the guns are at least 16-inch, and an additional width of at least 5½ feet in the turret and barbette over the American battleship "IOWA" indicates that the guns could be up to 17.7-inch as claimed by several prisoners of war.

The probable armament is as follows:-

9	16-inch (minimum) in triple turrets
6	6.1-inch in triple turrets
24	5-inch A/A (twin)
16	4.7-inch or 5-inch A/A
16	25 mm. A/A (quadruple)
6	A/A MG.

A photograph of the ship's wake has been interpreted to



indicate a turning circle of 2,000-2,200 feet. This same photograph taken while the ship was completing an evasive turn and under attack, indicates a possible speed as fast as 34 knots. A limiting factor in this interpretation is that the wave pattern was slightly disrupted by torpedo hits aft at the moment of the exposure. The turning diameter of the ship might also have been affected by this disruption. The hull lines of this class, with a long narrow bow, indicate a fast ship, but this high speed is not confirmed by captured documents or prisoner of war interrogations, which give 26 to 28 knots as "YAMATO'S" maximum speed.

One of the two "YAMATO" class battleships was believed heavily damaged in the Second Battle of the Philippines on 24th October when approaching San Bernardino Strait with the Central Japanese force. A prisoner of war has stated that "MUSASHI" was hit on this date. This battleship may have subsequently sunk; if not, a long layover in a port capable of major repairs was probably required.

### 3. JAPANESE SHIP RADAR

All Japanese cruisers and battleships are now equipped with the lightweight, portable Mark 1 Model 3 air search radar, according to a Jap. radar operator from the cruiser "SUZUYA", which was sunk by Third Fleet forces east of Samar on 25th October, 1944.

The prisoner of war, who studied radar at the Yokosuka Naval Signal School, told Third Fleet Interrogators that the Mark I, Model 3 set operated on a frequency of 170 megacycles. Previous information from captured documents indicated that a frequency of 150 megacycles was used for this model which was originally designed for shore based use. A badly damaged set of this type was found on Namur Island.

The prisoner of war, whose information on other types of radar checked closely with data already available, stated that the Mark I, Model 3 had been installed in "SUZUYA" in March, 1944. He claimed that all Japanese destroyers are now carrying this same type for air search, as well as the Mark 2 Model 2 for surface search and fire control.

The Jap. radar operator stated that "SUZUYA" was equipped with two other types of radar in addition to the Mark I, Model 3. One of these was the Mark 2 Model 1, which the prisoner operated for air search on a 210 megacycle frequency with a pulse rate of 2,000 per second and pulse width of 5 kilometers (33 microseconds). The maximum range of this radar was said to be 150 kilometers (about 80 nautical miles) with an "A" scope presentation only. However, the maximum



range at which the P.O.W. had detected planes was approximately 120 kilometers (about 65 nautical miles); low flying planes 50 kilometers (about 27 nautical miles) and ships 28 kilometers (about 15 nautical miles). (Comment: Figures given above appear fairly accurate except for the pulse rate of 2,000 per second, which is obviously much too high; intercepts have indicated a pulse rate of 500).

The other type of radar which the P.O.W. had seen in "SUZUYA" was the Mark 2 Model 2 for fire control and close surface search. It was stated that this type was supposed to be very accurate in computing range and bearing. He estimated the maximum range of the Mark 2 Model 2 to be 50 kilometers (about 27 nautical miles). A frequency of 2,800 megacycles was reported, with a pulse rate of about 2,500 per second. P.O.W. could not estimate the pulse duration but, according to previous information, it runs between 5 and 6 microseconds.

The P.O.W. further claimed that two air search radar sets were installed in all cruisers and battleships to provide the necessary amount of coverage. "SUZUYA", he said, had been equipped with radar for seven months and had operated during this period without a major breakdown.

At the Radar School the P.O.W. had been told that submarines were equipped with Mark 2 Model 2 for directing torpedo fire, although he had never seen these installations.

The captured operator had never heard of I.F.F. and knew no way to distinguish enemy from friendly planes by radar, although he said that the "Boeing" (presumably the new B-29) was recognizable since it recorded a larger pip than any other plane.

The prisoner said he had no definite information of tactical employment of the radar he operated, since this type of work was handled by the radar officer. However, he did express the opinion that the bearing accuracy of the Mark 2 Model 1 was poor and that it had a wide antenna pattern. It was unsuitable for anti-aircraft firing, but had allegedly been used with some success to vector planes to intercept Allied aircraft.

The antenna in "SUZUYA" for the Mark 2 Model 1 was of the bedspring type and was located on the forward mast. The rest of the equipment was housed in a special compartment. The radar was operated continuously and the operator worked a ten-hour watch. The Mark 2 Model 1 was the only type he had operated.

In addition to his duties as radar operator, the P.O.W. said that he spent two hours a day on a search receiver known as a "Tanchiki". This apparatus was set at 270 megacycles to pick up Allied submarines, and the prisoner claims to have heard them at that setting.



