

ADFDA ARCHIVE  
LEDGER

SECRET

No:

59

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. 0233/43 (5)

SOUTH-WEST PACIFIC

# ANTI-SUBMARINE REPORT

OCTOBER, 1943

*File reclassified as:*

OPEN

2/3/05

SECRET

THIS DOCUMENT HAS BEEN REVIEWED AND DECLASSIFIED	
FILE REF: <del>1022</del> 2005/1023664/1	FOLIO 10
NAME: JOHN MADDOCK	DATE: 2/3/2005
SIGNATURE: <i>John Maddock</i> <i>John Maddock</i>	42/80

A.C.B. 0233/43 (5)

SOUTH-WEST PACIFIC

ANTI-SUBMARINE REPORT

OCTOBER, 1943

ANTI-SUBMARINE  
WARFARE DIVISION,  
NAVY OFFICE,  
MELBOURNE.

C11980

SECRET

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. 0233/43 (5)

SOUTH-WEST PACIFIC

ANTI-SUBMARINE REPORT

OCTOBER, 1943

ANTI-SUBMARINE  
WARFARE DIVISION,  
NAVY OFFICE,  
MELBOURNE.

C11980

CONTENTS

Section I.

COUNTER MEASURES

1. Review for September
2. An Attack off the Australian Coast
3. Regaining Contact
4. "South West Pacific Convoy Instructions"
5. Communications
6. Training Film
7. Convoy Escort Organisation
8. A/S Elliptical Target
9. Sea-Air Liaison

Section II.

ENEMY ACTIVITY

1. Japanese Submarine Activity - Map for September
2. Damage to A/S Defences
3. Analysis of Enemy Submarine Attacks, 1943
4. Analysis of Convoys - August, September

Section III.

NARRATIVES

1. Jap. Submarine Sunk
2. U-boat's Comedy of Errors
3. Another Success to H.M.N.Z. Ships
4. An Ill-Fated U-boat
5. U.S. Destroyer's Success

Section IV.

INTELLIGENCE

- 1. German U-boats in Indian Ocean
- 2. Japanese Destroyer Torpedo
- 3. New Types of German U-boats
- 4. Japanese Midget Submarine
- 5. German Acoustic Torpedoes
- 6. Japanese Anti-Submarine Measures

Section V.

MISCELLANEOUS

- 1. Asdic Conditions in S.W.P.A.
- 2. Japanese Destroyer Losses
- 3. Heavy Toll of U-boats
- 4. Jap Aircraft Carriers
- 5. Japanese Shipping Losses
- 6. Honourable Hush Hush
- 7. Japanese Submarine's "Success"
- 8. The Submarine War - German Version
- 9. The Submarine War - British Version
- 10. M.L. Hunting Groups

Section VI.

MATERIEL

- 1. The "Squid"
- 2. Echo Sounding Reports
- 3. H.T. Connectors
- 4. Battery Boxes
- 5. Depth Charge Patterns for Fairmiles
- 6. Depth Charges

ILLUSTRATIONS

The Sinking of "U-432" . . . . . Page ... 12

Sinkings of U-boat - Worldwide . . . . . Page ... 32

Allied Shipping Losses - Worldwide . . . . . Page ... 34

The "Squid" . . . . . Page ... 39

Escort Carrier . . . . . Page ... 42

Japanese Submarine Activity -  
Map for September

Appendix I

SECTION ICOUNTER MEASURESI. REVIEW FOR SEPTEMBER

The Allied advances in New Guinea during September resulted in a concentration of Japanese submarine activity in the area between Rabaul and the North coast of New Guinea. Japanese submarines were also reported in the Solomons Area and there were indications towards the end of the month that one submarine may have been moving southwards towards the east Australian coast.

There were several attacks by Allied ships and aircraft in the New Guinea area, but Japanese submarines scored no successes during the month in spite of fairly extensive movements by sea of Allied troops.

On September 3 the U.S. destroyer "ELLET" attacked a submarine contact in position 30° 30' S 165° 28' E and the attack may have been successful. Allied destroyers attacked a submerged submarine off the coast of New Guinea near Salamaua on September 10 and Allied P.T. Boats depth charged a submarine about 60 miles north of this position on September 19.

A reconnaissance aircraft claimed to have sunk a Japanese submarine 70 miles south west of Rendova Island on September 12. Next day another aircraft scored a bomb hit on the stern of a submarine. The U-boat disappeared 10 seconds later leaving an oil slick 200 feet in diameter.

During the month a number of attacks were made on submarines operating on the Rabaul-New Guinea shuttle service. A large Japanese submarine was attacked on the evening of August 28 in position 6° 45' S 151° E. The Catalina which made the attack considered that the submarine was equipped with Radar.

One submarine, estimated at 300 feet long, was strafed on September 21, damage being done to the submarine's deck cargo. A Liberator attacked another submarine engaged on the supply service on September 9, while a Catalina made a similar attack three days later and an aircraft from the SouPac area made an attack on September 13.

An Allied reconnaissance plane reported being fired on by a surfaced submarine at 1530K on September 21 in position 7° 05' S 132° 30' E.

Photographs at Rabaul showed three submarines in harbour on September 3 and five on September 20.

## 2. AN ATTACK OFF THE AUSTRALIAN COAST

While escorting Convoy G.P. 72 in position 31° 11' S 153° 15' E at 1157L on October 7, a torpedo was sighted by officers and lookouts in H.M.A.S. "GLENELG".

The torpedo was reported by the duty signalman, and the Officer of the Watch took appropriate action and gave the alarm. After approaching "GLENELG" on the starboard quarter the torpedo began to alter course in an erratic manner. It overtook "GLENELG" on the starboard side about 100 yards away, broke surface 150 yards ahead of the A.M.S., and then swept round to return between "GLENELG" and the convoy, constantly breaking surface.

When it had reached a position abaft "GLENELG's" beam the torpedo swerved towards the stern of the convoy and was last seen in a splash indicating that it had dived.

The torpedo was clearly seen by all "GLENELG's" officers and by many of the ship's company. It appeared to be similar to the 21-inch type, and was of polished steel with no obvious marking or colouring. The noise of its propeller racing when out of the water was quite audible.

"GLENELG" altered course, gained contact on her Asdic at 1200 yards, and made a number of energetic attacks in which 37 depth charges were dropped.

At 2337L on October 12 a reliable D/F fix placed a Japanese submarine within 100 miles of 27° 40' S 160° E. The submarine attacked by "GLENELG" could have reached this position at 3 knots.

Following the attack on "LST 469" and S.S. "PORTMAR" on June 16, a Japanese U-boat was placed by D/F fix in position 30 S 159 E. It appears that both these submarines followed a similar course after making their attacks.

## 3. REGAINING CONTACT

Reports of attacks on submarines and suspected submarine contacts in this area indicate that some ships are not carrying out the correct drill. There have been several cases where the attacking ship, after dropping a pattern of depth charges, has not opened the range sufficiently to attain a favourable position in which to turn and point ship towards the target. After an attack Commanding Officers should manoeuvre to a position between 1000 and 1500 yards from the submarine.

The Admiralty has analysed 130 hunts by single A/S vessels and 30 hunts by two A/S vessels in order to find out the chances of regaining contact when it is lost after a depth charge attack. The results were as follow:

	One Attacking Ship	Two Attacking Ships
(1) Percentage of hunts in which U-boat was sunk or probably sunk	12 per cent	27 per cent
(2) Percentage of unsuccessful attacks which were actually followed by a further attack (i.e. regained contact and tried again).	54 per cent	86 per cent

These figures are a good indication of the importance of the second A/S vessel to "direct" while the other is "attacking". A further analysis has shown that there is no evidence in favour of hurried attacks during deliberate hunts.

An adequate search may be understood as one lasting up to about 90 minutes after the preceding attack. It is realised that escorts very often have to rejoin their convoys without an adequate search, but it can be shown that the number of U-boats destroyed would probably be increased by about 30% if searches up to 90 minutes were carried out after loss of contact. In the majority of cases contact would be regained in a very much shorter time than 90 minutes.

If the search is prolonged beyond 90 minutes more than one A/S vessel should be employed.

The hunts reviewed indicate that the chances of regaining contact in the three half-hour periods after losing contact are as follow, assuming that contact is not regained during the previous period.

	1st Half-hour	2nd Half-hour	3rd Half-hour
Single Ship	50 per cent	29 per cent	8 per cent
Two Ships	70 per cent	60 per cent	33 per cent

A study has also been made of the results obtained in U-boat hunts during the whole of 1941 and the period July 1942 to March 1943.

The analysis shows that about one in six of all U-boat hunts in which a U-boat is known to have been present was successful. The number of successes per depth charge attack averaged about 6 per cent. The figures showing the effectiveness of attacks at varying stages of the hunt help to explode the myth that it is very difficult to keep contact after an attack.

The first three attacks each have the same expectation of success, the next three have less than half this expectation, and attacks from the seventh onwards each have about three times the average expectation.

Percentage of attacks which have succeeded in destroying U-boats.