#### 4. GERMAN SUBMARINE DEVELOPMENTS

The German U-boat fleet is in a state of transition as a result of the loss of its best operating bases, its failure to interfere with the invasion of France and the development of new equipment and new types.

The Bay of Biscay bases afforded the Germans sheltered accommodations for more than 100 submarines. Since June, Germany has been gradually transferring her submarine fleet from these bases to Norwegian and German ports. Bergen and Trondheim have shelters for only about twenty units. Other submarines can seek concealment and dispersion in the numerous small bays and fjords with which the Norwegian coast abounds. Some of the units formerly based in French ports have probably returned to German ports for refitting. In any case Germany is now faced with the problem of operating from more remote and less sheltered bases. Submarines of 500 tons and 750 tons can no longer operate south of the equator without refuelling and the Caribbean area is near the maximum range of 500-ton vessels. The larger submarines, of which Germany possesses only a limited number, can still operate in all waters and, in blockade running, reach Japan without refuelling.

Germany appears virtually to have abandoned construction of her standard 500-ton and 750-ton submarines. Vessels of these types laid down in 1943 are, for the most part, being completed but their failure in 1944, both as anti-invasion weapons and as raiders of Allied commerce, has compelled Germany to develop new U-boats. Almost all new construction in German yards is of the 250-foot prefabricated (Type XXI) and the 110-foot prefabricated (Type XXIII) submarines. The construction of these prefabricated types is on a considerably greater scale than was at first supposed.

It is known that the building time (assembly) of the larger prefabricated submarines is 6 weeks from start to launching, as compared with 4 or 5 months by the former processes. It is known also that only three yards, located at Danzig, Hamburg and Bremen, are engaged in the actual assembly of the larger of these two new prefabricated types. Upwards of 10 yards, however, are engaged in the building of the sections. Only two yards are at present assembling the smaller 110-foot prefabricated submarines and most of the sections of this type are also built at these yards.

According to photographic reconnaissance, it appears that sections are being turned out in great quantities and that assembly yards are not able to handle with despatch the large accumulations of sections. This would seem to indicate the probability of additional yards in the near future becoming engaged in assembly work.



A considerable number of vessels appear to have been assigned to the transport of prefabricated sections between German ports. At least seven vessels of 300 feet or more are permanently engaged in this traffic and many other smaller vessels and barges seem to be similarly employed.

Considerable speculation exists as to the probable operational characteristics of these two types of prefabricated submarines, but they are reported to have greater submerged speed than the 500-ton and 750-ton types. A tentative summary of characteristics of these two types is given below:

	<u>Type XXI</u>	<u>Type XXIII</u>
Dimensions	224-250 feet x 19-20 feet	108 feet x 11 feet (max.)
Draft	16 feet (mean)	
Displacement	∅ 1000-1600 tons (1200 probable)	∅ 180 tons
Armament	∅ 2 twin 37 mm.	
Torpedoes	∅ 6 bow (6-8 bow, 2 stern reported) 21-inch carried	2 bow
Speed (Knots)	∅ 18-21 surface, 12-18 submerged	∅ 12 surface, 13 submerged
Propulsion	∅ GW or MAN Diesels (2400 HP each?); 2 motors (1300-2500 HP each?)	2 Diesels, 2 motors
Batteries	∅ Up to 4-90-cell units reported	68 cells
Equipment	Schnorkel	Schnorkel and Echolot
Prefabricated Parts	7	5

∅ Unverified figures

An entirely new type, probably still in the experimental stage, has been spotted in reconnaissance over Danzig. Three of these were 65 foot (semi-submersible?) craft and another was a 90 foot model.



5. RADAR IN JAPANESE DESTROYER "ASAGUMO"

Interrogation of the Captain of the Japanese destroyer, "ASAGUMO", which was sunk in the Philippine naval battle, gives some information on the tactical aspects of shipborne radar which is believed to be reliable. This officer had no technical radar knowledge.

(a) The following radars were carried on DD "ASAGUMO".

An air search radar with "mattress antenna" (Mk. II Model 1)

A surface search radar, "2-horn type". Also used for surface fire-control. (Mk. II Model 2, but may be "Modification 2" using 3 horns).

A radar intercept receiver (70-420 mc).

(b) The fire-control radar (Mk. II Model 2) was not very effective. Nothing corresponding to an A.I.C. was used and the P.O.W. had never heard of other ships using it. In the Leyte Gulf action, this radar found great difficulty in separating P.T. boat echoes from land echoes

(c) The Mk. II Model 1 radar had detected aircraft up to 75 km (about 41 miles) away.

(d) The radar intercept receiver on the "ASAGUMO" was inoperative but was intended to give warning of enemy ships in the vicinity. A log of intercepted signals was not submitted, but casual exchange of information with other ships might occur. The antenna was "squirish" and mounted at the back of the bridge. It could not be seen from outside the ship.

(e) The P.O.W. stated that the radar equipment was installed at Yokosuka and that other ships had been fitted at Kure. He also thought it probable that most Japanese bases had radar installation facilities.

(f) He confirmed the belief that only the simplest radar maintenance could be carried out on board ship. Among the ships complement there were three radar operators but no radar officer or technician. A continuous watch was kept only if justified by circumstances.