1st to 3rd Attacks (" Early ")	4th to 6th Attacks (" Middle ")	7th etc. Attacks (" Late ")
5½ per cent	2 per cent	14 per cent

In the first three attacks there is a fair chance of scoring a knockout. Then the chances of scoring a knockout grow smaller, but the chance of wearing out the U-boat increases rapidly as the hunt proceeds.

Two other interesting points arising from the investigation are:-

(i) The results of the investigation were reached by counting the number of attacks delivered. The conclusions are not modified significantly if the hunts were measured by the total number of depth charges dropped.

(ii) The necessity of dropping a full pattern of charges where possible for all attacks, including counter attacks, was most apparent.

#### 4. "SOUTH WEST PACIFIC CONVOY INSTRUCTIONS"

"SOUTH WEST PACIFIC CONVOY INSTRUCTIONS", which are based on "ATLANTIC CONVOY INSTRUCTIONS", were issued during October to all Asdic fitted ships in this area. "GENERAL INSTRUCTIONS FOR ESCORTS OF CONVOYS", which were issued as a temporary measure, are now cancelled.

Any Asdic fitted ship operating in the South West Pacific Area which has not received A.C.B. 0234 (S.W.P.C.I's) should request a copy from A.C.N.B., U.S.N. ships requesting from the U.S. Distributing Office.

#### 5. COMMUNICATIONS

A common signal doctrine for use by Allied warships in anti-submarine operations in the South West Pacific Area was introduced during October, and the "COMBINED SUBMARINE ATTACK TABLE" (ABR 1) was issued to all Asdic fitted ships. It will be noticed that no flag is provided for "doppler", and it is intended that ships will use R/T or V/S to pass this information.

The "COMBINED SUBMARINE ATTACK TABLE" will overcome difficulties experienced in maintaining communications between the ships of the different Navies operating in this Area.



## 6. TRAINING FILM

It is intended to produce a training film in co-operation with the R.A.A.F. The film will illustrate the Operations Section of "SOUTH WEST PACIFIC CONVOY INSTRUCTIONS".

## 7. CONVOY ESCORT ORGANISATION

Convoy escort vessels under the operational control of C.S.W.P.S.F. will shortly be organised into groups.

Commanders (D) have been established at Sydney and Cairns. They will be responsible to N.O.I.C. Sydney and N.O.I.C. Cairns respectively for the training, efficiency and administration of the escort vessels under their command.

This instruction in no way interferes with the present function and responsibilities of Allied Administrative Authorities.

Practice requirements for working-up and refresher training will be met by Commanders (D) in collaboration with the respective N.O.I.C. Accounting, victualling and storing procedures will remain as at present.

## 8. A/S ELIPTICAL TARGET

Reports of the operation of the A/S Eliptical Target indicate that echoes vary considerably, but the target at Sydney has already proved a valuable training appliance, calling for a high degree of concentration from operators under instruction.

Asdic contact has been gained at 1400 yards, the target being held down to 200 yards, and then the range has been opened to 2000 yards while still in contact. Recorder traces are good below 1200 yards.

At a range of 1000 yards the extent of target is  $4^{\circ}$ , and doppler effect is fair. At ranges under 500 yards it is difficult to distinguish the target echo from wake echoes of the towing ship.

## 9. SEA-AIR LIAISON

It has been arranged with Air Board for R.A.A.F. Officers engaged on convoy protection to take passage in escort vessels, and for officers of escorting warships to embark in aircraft.

It is important that Naval and Air Force Officers should learn and appreciate each other's difficulties, and it is considered that the liaison which has been arranged will produce more effective co-operation between ships and aircraft employed on convoy protection.

Some Air Force Officers have already taken passage in escorts, and much benefit has been derived from the suggestions put forward by both Commanding Officers of escorts and pilots.

Commanding Officers of Escort Vessels should make application on behalf of their officers through the appropriate N.O.I.C. who is to instruct the Naval Liaison Officer at the Air Operations Room to make the necessary arrangements with the R.A.A.F.

R.A.A.F. Officers wishing to embark in escorts should apply through R.A.A.F. channels to the appropriate N.O.I.C. via the Naval Liaison Officer at the Air Operations Room. When possible the R.A.A.F. Officer should be accommodated in the ship of the Senior Officer.

## SECTION II

ENEMY ACTIVITY1. JAPANESE SUBMARINE ACTIVITY - MAP FOR SEPTEMBER

See Appendix I at back of this report.

2. DAMAGE TO A/S DEFENCES

An area of 170 feet of the scaffolding underwater defence in Cockburn Sound, Fremantle, was badly damaged during September and it is possible that an enemy midget submarine attempted penetration.

The scaffolding was heavily battered from seaward and seven hurdles were forced back to a maximum distance of 35 feet. One hurdle was overturned after fracturing one of the main verticals to which the adjoining hurdle was connected. Depth of water in the vicinity of the damaged defences is about 2½ fathoms.

U.S.N. aircraft sighted a possible submerged submarine in the vicinity of Rottnest Island on September 9, and according to a signal from A.O.R. Western Area a search by R.A.A.F. planes definitely established the presence of an enemy U-boat. An air-sea search was carried out without result.

It is possible that an enemy submarine attempted to penetrate the Cockburn Sound defences, but the cause of the damage to the scaffolding has not yet been determined.

3. ANALYSIS OF ENEMY SUBMARINE ATTACKS 1943

Month	No. of Attacks	No. of ships sunk	Tonnage	No. of ships damaged	Tonnage
JANUARY	4	1	2,047	2	17,398
FEBRUARY	2	2	11,988	-	-
MARCH	1	-	-	-	-
APRIL	6	5	24,996	-	-
MAY	8	2	5,359	1	5,832
JUNE	4	1	5,551	1	3,000
JULY	-	-	-	-	-
AUGUST	-	-	-	-	-
SEPTEMBER	None Reported	-	-	-	-

4. ANALYSIS OF CONVOYS - AUGUST, SEPTEMBER

AREA	No. of Ships		Tonnage	
	August	September	August	September
Thursday Is. - Darwin	13	15	27,020	39,139
Barrier Reef - Brisbane	84	91	351,270	406,224
Brisbane - Sydney	71	59	271,324	214,264

(Continued)

AREA	No. of Ships		Tonnage	
	August	September	August	September
Newcastle - Melbourne	140	128	516,462	492,441
Coral Sea	192	187	820,928	954,767
Arafura Sea	4	8	5,669	18,984
TOTAL	504	488	2,279,472	2,125,819

SECTION IIINARRATIVES1. JAP SUBMARINE SUNK

The U.S. Destroyer "RADFORD" sank a Japanese submarine, believed to have been of the "I.1" class, off the east coast of Rendova Island, in the Solomons, on July 1. "RADFORD" obtained Radar contact while carrying out an anti-submarine sweep in Blanche Channel and closed the submarine undetected until within 2,000 yards.

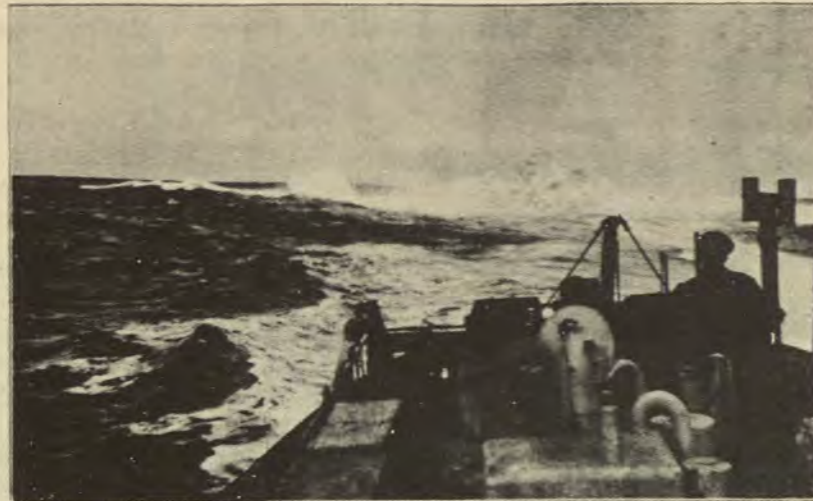
The destroyer then illuminated the target and opened rapid fire smashing the enemy submarine's conning tower with the first salvos. One torpedo with a shallow setting was fired but no results were observed. Fire was also opened with 40 m.m. and 20 m.m. guns and hits were observed, while the salvos from the main armament continued to straddle and hit the U-boat.

Range was closed to 1,500 yards, but the submarine, which began to settle slowly on an even keel, made no attempt to dive. Gradually, however, the U-boat sank and "RADFORD" approached and dropped an 11-charge pattern. Some two or three minutes after the last charge had exploded there was an underwater explosion astern of "RADFORD". Asdic contact was lost and could not be regained. Searchlights showed that the water in attack area was covered with oil and debris.

2. U-BOAT'S "COMEDY OF ERRORS"

There is growing evidence of a rapid decline in the morale of German U-boat Officers and crews. Hitler has ordered that all U-boat crews should be feted as heroes when they return to port, but the Officers of "U-432" apparently believed that their chances of being feted were rather remote and they decided to celebrate at sea.