(g) The P.O.W. stated definitely that all destroyers and larger warships were radar equipped. He did not know about small craft but thought that subchasers, submarines and P.T. boats would also be fitted.



6. SIDELIGHT ON SUICIDES

A Judy pilot interrogated by Third Fleet after being shot down in an attack off the Philippines provides a sidelight on the nature of the so-called "KAMIKAZE Special Assault Force" of suicide divers.

This pilot was a member of 502 Naval Air Group, which he said had been joined with several other groups for operations in the Philippines. His information is open to question, but he appeared reliable on matters which could be checked.

Quoting the interrogation report:-

"P.O.W. stated that his unit had become a "suicide" squadron on the 27th October. The designation as a suicide squad came as a result of the group's commanding officer's request for such designation having been granted by higher authority. The prisoner stated that pilots and other personnel of the group were not questioned as to their desire to become members of a suicide squad.

"He felt that the order to dive on carriers to one's self-destruction was absurd (Bakarashi), but since it was an order he fully intended to carry it out. He did feel that there had been a needless expenditure of life with very little visible success to date. The pilot claimed that he had been given no instruction on the best way to carry out suicidal attacks on carriers; however, he did feel that he would attempt to hit an elevator in that elevators on a carrier were "weak points". At the time he left Mabalacat (his base) there were still 50 members of the suicide squadron alive but very few flyable aircraft were available. (Subsequent strikes on Luzon by our carriers may have cut down this number).

"P.O.W. was of the opinion that his unit was the only dive-bomber squadron in the Japanese Navy that had been designated as a suicide squadron; however, he felt that in the event of carrier attacks being launched on Japan proper, suicidal attacks in large numbers should be anticipated. P.O.W. did not believe green and yellow silk flight clothing reported as having been recovered from the body of a Jap pilot who had made a suicide attack on a U.S. carrier had any special significance.

"P.O.W. stated that the lack of aviation gasoline had caused the Japs to cut down on the extent of training, but he had heard of no instances in which offensive missions could not be flown as a result of a lack of aviation gasoline."

P.O.W's belief that his unit was the only one designated as a whole for suicide work coincides with other available evidence.



From recent Japanese propaganda broadcasts, it appears that most of the so-called "KAMIKAZE" units are made up more or less extemporaneously of volunteers from various groups acting independently. The "KAMIKAZE" designation appears to be a special mark of distinction applied to any such volunteers, rather than the name of a formal organization.

If true, however, the designation of an entire air group as a suicide unit may mark a significant change in the development of this tactic.

(U.S. P.F. & P.O.A. Weekly Intelligence 8th December, 1944)



SECTION VMISCELLANEOUS1. METEOROLOGICAL INFLUENCES ON RADAR

Since the introduction of Radar into the Navy, many officers have been confronted with the problem of interpreting radar reports of objects at freak ranges.

With the surface warning set Type A.272, these ranges are generally far in excess of the ranges at which the various types of ships and low flying aircraft are normally observed. Sometimes echoes appearing on the Radar Screen are due to objects many miles beyond the limits of the range displayed, and thus investigation of the area in the vicinity of the reported range has drawn a blank.

Similarly, the combined warning set Type A.286 Q has, on occasions, failed to detect high flying aircraft until they were well within normal detection range; or has detected them initially at some abnormally long range, or after detection has lost them for unusual periods of time.

The Air Warning Set type 281 has, on occasions, produced wrong evaluations of aircraft height.

These abnormalities are due to anomalous propagation of Radar waves. This is caused mainly by sharp discontinuities in the humidity gradients over the areas affected. The effects are to distort the normal paths of the waves, with the results stated in Para. 1. The possibility of serious consequences arising from erroneous evaluation of Radar presentations need not be stressed.

Average performance range figures for all Radar sets are given in C.B. 4182A and A.C.B. 0235. The figures are obtained under conditions of "Standard Propagation" of the Radar Waves. Standard propagation means that a theoretical straight line path of a wave is gradually and continuously bent slightly downwards. The resultant increase in horizon distance over the geometric measurement is corrected before average range figures are published.

Freak ranges are obtained when a wave path is bent downwards or upwards at an angle greater than that occurring with standard propagation.



All bending is due to atmospheric pressure, moisture content and temperature. In areas where temperature and moisture content decrease gradually with height, meteorological conditions will lead to standard propagation.

In areas where discontinuities in temperature and moisture gradients occur, the conditions will lead to anomalous propagation.

Standard propagation occurs in conditions of low barometer, strong winds, and turbulence; i.e. conditions which will prevent layer formations in the atmosphere.

Anomalous propagation occurs in conditions of barometric high, little or no wind, clear skies, and where low level subsidence occurs, i.e. where pronounced moisture lapses, or possible temperature inversions, cause discontinuities in humidity and temperature gradients with consequent layer formation and change in refractive index.

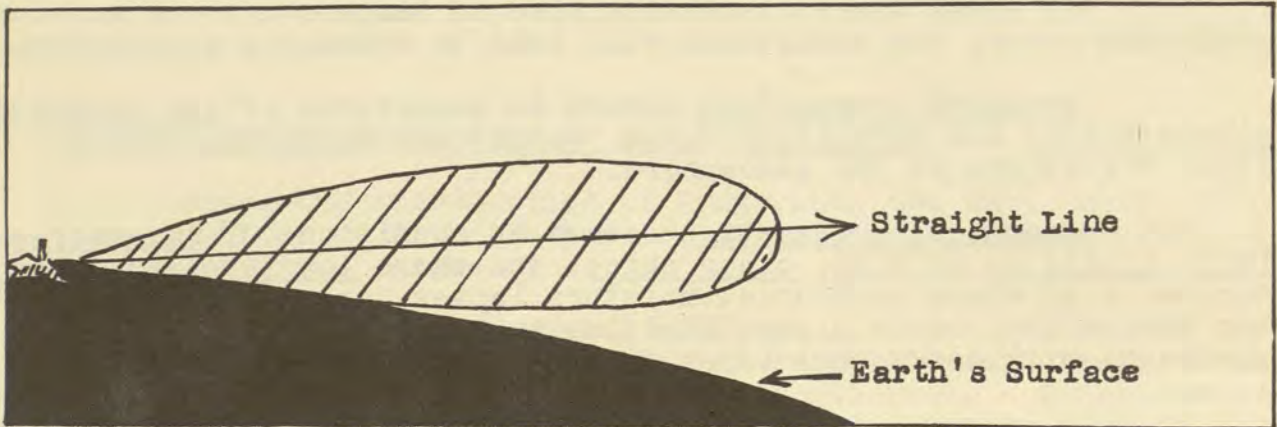
For example, westerly winds from the Australian continent flowing over the eastern coastline may cause temperature inversion and evaporation into the lowest levels.

Also, inshore, nocturnal cooling of the land may give rise to layer formation.

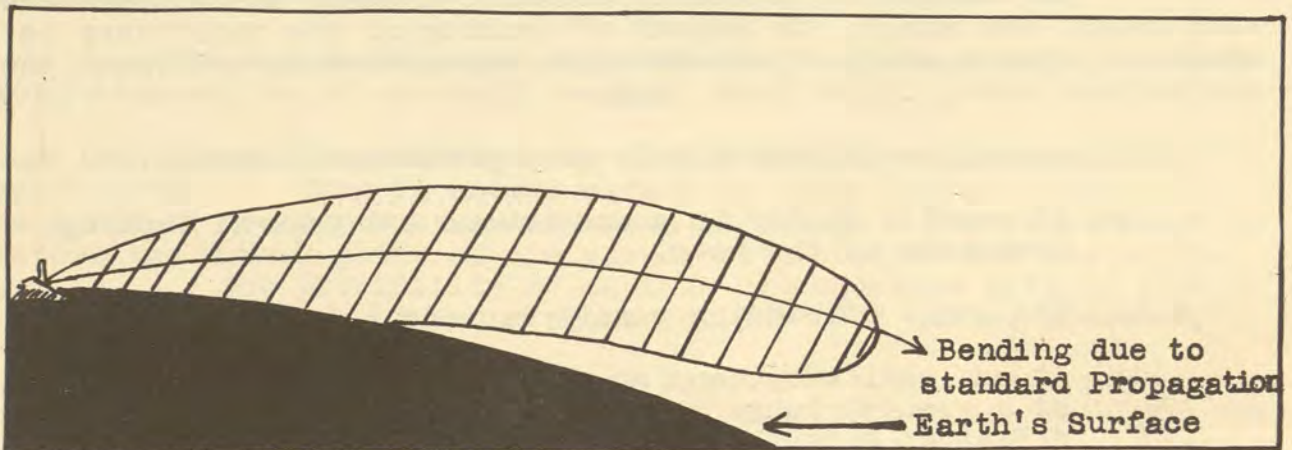
As changes in pressure, moisture content and temperature with height are small, the amount of bending of the radar wave is small. From a study of observations made overseas and round the Australian coast, it is found that:-

- (i) Anomalous propagation is most pronounced below 2,000 feet
- (ii) It results mostly in a continuous and gradual bending downwards of the wave.
- (iii) The angle of bending rarely exceeds  $\frac{1}{2}$  degree.
- (iv) At any altitude, bending upwards at one range and downwards at a greater range may occur, resulting in a blanketing effect on targets within the zone.
- (v) Coastal fronts, when the Radar is looking across them, are almost invariably productive of conditions suited to anomalous propagation.
- (vi) Subsidence effects are mostly to be expected above 4,000 feet. The sketches on pages 38 and 39 illustrate the idea very roughly.