The story of the sinking of this U-boat would make excellent propaganda at one of Agnes Weston's Temperance Meetings, for "U-432" was lost because the hydrophone operator was washing up champagne glasses.

THE SINKING OF "U-432"

II



III



"U-432" was commanded by Lieutenant Schultze on her first seven patrols, and she claimed 120,000 tons of shipping - a claim which was probably most accurate. By the time Schultze relinquished his command the boat had become famous and her Polar Bear badge on the conning tower was well known.

When she cast off from her berth at La Pallice on February 14, 1943 there were scenes of great enthusiasm and the new Captain, Lieutenant Commander Hermann Eckhardt, was so busy acknowledging the plaudits of the onlookers that he neglected to give helm orders and rammed a harbour launch.

Eckhardt steered south and on February 19 received his orders. He decyphered the signal as a point in the neighbourhood of the Canary Islands, but after steering south for another two days he realised something was amiss. Looking through his signal books he found that he had failed to insert a correction issued prior to sailing and he had been ordered to Newfoundland.

"U-432" had been ordered to join a patrol line of 10 or 12 boats but, owing to the time lost on the wrong course, did not get into position until just before this patrol was disbanded.

In the forenoon of March 11, Eckhardt was proceeding on the surface to rendezvous with a supply U-boat. Just before dawn a number of explosions were heard and Eckhardt decided to submerge to listen on his hydrophones, but after a short while he surfaced again.

At 1200 he sighted a British destroyer which was stopped. Although Eckhardt did not know it, this was the destroyer "HARVESTER" which had rammed and sunk "U-444" earlier in the day and was damaged. "U-432" circled "HARVESTER" several times and decided to attack her. About 1300 she fired one torpedo at 600 yards and another from 700 yards both of which struck the destroyer, sinking her and killing a number of her crew.

The First Lieutenant then turned to Eckhardt and urged him to surface to see if there were any other ships in the vicinity. Eckhardt, however, had decided to submerge for dinner and a drink, and said "I will surface later on and see what is doing." The First Lieutenant, who was apparently an efficient officer, protested that U-boat officers were always taught to surface after an attack at periscope depth and the Coxswain also recommended surfacing.

However, Eckhardt remained adamant and "U-432" submerged to 20 metres (65 feet). The officers gathered in the Wardroom for a glass of champagne to celebrate their success, later attempting to identify from their books the destroyer they had just sunk.

Meanwhile the Free French corvette "ACONIT" which had been detailed to return to screen "HARVESTER", had sighted another U-boat on the surface and was steaming towards it. This U-boat submerged when it sighted the corvette. "ACONIT" began to transmit on her Asdic and gained contact with "U-432", although she believed that this was the submarine she had observed on the surface.

Meanwhile the officers and men in "U-432" had completely relaxed. The First Lieutenant had gone to his bunk for a sleep, most of the crew were still eating, and the hydrophone rating was engaged in washing up the champagne glasses. No one had heard "ACONIT" approach and when she dropped depth charges the crew were dumbfounded at the suddenness of the attack.

Eckhardt hurriedly ordered his men to action stations, and most of the crew still had their mouths full of food. The electric motors and the main lighting system were put out of action by the depth charges and "U-432" went down by the stern, losing trim to such an extent that she was forced down to a depth which the First Lieutenant estimated at 310 metres (1017 feet).

When at about 787 feet survivors heard the noise of a second pattern of depth charges, but these had been set to only 385 feet. At 300 metres (984 feet) the Stoker Petty Officers hardly dared look at the gauge and no one thought there was any chance of surviving. However "U-432" righted herself and began to rise slowly.

When "U-432" surfaced, and the conning tower was opened shells started to burst round her. Several men were killed by the first salvo and Eckhardt himself was killed by the second. Twenty survivors from "U-432" including the First Lieutenant were rescued.

The First Lieutenant later remarked that 1017 feet must surely be a record depth for any boat to have achieved this war and said he would like to inform the Admiral U-boats who would be sure to be deeply interested. The request was "Not Granted".

### 3. ANOTHER SUCCESS TO H.M.N.Z. SHIPS

The Japanese submarine "I-17", which had shelled an oil tank installation near Santa Barbara, California, in February 1942, was sunk off New Caledonia on August 19.

The kill was made by U.S. floatplanes after H.M.N.Z.S. "TUI" had carried out an energetic and successful attack with depth charges. "TUI" was escorting two U.S. supply ships when, in a position approximately 60 miles S.S.E. of Noumea, Asdic contact was obtained with a submarine at a range of 3,400 yards.

"TUI" made two attacks after which contact was lost, and, leaving aircraft to continue the search, "TUI" rejoined the convoy.

Some time later smoke was observed on the horizon in the direction in which the depth charge attacks had been made, and "TUI" returned to investigate. At 1755 white smoke was seen and at 1815 the submarine's conning tower was sighted. A few minutes later lookouts saw "I-17" on the surface emitting clouds of smoke and attempting to escape at high speed.

"TUI" opened fire with her 4" gun at 1834 and believes one hit was obtained at extreme range. Even at emergency speed "TUI" was unable to gain on the submarine. The aircraft, however, made a series of depth charge attacks and at 1905 the submarine sank at a sharp angle. Three minutes later two heavy underwater explosions were heard on the Asdic and were felt throughout the ship.

"TUI" steamed into a dense oil patch at 1940, a search of the area being carried on in darkness. Six Japanese survivors were rescued, and when interrogated at Noumea they stated that "TUI'S" depth charge attack damaged the submarine.

"I-17" was a modern submarine, built at Yosuka Dockyard, Japan, and launched on July 19, 1939. Larger than "I-1" sunk by H.M.N.Z.S. "KIWI" and "MOA" off Guadalcanal in January, "I-17" had a normal displacement of 2,563 tons. Other details were:-

Length overall .....	355 ft. 6 in.
Maximum breadth .....	30 ft. 6 in.
Speed (Surface .....	23.6 knots
(Submerged .....	8 knots
Cruising range at 16 knots .	14,000 miles
Aeroplanes carried .....	1
Complement .....	12 Officers
	85 Petty Officers and men.

### 4. AN ILL-FATED U-BOAT

"U-606" had a short life, but not a happy one. She started on her first patrol at the end of August 1942 and was sunk

six months later after sinking only two or three merchant ships.

"U-606" sailed from Bergen on August 22, 1942, but had not gone far when her Captain took ill and she had to put back to the Norwegian port where he was sent to hospital. The U-boat waited at Bergen for him to get well and the other officers divided their leisure between visiting him and entertaining his nurses on board the U-boat. In this way they drank the entire liquor supply in rather less than a week. Unfortunately the Captain sent down for a bottle from his private store, but after some attempt at evasion the officers had to admit that they had drunk that too.

Altogether it was not surprising that the Captain did not make much progress, and after a week he was relieved from duty and another Captain was temporarily given command. Orders to patrol in the North Atlantic were cancelled and the U-boat entered dry dock to be painted a light grey suitable for the Arctic Ocean.

She spent three weeks at Bergen then sailed northward chasing a convoy for six days without finding it. She contacted a westbound convoy, but the defence was so strong that she could not attack and on September 20 was so heavily depth charged that but for a little luck her career might have ended there and then. She was attacked by an aircraft the following day and returned to Bergen without having fired a torpedo.

The temporary Captain left and Lieutenant Hans Dohler took command. He was inexperienced and weak and was completely dominated by his First Lieutenant. The latter had served in "Admiral Hipper" during the Norwegian campaign. No man could have been more unpopular. High handed and cruel, he would see that comparatively trivial offences, such as stealing biscuits or cigarettes, were punished by terms in prison or on the Russian Front.

On October 16, "U-606" sailed for the North Atlantic still wearing her light grey Arctic paint. After 10 days at sea she joined a pack of U-boats and two days later fired four torpedoes at the Norwegian Whale Factory "KOSMOS II" scoring hits with two of them. The Norwegian remained afloat and two hours later "U-606" attacked again. This time the whale factory broke in two and sank, but Dohler was unaware that he had torpedoed the same ship twice and claimed two merchantmen totalling 19,600 tons.

A week passed and "U-606" contacted an independent ship which he followed for several hours, intending to attack under cover of darkness. He discovered, though, that another U-boat was stalking his prey. The merchant ship was more than a match for the two of them, however, and left them ruefully counting their wasted torpedoes. "U-606" had used three and the other U-boat eight and both

Commanding Officers were reprimanded for their extravagance.

On December 5 "U-606" limped into Brest with two cylinder heads cracked after 50 days at sea. About a month was spent in harbour while the U-boat was docked.

On New Year's eve three or four Petty Officers went to wish their Captain a Happy New Year and found that a party was in progress. They opened the door and saw a vast array of bottles, some extremely dishevelled officers and a number of equally dishevelled women. Next morning there was trouble on board but the men, determined to make public their officers' behaviour, replied to the Captain's threats with an insistent demand for a Court Martial. The Captain however, had had the happy thought of inviting the Flotilla Commander to the party and the affair was hushed up!