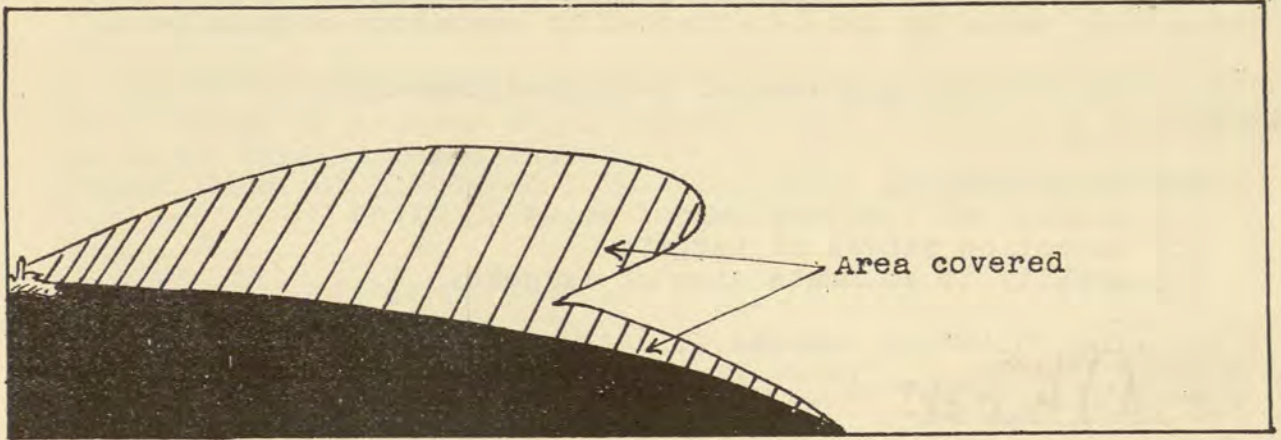


1. THEORETICAL. The natural path of the Radar Wave follows a straight line.

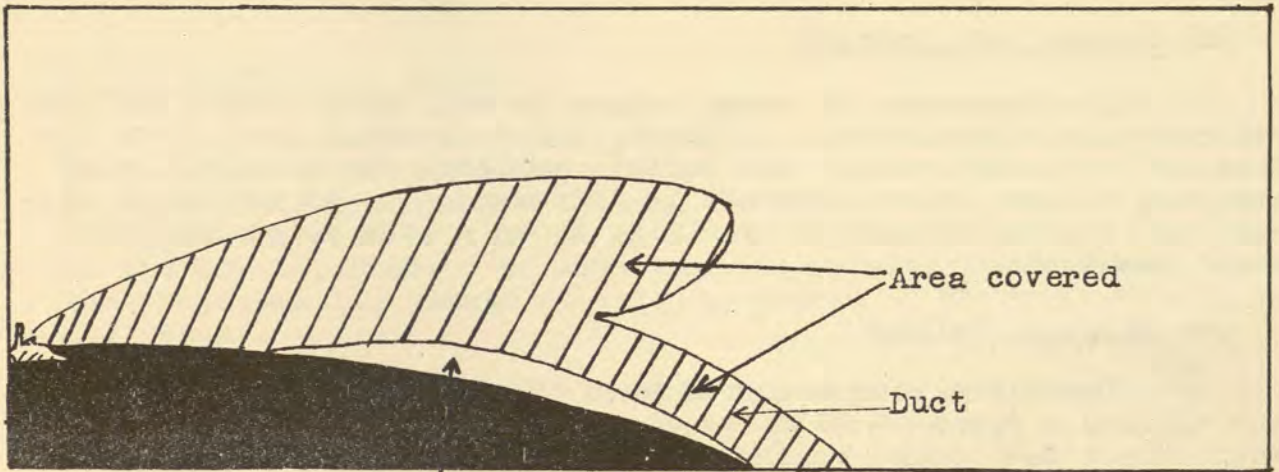


2. PRACTICAL. The natural path is ALWAYS influenced by weather conditions. Standard propagation results in very gradual and continuous bending downwards.





3. & 4. PRACTICAL. The results of sharp changes in temperature and moisture content gradients are generally the distortion of the lower part of the lobe coverage diagram.



4. Uncovered area  
Ships would not be detected here.



Effects of refraction are negligible when the angle of elevation of the target is over 1 degree. Therefore the use of Radar for fire control or for the direction of fighters up to about 40 miles will normally not be affected by anomalous propagation.

The following phases of Radar are definitely affected, however:-

- (a) Heightfinding
- (b) Control of fighters beyond about 40 miles
- (c) Detection ranges of targets
- (d) Ability to estimate size of targets.

The following remarks illustrate this:-

(a) Heightfinding

Heightfinding of aircraft by type 281 has been up to 4,000 feet in error on occasion. H.M.A.S. "SHROPSHIRE" detected aircraft at 72 miles which according to the height graph were flying at 6,500 feet. The actual height of the aircraft was later found to be 2,500 feet. The performance of the 281 was checked and the Set found to be operating correctly. With the necessary meteorological information it would have been possible to have corrected the height graph.

(b) Control of Aircraft

The frequency of enemy radars is well established and the lobe curves can be plotted. Since, under abnormal conditions the lobes are reflected around the earth's surface, the possibility of detection of low flying aircraft is increased. An attacking aircraft would avoid detection by flying above a lobe which has been "bent" downwards.

(c) Abnormal Ranges

Occasions have occurred when echoes have appeared on the scan showing a range of 20 miles when the targets were 200 miles away. This was caused by the main lobe being reflected around the curvature of the earth's surface. Had the temperature gradient of the area been known by the ship, the Radar screen would have been correctly interpreted.

It is apparent, therefore, that the existence of weather conditions suitable for anomalous propagation will affect Radar policy, R.C.M. policy, Air Sea Rescue operations and A.S.V. patrols.

The extent of the effects of anomalous propagation will vary according to the wavelength or frequency of the Radar Sets.



One frequency, with a certain air temperature gradient, may offer less chance of detection of targets and greater possibility of being picked up by enemy receivers, where-as another frequency will offer the opposite results.

The collection of data concerning abnormal Radar performance is a matter of urgency and tabulated forms indicating the information required have been distributed to all ships under cover of Navy Office Secret Memo. 034319 dated 14th July, 1944, to facilitate this.

## 2. ANTI-SUBMARINE WEAPONS IN USE BY FLEET AIR ARM AND COASTAL COMMAND AIRCRAFT

The anti-submarine weapons employed by Fleet Air Arm and Coastal Command aircraft fall into two main groups:-

Those which depend for their effect on exploding within a certain distance from the target, according to the kind and amount of explosive; and

Those the effect of which depends on hitting and penetrating the pressure hull.

### Depth Charges and Bombs

The first group comprises the depth-charge and the A/S bombs which are fired by hydrostatic pistol or fuze. These have a lethal radius against a typical German U-boat ranging from about 8 ft. in the case of the 100 lb. bomb to about 28 ft. in the case of the 600 lb. bomb. If they explode outside these distances from the pressure hull, damage of varying degree to material and/or morale may result.

In view of the fact that the chance of placing the depth-charges or bombs within lethal range of the target falls off rapidly after a U-boat has been submerged for more than 15-30 seconds, these weapons each have a setting fixed to explode at an appropriate depth and adjusted to the explosive charge. These settings range from about 18 ft. to 35 ft. according to the weapon.

The depth-charge Mark XI is the most generally used weapon. It contains 185 lbs. of Torpex, giving a lethal range of 19 ft. and is fired at a depth of about 25 ft. Height and speed of release are limited to a maximum of 1,000 ft. and 250 knots by reason of the possibility of it breaking up on impact if released above those limits.



The 100 lb. A/S bomb Mark VI has recently been introduced for use by the Fleet Air Arm, for which it is especially suitable as the bomb load can be adjusted flexibly to meet conditions of take-off from carriers. It has not yet been used operationally. The charge consists of 49 lbs. of Torpex with lethal radius of about 8 ft. and is fired at about 18 ft. depth. Maximum height and speed of release are, at present, 150 ft. and 130 knots.

The 600 lb. A/S bomb, Mark I, is a Coastal Command weapon which is used to a somewhat limited extent. It can be released from 100 to 2,500 ft. without restriction as to speed. The explosive charge is 435 lbs. of Minol having a lethal radius of 28 feet and firing at 30-35 feet depth.

#### Rocket Projectiles and the Six-pounder.

The second group consists of the R.P. and the six-pounder gun. Both weapons have been introduced during the past two years and are intended for use against visible and, in the case of the R.P. only, very recently submerged submarines. The projectile, in the case of both weapons, consists of a solid steel head which is capable of penetrating the pressure hull if certain conditions of attack are observed. In the case of the R.P. penetration of the pressure hull can occur when the R.P. has travelled as much as 150 ft. under water.

Two types of R.P. head are used for anti-submarine attack. Both weigh 25 lbs but differ slightly in shape, each being suitable for a particular range of angles of aircraft dive and therefore used by various aircraft of the Fleet Air Arm and Coastal Command according to the best conditions of attack for the particular type of aircraft. In Coastal Command the employment of R.P. is at present confined to certain Liberators which are fitted with retractable launching rails for two rounds on each side of the fuselage, into which they can be withdrawn for reloading; this operation takes about two minutes in flight. In naval aircraft the R.Ps. are carried on the undersides of the wings, usually four on each, and cannot be reloaded in flight. Developments are in hand to increase the hitting power.

The six-pounder gun (57 mm.) is fitted only in some Coastal Command Mosquito aircraft. The magazine carries 24 rounds which are automatically loaded. Rate of fire is 60 rounds per minute but usually only about six rounds are fired in each attack which is opened at about 2,000 yards range, the aircraft diving at an angle of 25° - 45°.

Aircraft may carry a mixed load of A/S weapons usually consisting of depth-charges and R.Ps., thereby providing flexibility for attacking targets encountered under various conditions.



Aids to A/S Attacks

Bombsights of two types are in use by Coastal Command - Mark III (low level) for use up to 1,000 ft. height and Mark XIV which can be used from 1,000 ft. up to 20,000 ft. both of them by day and night. Aircraft equipped with the Mark III sight normally use depth-charges released from 50-300 ft., and those with Mark XIV use the 600 lb. A/S bomb which is released from altitudes of 1,200 - 2,000 ft. In the Fleet Air Arm, bombsights are not used at present for anti-submarine operations because of certain structural and optical limitations in naval aircraft which preclude the necessary view, but automatic radar-controlled bombsights are under development which will enable this aid to be incorporated.