The men were not in a pleasant mood when the U-boat put to sea for her last cruise on January 3. The atmosphere became more and more strained during the seven weeks which passed before the first convoy was sighted. At last, on the morning of February 22, the U-boat sighted a convoy, followed it astern all day, and at night closed to attack. She was one of 10 U-boats. "U-606" fired four torpedoes claiming 3 hits and then went hard a'port to escape.

But she was not quick enough. The Polish escort "BURZA" had made asdic contact and her attacks forced Dohler to dive to a great depth. The men saw the depth gauges reach 200 metres and still go on, but even more terrifying was the creaking and groaning of the boat itself as the water pressure grew. The engineer officer made a hurried inspection and found that, due to bad workmanship or faulty material, there was a weak spot near the after diving tank and a crack was beginning to show in the pressure hull.

The Engineer Officer hurried to the Captain with the news, telling him that the boat could not last more than half an hour. The tanks were blown and, as the U-boat shot to the surface at a steep angle, the First Lieutenant's nerve gave way. Completely losing control of himself he ran through the U-boat and tried to get out through the after hatch. The Captain had to restrain him forcibly.

When the U-boat reached the surface things looked better. The Engineer Officer was more cheerful and thought that "U-606" would keep afloat for at least two hours. The bridge had been knocked about by the depth charges, the conning tower was jammed and their periscopes and hydrophones were useless, but the engines were undamaged and the lights were still burning.

Between 1900 and 2000 the same night U.S.C.G. Cutter "CAMPBELL" found her running blindly through the darkness. She made Radar contact at 4200 yards and Asdic contact at 1200 yards and closed the U-boat, despite a collision on the way with another submarine. "CAMPBELL'S" engine room was flooded but she attacked "U-606" with gunfire and depth charges.

By this time Dohler and a party of men had reached the upper deck, and by signalling with flash light, they eventually persuaded "CAMPBELL" to cease fire. The men on deck found that the Captain had disappeared - probably a victim of "CAMPBELL'S" fire. All the other officers had remained below and a Chief Petty Officer found himself in charge. After the earlier experiences of the night this was too much. He at once gave orders to abandon ship and every man jumped overboard. Not one of them was seen again.

Three officers, including the First Lieutenant and the Engineer Officer, three Petty Officers and six ratings had remained below. They heard the gunfire die away and after a prudent interval came up on deck. About 2100, boats from "BURZA" and "CAMPBELL" closed, and the Germans abandoned ship.

One Petty Officer seized the opportunity to pay off old scores. He went up to the First Lieutenant, said "I have waited a long time to do this," and hit him hard in the face.

The conning tower of their U-boat was still visible as the men climbed aboard the rescuing ships. One of the men, looking at her, cried "what sins have I committed in my life that I should have been sent to such a boat!"

## 5. U.S. DESTROYER'S SUCCESS

A U.S. destroyer probably sank a Japanese submarine on the afternoon of September 15 110 miles south south-east of San Cristobal Island.

The submarine was forced to the surface after a vigorous depth charge attack and then the destroyer opened fire, scoring several hits on the conning tower.

A Catalina joined in the hunt as the U-boat submerged and the aircraft dropped two depth charges. A few minutes later there was a loud underwater explosion and a large quantity of

debris and oil appeared on the surface.

A feature common to this and to the two other probably successful anti-submarine attacks during August and September described in this Section was that loud underwater explosions were heard after the explosion of the depth charge patterns. Debris came to the surface after these explosions.

SECTION IVINTELLIGENCE1. GERMAN U-BOATS IN INDIAN OCEAN

There are indications that a German U-boat base has been developed at Penang. The base is estimated to accommodate at least six submarines, but is capable of rapid expansion.

One German U-boat arrived at Penang in July and proceeded to Japan, while another, which arrived at about the same time, was due for docking at Singapore towards the middle of September.

Two more German submarines arrived in August and five more are expected. The U-boats based on Penang, which has been a Japanese submarine base for some time, are considered to be of the 750-ton type.

The policy at present appears to be for German U-boats to operate west of 070° with a focal area including Aden and the Persian Gulf and for Japanese submarines to remain east of 070° with a focal area including the Bay of Bengal.

There were indications that two Italian submarines were at Singapore and one at Sabang at the time of Italy's capitulation. These were all blockade runners and it is thought that they had been ordered to scuttle or escape in the event of capitulation.

2. JAPANESE DESTROYER TORPEDO

An examination of Japanese destroyer 24-inch torpedo reveals estimated characteristics as follows:-

27 knots to 24,000 yards, 31 knots to 16,000 yards, and 38 knots to 10,500 yards.

The markings indicate a possible maximum range of 27,000 yards. A speed of 45 knots can be used to a range of 6,500 yards. The torpedoes are fitted with gyro mechanisms and probably carry a 900 lb. charge warhead.

3. NEW TYPES OF GERMAN U-BOATS

Further details are now known of the three new classes of German U-boats which have recently been put into service - the 1,600-ton operational and minelaying boat, the 1,600 ton supply boat and the 1,000-1,200 ton operational boat. The first class built by the Germania Yard at Kiel can apparently be used as either operational boats or as minelayers; in the latter case it is believed that they would carry fifty four mines in eighteen mineshafts. Six have been completed.

Thirteen or fourteen of the 1,600 ton supply U-boats have been built by the Deutsche Werke, Kiel. These have an exceptionally broad beam and are known familiarly as "Milch Cows." They carry fuel, 30 or 40 tons of stores, and some spare parts for operational U-boats and sometimes also act as a "post office". Some carry a medical officer. "U-464", a boat of this class was sunk in a position to the south-east of Iceland by a United States Navy aircraft on the 20th August, 1942.

The 1,000-1,200 ton boats are intended to operate at great distances from base and therefore have an exceptionally large fuel capacity. The Deschimag Yard at Bremen has constructed about twenty of them.

4. JAPANESE MIDGET SUBMARINE

It is now known that besides being carried on the deck of large type submarines, Japanese midget submarines are also carried in some seaplane carriers, and possibly in whaling vessels. The holds of certain seaplane carriers such as the "NISSHIN" (sunk) and the "CHIYODA" were specially equipped for this purpose.



The special equipment of the "CHIYODA" includes a huge hold running through the centre of the ship, four sets of 7 ft. tracks running lengthwise through the hold, twelve sets of trucks, (each set numbering from two to three trucks), a hatchway which can be extended 80 feet by removing 4 beams from the beam shelves, and powerful cranes capable of lifting the 40-50 ton midget submarines. On the "CHIYODA" cranes 2 and 4, which are on the port side, are used for this purpose.

The Kō-Hyōteki (deck model midget submarine) carried on the "CHIYODA" is 77 ft. 6 in. from stem to stern (not including the protruding torpedo tubes, nose guard and propeller guard), and has a maximum vertical hull diameter of 6 feet with a conning tower extending about 4' 6" above this. It is fabricated in three sections, which are joined by internal flanges bolted and possibly welded together.

The hull is then divided into ten "kibun" or "units" of equal length, irrespective of where their lines might cut through the functional units of the ship.

The outer skin of the ship consists of .315 in plates in the midship section and .276 in. plates in the forward and after sections.

To lift the submarine on board, a hoisting belt is dropped from each of two cranes which can be swung out at right angles to the gunwhales. The belts form a loop extending about 13 feet below the surface. The submarine is towed into position within these loops which are then adjusted to the proper places around the midget by fore and aft ropes secured to the conning tower. All these operations are performed by seamen in a small boat alongside and not by members of the submarine crew. The cranes are then swung back and the submarine is hoisted into the hold and lowered on to the trucks. The midget is either stored on these trucks or is transferred to a cradle.

Several midget submarines can be carried by a single mother ship, although this would necessarily decrease the capacity for planes. Planes are lifted in and out of the hold through a second hatchway slightly to the rear of the submarine hatchway, but are presumably stored in the same hold and moved by trucks on the same tracks.

The following is a comparison of the midget submarines described above and those sunk in Sydney Harbour.

	Mato *	Kō Hyōteki **
Hull Length	74' 3"	77' 5"
Forward Section	17'	17' 8 $\frac{1}{2}$ "
Midship Section	34' 11"	35' 1 $\frac{1}{2}$ "
After Section	22' 4"	24' 8"
Nose-guard	3'	No data
Propeller guard	3' 3"	No data
Over-all Length	80' 6"	82' 4"
Maximum Diameter	6'	6'
Conning Tower	4' 6"	4' 6"
Periscope above Conning Tower	5'	No data
Hull	$\frac{1}{4}$ " plate	.276" - .315" plate
Torpedoes	2 - 18"	2 - 18"

\* Japanese designation for the type of midget submarine recovered in Sydney Harbour.

\*\* Japanese designation for the type of midget submarine described above.

## 5. GERMAN ACOUSTIC TORPEDOES

Although there is no evidence of Japanese submarines using acoustic homing torpedoes of the type fired by German submarines, it is possible that the presence of German U-boats in the Indian Ocean may result in the Japanese adopting the idea.