Illuminants include searchlights and flares. These are used in conjunction with A.S.V. during the run-in to attack in order to illuminate the target.

The Leigh light searchlight is at present fitted in certain Coastal Command aircraft and produces a light of about 20 million candle-power with the broad beam used.

There are several types of flares. Coastal Command uses the 1.7-in., 4-in. and 4.5-in. types and the Fleet Air Arm the 4-in. type and a Rocket flare. The Rocket flare is fired from the aircraft in a climbing altitude and illuminates a considerable distance ahead of the aircraft and beyond the target.

Candle-power and duration of illumination of the various flares range from half a million to two million candle-power for from three seconds to three minutes.

Naval aircraft may also use a multi-cartridge ejector by means of which a continuous source of light is provided by firing a series of six illuminating cartridges.

(Admiralty Anti-Submarine Report,  
October, 1944).

3. NO "KNUCKLES" AT DEEP SUBMERGENCE

Recent reports of war patrols by U.S. submarines have indicated that it was believed that the success of evasion in some cases



could be attributed to the creation of "knuckles" while at deep submergence. This view is not borne out by tests at the United States Fleet Sound School, Key West, which reports:

".....tests were conducted to determine the ability of a submarine to create an effective knuckle when operating at a depth of 400 feet and making a speed of about four knots. The surface ship was unable to detect any evidence of echoes caused by knuckles. From these brief tests it appears that the knuckle is not effective when a submarine is operating at great depths. This generally bears out the experience of previous operations at the Fleet Sound School. It appears that the pressure at great depths prevents cavitation to the extent that it occurs at shallow depths when the submarine makes a sudden burst of speed and a sharp turn. It is apparently this area of cavitation that returns the echo."

On the other hand, knuckles at depths of 100-200 feet have repeatedly been proved to be one of the most successful evasive manoeuvres.

(U.S. Fleet Anti-Submarine Bulletin, October, 1944)

#### 4. GERMAN AND JAPANESE SUBMARINE OPERATIONS.

Final figures for October indicate that eight German and Japanese U-Boats were sunk - four German in the Atlantic, one Japanese in the Indian Ocean (sunk by a British submarine north-east of Sabang) and three Japanese in the Pacific Ocean area. The statement in the last edition of the Monthly Naval Warfare Review that no merchant ship was sunk by enemy U-Boat action was unfortunately made incorrect by the sinking on the 30th. October of an American merchant ship of 7,200 tons about 1,000 miles east of the Hawaiians. This was, however, the only sinking the U-Boats could claim in return for their own loss of eight boats.

During the month of November Allied Merchant Shipping losses by U-Boats totalled 5 ships of 22,000 tons. In addition eight ships totalling 12,500 tons were lost from marine risk. Preliminary figures indicated that four U-boats were sunk or probably sunk giving the enemy submarine fleets the doubtful honour, which has nevertheless been very difficult to obtain during recent months, of sinking just more than one merchant ship for each U-Boat sunk.



SECTION VIMATERIEL1. C.A.F.O's ON ANTI-SUBMARINE SUBJECTS

C.A.F.O. 1944	Subject	Brief Description
2370	Asdic, Echo Sounding and Hydrophones Periodical Reports on Defects	Information required
2372	Box Relay Pattern A.300	Voltage Required for Operations
2504	Attacks with A/S Ahead Thrown Weapons	Common Faults and their Cures
2538	Asdic Installation Type 135/B	Recorders - Contactor Units
2539	A/S Definitions	
2540	Power Supplies for Receivers of Asdic Sets, Types 132V/VS and 149X	Fitting of Third Motor Alternator, Pattern A 478 or 1337A
2542	Suppressor Units for L.F.M.A.s	Introduction of Modified Unit (Ships fitted with A.V.C. Receiver Q Attachment and Type 147B)
2543	Range Recorders A/S 285 and A/S 393	Introduction of New Depth Charge, Hedgehog and Squid Scales
2546	Bearing Recorders, Pattern A2097 and A2247	Speed of Paper Drive

Attention is also drawn to the following orders

2356, 2371, 2541, 2544 and 2545



SECTION VII

SHIPPING STATISTICS FOR  
SOUTH WEST PACIFIC

1. CONVOYS - OCTOBER, NOVEMBER, 1944

During November 38 merchant ships totalling 136,850 tons were convoyed in forward areas of the South West Pacific compared with 55 ships totalling 356,663 tons in October.