German U-boats have used the new torpedoes against escorts. Fitted with contact fuses and possibly with influence fuses, the torpedoes are thought to be electric and may be impossible to detect by hydrophone effect.

Their range is at least 3,000 yards. The homing speed is thought to be not more than 20 knots, although the torpedo

may have a higher speed earlier in its run. The homing range on an escort is about 300 yards.

The greatest danger area for escort vessels attempting to attack U-boats is directly ahead or astern of the submarine. German tactics so far have been to fire the acoustic torpedoes from astern tubes at ranges of between 2,500 and 3,000 yards while diving or just after submerging.

If it is suspected that acoustic homing torpedoes are being employed, anti-submarine vessels should adopt the following tactics. Escorts should close a surfaced U-boat at high speed in the same way as for a normal attack but when the enemy dives or is about 3,500 yards away an alteration of course of at least 45° should be made if it is necessary to avoid the area of greatest danger. When asdic contact is gained a normal attack may be carried out, provided the anti-submarine vessel avoids a position directly ahead or astern of the submarine.

Escort vessels should work in pairs where possible. If the submarine is found to be below 100 feet normal hunting procedure may be adopted as attacks with acoustic torpedoes by a U-boat at this depth are considered unlikely.

## 6. JAPANESE ANTI-SUBMARINE MEASURES

The following information on the escorting and anti-submarine tactics of Japanese aircraft and surface craft is taken from a report prepared by the Commander, South West Pacific Force Advanced Intelligence Centre.

Close and efficient co-operation between enemy ships and aircraft has been observed by U.S. submarines operating in Japanese waters.

"The Japanese have been making effective use of their aircraft, especially float planes, in hunting and checking our submarines. They have the advantage of being operated from island bases which do not require the construction of airfields.

"The "Jake" for example, has a range of 781 nautical miles while carrying two bombs of 132 pounds each. Operating at a speed of 140 mph the plane will stay in the air about 6.4 hours. A larger depth charge would not materially cut down this range.

"Rufe", "Dave", "Pete", are other float planes used in this work which have similar performances.

"There is evidence to show that nearly 30 float planes of the Japanese "Eighth Fleet" operate each day from Rabaul, Kavieng and Mussau Island bases. There is additional evidence of at least six float planes each day operating from Truk on this type of work.

"The principal float plane anti-submarine bases are:-

<u>Southeast Area:</u>	Wewak, Rabaul, Kavieng, Mussau Island
<u>Truk Area:</u>	Truk, Ponape, Nomoi (Mortlock), Kapingamarangi (Greenwich), Woleai
<u>Palau Area:</u>	Arakabesan, Babelthuap
<u>Philippine Area:</u>	Cebu, Zamboanga, Davao
<u>Marshalls Area:</u>	<u>Principal Bases:</u> Kwajalein, Emidj (Jaluit), Tarawa
	<u>Minor Bases:</u> Eniwetok, Makin, Ebon, Taroa
<u>Marianas Area:</u>	Saipan, Guam (there is evidence of a daily search from Saipan with a radius of 250 miles).

"There is evidence of a new type of Japanese tactical organization using float planes in conjunction with motor torpedo boats similar in type to our P.T. boats. The main purpose of this new type of organization is to attack our shipping, but anti-submarine work is probably one of its duties.

"The following is an appreciation of recent aircraft and surface ship anti-submarine tactics employed by the Japanese.

### Vicinity of Palaus:

"The waters in this area are extremely clear and unusually calm. It is thought that a plane could sight a submarine at periscope depth.

"Planes and anti-submarine vessels work together. Surface vessels appear to coach planes to sound contacts. This means that when a submarine comes up to periscope depth the plane is overhead and the submarine is a good target for the aircraft.

"Planes are also effective in directing anti-submarine vessels to areas in which our submarines operate.

"One plane is reported to have dropped, in addition to bombs, a smoke float as a marker of the position of the submarine.

#### Vicinity of Marshalls:

"One of our submarines reports simultaneous aircraft bombing and surface ship depth charging. This is evidence of very close co-operation between aircraft and surface ships since the latter would be endangered by the bombs dropped from the aircraft.

"One submarine Captain believes that an attacking enemy aircraft homed on the submarine's search Radar since the bomb exploded just 2½ minutes after submarine had Radar contact with enemy aircraft at a distance of 6 miles.

#### Truk Area:

"One of our submarines reports air cover for Japanese convoys at night. Air cover at night is reported from within 60 and 70 miles distance from Truk.

#### Kavieng Area:

"Search planes are reported to be landing between 1855 and 1920 each night. Flares are used on dark nights. Searches start at morning twilight."

### SECTION V

## MISCELLANEOUS

### 1. ASDIC CONDITIONS IN S.W.P.A.

The following are extracts from the Monthly Report of an A.M.S.

"Again during this month the area east of Lady Elliot Island and south to Indian Head abounded in non-sub echoes from whales and schools of porpoises and blackfish.

"On the whole, long ranges of asdic detection have been obtained by the use of hand transmissions. Using chronoscope ranging, this ship had generally been able to keep station at night on the convoy at distances up to 5,000 yards.

Comment: The function of Asdic is to detect submarines, and therefore should be employed for station-keeping only in cases of emergency.

"Submarine exercises were conducted for U.S. submarines "STINGRAY" and "ALBACORE", both submarines carrying out approaches. Six submerged approaches were made, the submarines being detected at initial ranges of between 1,600 and 2,000 yards, although sea and swell were 43.

"On only one run was the periscope sighted and then at 400 yards. In one run in, while in contact at 700 yards, fairly loud hydrophone effect was heard. The submarine was later heard blowing her tanks."

There have been numerous occasions during exercises in which ships have gained initial contact on submerged submarines at ranges exceeding 2,500 yards and ships are invited to include information of this type in their Monthly Reports of Proceedings.

Sightings of periscopes during exercises of this type have not been frequent, and ships should take advantage of the "familiarisation" exercises to give lookouts practice in observing and reporting periscopes.

## 2. JAPANESE DESTROYER LOSSES

According to Japanese survivors who had been taken prisoner three destroyers were sunk in a night action in the Solomons area on August 6/7. These were "KAWAKAZE" (1370 tons, 34 knots, five-5" guns, eight torpedo tubes), "ARASHI" and "HARGIKAZE" (both 1500 tons, 34 knots, six-5" guns, eight torpedo tubes.) The prisoners thought another destroyer was also sunk.

## 3. HEAVY TOLL OF U-BOATS

Although losses of German, Italian and Japanese U-boats decreased slightly from the 45 sunk or probably sunk during July, August provided the best record of the war with 2.2 submarines sunk for every merchant ship lost. Twenty-nine U-boats are known sunk or probably sunk. Aircraft were responsible for 19 of the sinkings, surface craft for seven while three were sunk by ships and aircraft operating together.

Enemy submarines sank 13 ships totalling 86,325 gross tons while the total losses from all causes was 28 ships or 146,366 gross tons, a record minimum for the year.

The Japanese only had one success in all areas during the month, one ship having been sunk by their aircraft while in convoy off the north coast of Australia.

## 4. JAP AIRCRAFT CARRIERS

Reports indicate that the Japanese shipbuilding programme has given high priority to the construction of Aircraft Carriers.

Six carriers are known to have been sunk, but the Japanese have probably 10 more in commission. This figure includes auxiliary carriers.

## 5. JAPANESE SHIPPING LOSSES

Japan's merchant shipping losses since December, 1941, are estimated at 2,700,000 tons - more than 40 per cent of her pre-war tonnage. Shipping available at the outbreak of war was approximately 6,400,000 tons, and it is estimated that new construction, war prizes and salvage have produced about 1,300,000 tons.

Tonnage now available, excluding small craft, is probably 5,000,000 tons.

## 6. HONOURABLE HUSH HUSH

A member of the Naval Press Section (Kaigun Kodo Han In) attached to 'maru maru' Japanese submarine has sent in an account from 'maru maru' base of an attack on an enemy convoy as follows:-

"On 'maru maru' day of 'maru maru' month, the 'maru maru' submarine left its mother base in New Guinea. She was on the sea for over 'maru maru' months. Then on 'maru maru' day of August, at 'maru maru' minutes, 'maru maru' hour in the morning, an enemy convoy escorted by two destroyers was sighted.

"The attack began, and soon a direct hit was scored. Depth charges were dropped by enemy destroyers, but we were prepared."

'Maru maru' is apparently the Japanese equivalent of "hush hush".

## 7. JAPANESE SUBMARINES "SUCCESS"

The "sinking" of a cruiser of the "ACHILLES" type was described by Tokio Radio on September, 27.

"Quarters close to the Navy revealed that the enemy B class cruiser sent to the bottom on September 12 by our undersea craft, as announced by Imperial Headquarters, was an unidentified

cruiser of the "ACHILLES" type of the British Navy. Our submarine, cruising in waters off the New Hebrides, spotted an enemy convoy consisting of one cruiser, one destroyer, and one transport, in waters east of New Hebrides and forthwith attacked and sank the cruiser with several direct torpedo hits. They said that a thorough search in nearby waters, which was conducted for three hours, following the attack, confirmed the sinking of the enemy warship.

"They pointed out that this brilliant exploit is another manifestation of the effectiveness of our unremitting attacks on enemy supply lines. They said that in the ever intensifying war operations in the Solomons and New Guinea, the main objective of aircraft operations is to cut off the supply route. They pointed out therefore, that this submarine's action in waters so far south and deep in the rear of the enemy strikes the enemy supply route a heavy blow."

No ship was lost in this area during September.

#### 8. THE SUBMARINE WAR - GERMAN VERSION

We are indebted to Vice-Admiral Luetzow for the following comments on the U-boat war, made during a broadcast from Berlin. It is not difficult to detect a certain uneasiness in his tone, while his closing sentence contains a clear admission that the prosecution of the U-boat war is not going as smoothly as he would like. The graphs included in this Section indicate that the Allied successes have not, however, been "fleeing" as Vice-Admiral Luetzow would like to believe.

"Since the summer of 1940, we had watched the growing anxieties of our enemies as to how they should master the U-boat problem. They reinforced the protection of their convoys around England, especially in the North Sea, by extensive minefields, and in the Atlantic by allotting numerous escort vessels to the merchantmen and by the seizure of such neutral countries as Iceland and Greenland from whose bases their aircraft could then control wide stretches of the shipping routes from America to Great Britain.

"Germany replied by attacking with swarms of U-boats instead of with single submarines. The enemies attempted to

divert our forces by closing the ring around Europe from the east and the south and by the gradual repudiation of American neutrality. We replied by extending the range of activities of our submarines over the whole expanse of the Atlantic, and by organizing the hand-in-hand collaboration with Italy and Japan.

"We saw the gradual decline of the enemy's shipping space during the year 1942, but at the same time, the fighting conditions of our submarines became harder and more difficult. It was obvious the enemy tried every possible means to increase the security of his convoys and to evolve new means of resistance against our counter-measures.

"The first step was to double the ring of escort vessels around the convoys. The outer ring of destroyers had the task of forcing the submarines below water before they could establish the composition course and speed of the convoy. The inner ring of patrol boats was to dispose the actual attack.

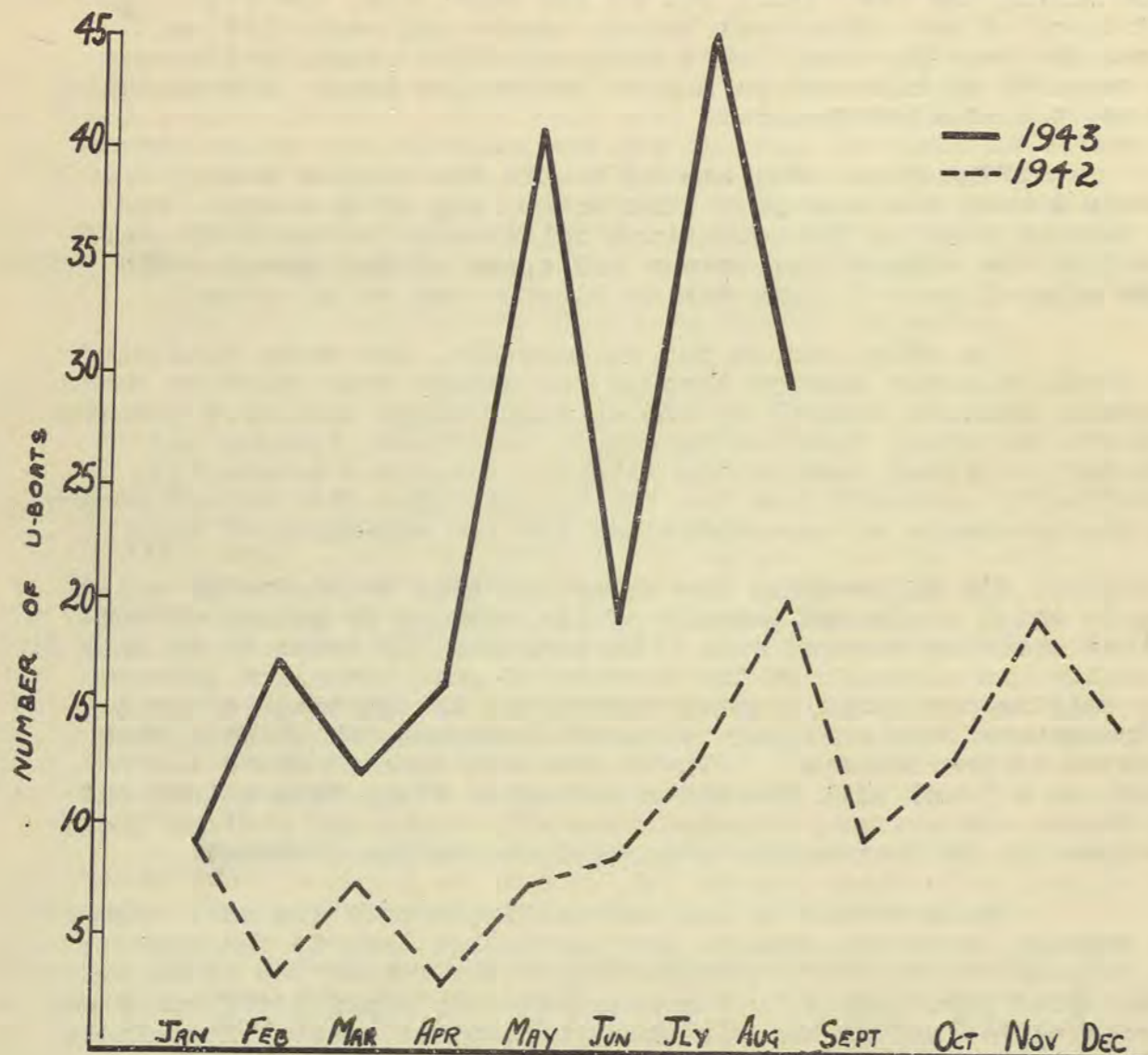
"As often and as far as possible, the enemy conducted his North Atlantic convoys through the waters over which he could maintain constant control by increasingly large numbers of powerful aircraft operating from Newfoundland, Greenland, Iceland and Ireland. A broad zone of the Atlantic Ocean was constantly patrolled by aircraft from the coast, which had the task of observing the movements of our submarines and the attacking of them.

"In this manner the enemy was able to limit the sea area in which a planned pursuit of his convoys by swarms of submarines could be carried out. In addition, in order to be able to employ his aircraft in the service of anti-submarine defence also outside the broad coastal forefield, he converted a number of freighters into auxiliary aircraft carriers, which were then allotted to the convoys. Their aircraft circled above the convoy on a level with the outer destroyer ring, kept a look out for German submarines, attacked them with bombs and radioed their presence to the destroyers to participate in the defence.

"As a result of the intensification of the anti-submarine defence, from the moment she leaves her base to the moment she returns to it, every undertaking of our submarines is an uninterrupted grim battle. She must begin by shaking off the enemy patrols at sea and in the air which infest the coastal fore-field and compel her to submerge and thus slow down her progress, or they challenge her to an artillery duel or attack her with bombs.

"If the submarines have safely passed this zone they are faced with the task of tracking down the enemy convoy with its destroyers and aircraft, a task which presents considerable difficulties for the submarines' High Command at home.

## SINKINGS OF U-BOATS - WORLDWIDE



The mounting toll of U-boats sunk and probably sunk is strikingly illustrated by this graph. The number destroyed during 1942 was only slightly more than the U-boat losses during the first six months of this year.

"The difficulty for the submarine is indicated by the fact that the field of view of the surface U-boats is eight times smaller than that of the escort of the enemy convoy with its destroyers and aircraft. As soon as the convoy is located, the outer defence ring must be evaded, diverted or penetrated and a favourable position gained for a frontal or flanking attack on the convoy.

"The more frequently the submarine is compelled to submerge and thus to travel at diminished speed, the greater are the chances of a convoy to sail past her unmolested. The submarine must then speed up again outside the range of view of the enemy escort in order to take up a new position of attack. On the return from her undertaking, the fight against the enemy patrols and the coastal fore-field must be repeated.

"The enemy is, however, fully aware that the present favourable moment may be a fleeting one."