2. SINGLE ESCORTED SHIPS - OCTOBER, NOVEMBER, 1944

AREA	No. of Ships		Tonnage	
	October	November	October	November
West of Humboldt	2	7	13,390	42,499
East of Humboldt	6	5	55,671	35,806
Total	8	12	69,061	78,305



3. INDEPENDENT VESSELS - OCTOBER, NOVEMBER 1944

AREA	No. of Ships		Tonnage	
	October	November	October	November
Eastern States - Western States	47	45	291,508	283,122
Melbourne - South Australia	83	81	353,050	352,775
Newcastle - Melb- ourne	185	179	768,156	796,884
Brisbane - Sydney	123	140	608,849	712,484
Barrief Reef - Brisbane	83	99	319,353	450,454
West of Humboldt	202	211	1,397,287	1,366,474
East of Humboldt (including Coral Sea)	682	638	4,324,544	3,998,998
Arafura Sea	23	16	85,211	85,048
Total	1,428	1,409	8,147,958	8,046,239



4. MONTHLY OUTWARD GROSS TONNAGE - OCTOBER, NOVEMBER 1944

PORT	No. of Ships		Tonnage	
	October	November	October	November
Langemak	236	200	1,607,093	1,300,066
Humboldt Bay	204	192	1,370,391	1,289,128
Sydney	296	313	859,626	952,718
Melbourne	155	147	647,084	697,019
Milne Bay	99	103	595,711	477,632
Newcastle	194	195	464,792	422,493
Fremantle	63	62	408,011	395,485
Biak	57	77	366,424	381,179
Brisbane	83	67	402,688	327,747
Oro Bay	48	51	290,928	293,024
Townsville	53	61	201,088	247,286
Lae	54	38	330,496	201,000
Adelaide	57	40	185,483	184,911
Cairns	60	66	114,309	183,119
Port Kembla	47	35	143,296	128,946
Whyalla	22	19	93,038	80,532
Wakde	46	15	288,862	80,055
Port Moresby	12	14	50,681	65,659
Thursday Island	25	17	81,151	42,396
Hobart	12	13	34,649	42,084
Darwin	8	7	26,487	35,985



5. SHIPPING SUNK BY SUBMARINES OFF AUSTRALIAN COAST

Time and Date	Ship	Tons	Position	Remarks
<u>1942</u>				
2237K 3/6	IRON CHIEF-TAN (Aus.)	4812	33° 55' S, 151° 50' E	Torpedoed - Independent
1845K 4/6	IRON CROWN (Aus.)	3353	38° 17' S, 149° 42' E	Torpedoed - Independent
0116K 11/6	GUATEMALA (Pan.)	5967	33° 40' S, 152° 04' E	Torpedoed - Straggler
2300K 20/7	LIVANOS (Gr.)	4835	35° 19' S, 151° 08' E	Torpedoed - Independent
1600K 21/7	COAST FARMER (U.S.)	3290	35° 30' S, 150° 55' E	Torpedoed - Independent
0530K 22/7	Wm. DAWES (U.S.)	7177	36° 45' S, 150° 20' E	Torpedoed - Independent
0045K 3/8	DUREENBEE (Aus.)	223	35° 56' S, 150° 24' E	Gunfire - Independent
0010K 7/8	MAMUTU (Br.)	300	09° 11' S, 144° 16' E	Unknown - Independent
<u>1943</u>				
0030K 18/1	KALINGO (Aust.)	2047	33° 47' S, 152° 10' E	Torpedoed - Independent
0130K 7/2	IRON KNIGHT (Aust.)	4812	36° 51' S, 150° 38' E	Torpedoed - Straggler
0522K 10/2	STAR KING (U.S.)	7176	34° 15' S, 154° 20' E	Torpedoed - Independent
1400K 11/4	REGINA (Yugo.)	4732	37° 24' S, 150° 19' E	Torpedoed in convoy
1900K 24/4	KOWARRA (Aust)	2125	24° 17' S, 153° 40' E	Torpedoed Independent



SHIPPING SUNK BY SUBMARINES OFF AUSTRALIAN COAST (Contd.)

Time and Date	Ship	Tons	Position	Remarks
<u>1943</u>				
0101K 26/4	LIMERICK (Br.)	8724	28° 54'S, 153° 54' E	Torpedoed in convoy
1845K 27/4	LYDIA M. CHILD (U.S)	7176	33° 08'S, 153° 24' E	Torpedoed - Independent
1040K 29/4	WOLLONGBAR (Aust.)	2239	31° 11'S, 153° 05' E	Torpedoed - Independent
1335K 5/5	FINGAL (Norw.)	2137	30° 33'S, 153° 30' E	Torpedoed in convoy
0400K 14/5	CENTAUR (Br.)	3222	27° 17'S, 154° 05' E	Torpedoed - Independent
1715K 16/6	PORTMAR (U.S.)	5551	31° 03'S, 155° 49' E	Torpedoed in convoy
<u>1944</u>				
0255K 25/12	ROBERT J. WALKER (U.S)	7180	36° 05'S, 150° 43' E	Torpedoed - Independent
TOTAL	20	86078		Convoys 4, Stragglers 2, Independent 14

Forty-eight ships have been attacked off the Australian coast since the outbreak of war. Of these attacks 20 have resulted in sinkings and 11 in damage to the ship while in 17 cases the ship has escaped undamaged. Four of the successful attacks were made by day and 16 by night and three of attacks which resulted in damage were made by day an eight by night.