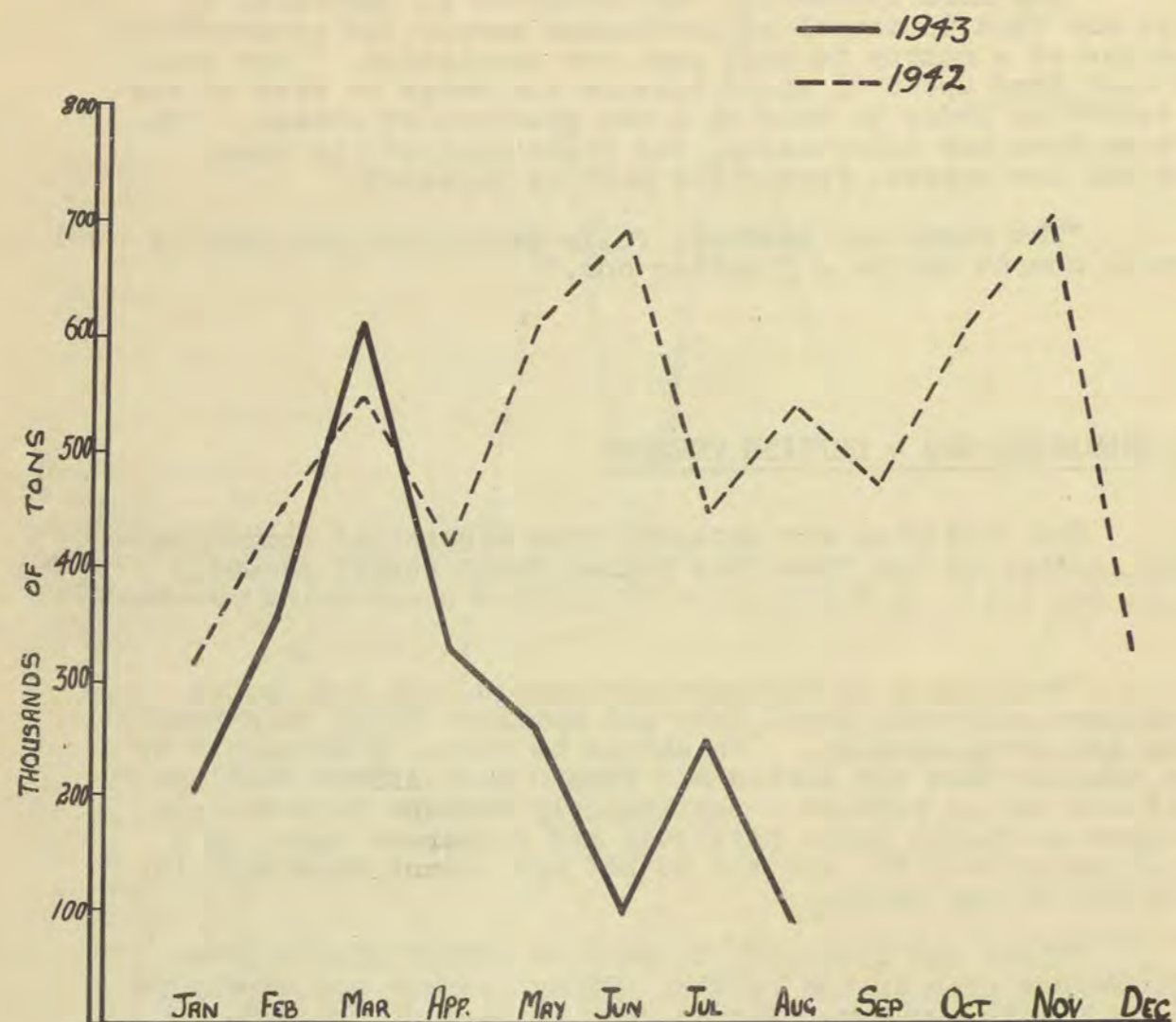
### 9. THE SUBMARINE WAR - BRITISH VERSION

The following are extracts from a personal communication from Admiral of the Fleet Sir Dudley Pound (until recently the First Sea Lord) to the Masters of British ocean-going merchant ships.

"Four years of war have now passed, and the losses which we have suffered, Royal Navy and Merchant Navy, have been grievous and irreplaceable. We should be fools, I think, if we did not realise that the stress and strain must affect each one of us in one way or another - particularly perhaps those who are called upon to fulfil their difficult and dangerous tasks as a matter of daily routine, and who do not and cannot know what is going on behind the scenes.

"First and foremost, it must be stated what a great part Air Forces play in the battle. They operate not merely in co-operation with our Naval Forces, but as part of the same tactical team. The Naval and Air Commanders concerned work in the same Headquarters ashore, using the same plots and information and playing their respective parts in ONE plan.

"This welding together of the Navy and Coastal Command reached from strategical decisions taken on the highest level

ALLIED SHIPPING LOSSES - WORLDWIDE

Although Allied shipping casualties rose sharply in March, there has been a marked decline in losses during 1943. Tonnage sunk during the first eight months of this year was approximately 50 per cent of that lost during the corresponding period of 1942.

down to the smallest details of drill and signalling between ship and aircraft.

"It requires constant training, organisation, operational and scientific research, experiment and analysis to ensure the effective combination of all our forces, both air and sea.

"What we really need in order to smash the U-boat campaign is an adequate number of Escort vessels, and very long range aircraft. Yet, if we put the whole of our shipbuilding capacity on to the production of Escort vessels, we should still never have sufficient to meet all our needs, and we should in the meanwhile be unable to replace our merchant ship losses.

"The principal object of the Navy, with R.A.F. Coastal Command, in Trade protection is to bring convoys and independent ships safely to port. Part of our strategy is, therefore, based on Evasive Routeing. By one means or another we acquire considerable knowledge of where U-boats are concentrating - a scrap of information, a D/F fix here, a sighting there, an attack somewhere else, like a jig-saw puzzle we fit the bits together so as to form a pattern. That pattern is watched, amended, studied, every day, every hour, every minute of the day and night.

"Once, however, a convoy has been sighted and reported, evasive routeing may no longer be sufficient. As soon as there is evidence that a convoy has been reported, all protecting forces are immediately warned - the Escorts with the convoy Naval Command on both sides of the Atlantic, and every Air Base from which long range aircraft might be sent. In other words, every protective force at our disposal is ordered to Battle Stations.

"In order that shipping should receive the maximum protection from the Air, it is nearly always our aim to route convoys and ships so as to get them under air cover as soon as possible.

"A careful analysis of the attacks on convoys has been made and all the evidence goes to show that the percentage losses of ships do NOT increase with the size of the convoy, but rather the reverse. In other words, there is reason to suppose, that, under a heavy attack, the losses in a convoy of 70 ships with an Escort of (say) 12 vessels are not likely to be as heavy as the losses in two convoys of 35 ships each with an Escort of 6 vessels.

"As a matter of interest, one reason for the statement that very large convoys are now deemed to be safer than small ones, is that the circumference of a 70 ship convoy is only 17 per cent greater than the circumference of a 35 ship convoy which the Escorts have to protect.

"The scale of our offensive counter-measures has been steadily growing. The number of U-boats sunk monthly has shown a slow but fairly steady increase since the outbreak of war. The rate of increase improved in the first months of this year and April was a record month. The month of May has seen April's record not only beaten but almost doubled. Such a rate of loss as has taken place in May, if it can be maintained, may well break the morale of the U-boat's crews, and there are already signs that the attacks are not being pressed home with the same daring as heretofore.

"Technical improvements to weapons and detecting devices in surface escorts are constantly being made, and are now beginning to pay an improved dividend. At a recent conference in Washington the whole aspect of the anti-U-boat war was discussed and steps taken to improve and standardise the methods of training the Escort Groups.

"The Admiralty regard it as the highest importance that a Group must be trained as a complete unit in order to secure the maximum efficiency, and as more Escorts become available so will a greater amount of time be set aside for Group training and operation.

"I do not wish to appear over optimistic but I am convinced that we have seen the worst and that the tide of victory is commencing to flow in our direction."

#### 10. M.L. HUNTING GROUPS

Fairmile M.L's have undertaken the protection of convoy routes off the North African coast. The routes all pass within 40 miles of the coast and conditions are suitable for Anti-submarine hunting and patrol work by Fairmiles.

Five M.L. hunting groups have been established, each group comprising five boats and maintaining constant patrol of three M.L's at sea. Individual boats thus spend two days in harbour and three at sea.

Although M.L's have not yet been credited with any U-boat sinkings, they have carried out seven hunts and have probably damaged two U-boats.



SECTION VIMATERIEL1. THE "SQUID"

An ahead throwing weapon firing much larger charges than either the Hedgehog or Mousetrap has been evolved by the Admiralty and is being fitted in R.N. ships. All forms of ahead throwing weapons have proved most successful against U-boats, but continued success will depend on all personnel maintaining a high degree of security in connection with the Squid, Hedgehog and Mousetrap.

In principle the Squid is a long range depth charge thrower designed to discharge bombs ahead of the attacking ship. A three barrelled mortar, the Squid is electrically fired and is automatically operated and controlled.

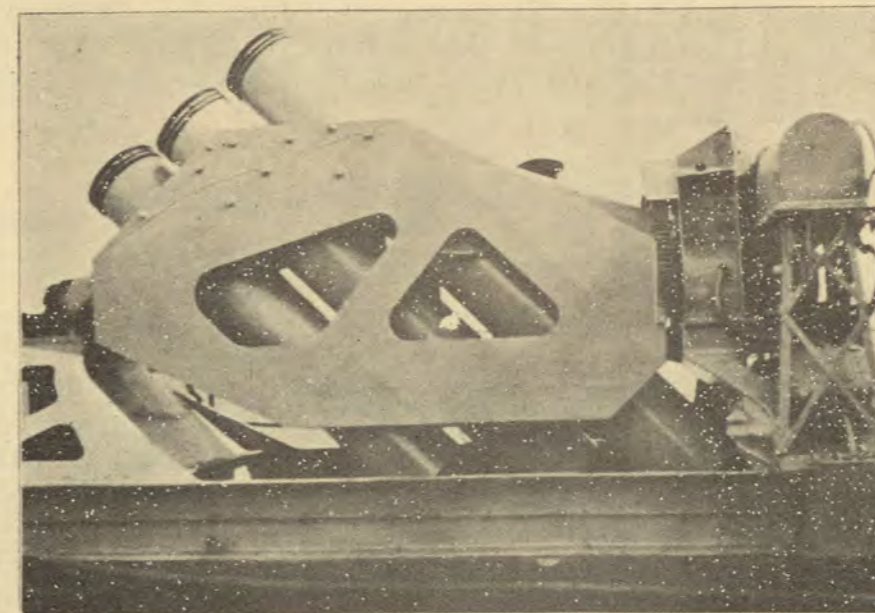
The bombs will resemble depth charges in weight and explosive effect, but have four distinct advantages over normal depth charges.

- (i) They will be projected with accuracy to a known point well ahead while the attacking ship is still in Asdic contact with the U-boat.
- (ii) They will have a reliable underwater course.
- (iii) They will have a much higher sinking speed.
- (iv) They will have a new type of fuse giving a high degree of accuracy in depth setting.

Depth will be set electrically from the depth prediction Asdic gear and the Squid will be fired automatically from the recorder. It is intended that the Squid should normally be used where depth charges are used now.

2. ECHO SOUNDING REPORTS

R.A.N. ships fitted with Echo Sounding sets are to render reports in accordance with A.F.O. 4155/42. Reports should

THE "SQUID"

The Starboard Squid mounting, photographed from inboard.



The method of loading the Squid, showing the mounting in the loading position.

be rendered to H.M.A.S. "RUSHCUTTER" copies to A.C.N.B. and O.C. H.B. In the case of commercial sets (e.g. Hughes, etc.) reports should be rendered quarterly at March 31, June 30, September 30, and December 31 and annually on September 30 in the case of Admiralty sets. Reports are required from individual ships only and not from flotillas.

### 3. H.T. CONNECTORS

When connector plugs in Type 134A sets are left in position in tubes, supporting, for long periods without removal they are apt to stick, particularly against the rubber plug. This has occurred in the tropics and the connector plugs have been damaged by the force required to remove them. It is considered that a fortnightly routine of removal for inspection and replacement should be carried out in all ships fitted with Type 134A equipment.

### 4. BATTERY BOXES

It has been found by Base Staffs that a layer of lime placed in the bottom of battery boxes prevents collection of moisture and assists in eliminating moisture difficulties, sweating and attendant troubles which are liable to occur under tropical conditions.

### 5. DEPTH CHARGE PATTERNS FOR FAIRMILES

The following depth charge drill as laid down in C.B. 4097(8) should be carried out by A/S boats of the Fairmile type.

A/S Boats fitted with Y Guns should use the four-charge pattern. Charges should be staggered for depth, the

first and last charges being set to the same depth (preferably the estimated depth of the U-boat). One of the thrown charges should be set shallower and the other deeper than this depth. (If it is possible, and time allows, the deepest setting should be applied to the charge which will be thrown in the direction in which the U-boat is moving).

A/S Boats not fitted with Y Guns should use a three-charge pattern, the centre charge being dropped from the chute at the time when the order "Fire Y gun" would have been given in Table A.

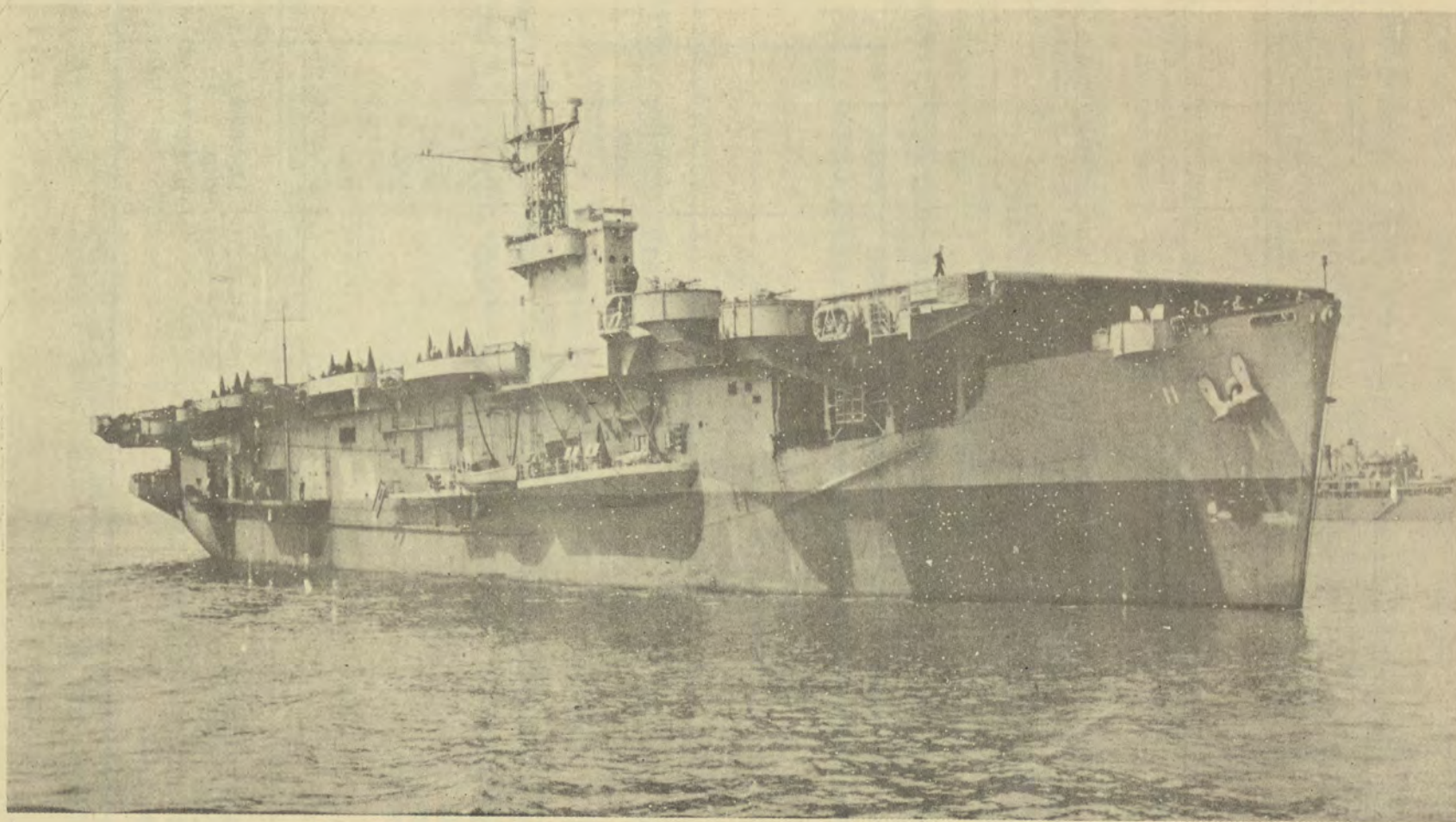
The first charge should be set shallower than the estimated depth of the U-boat, the second set to the estimated depth and the third set deeper than the estimated depth of the U-boat.

TABLE A

Instructions for Firing Three - or Four-charge Patterns.

Give order "Fire" when:- Recorder shows (a), or distance from 1st charge is (b), or time from 1st charge is (c) at 14 knots, or (d) at 10 knots.	Order	Chute	Y Gun
(a) Fire 1st Charge (b) (c) (d)	"Fire First"	Release one Charge	-
(a) Fire throwers (b) 60 yards (c) 7.7 seconds (d) 10.7 seconds	"Fire Y Gun"	If not fitted with Y gun - Release one Charge	Fire Y Gun
(a) Fire last charge (b) 120 yards (c) 15.4 seconds (d) 21.4 seconds	"Fire Last"	Release one Charge	-

ESCORT CARRIER



A typical escort carrier. Aircraft from these ships have proved very successful in destroying U-boats which previously had been able to take advantage of the mid-Atlantic "gap" in air cover.

SECRET

- 42 -

A.C.B. 0233/43 (5)

TABLE B

## Recommended Depth Settings for A/S Boats

Reference Letter	A	B	C	D	E	F	
Not to be dropped when depth of water is less than	8 ftms.	25 ftms.	42 ftms.	60 ftms.	84 ftms.	84 ftms.	
First and last charge	Ft. 50	Ft. 100	Ft. 150	Ft. 250	Ft. 350	Ft. 500	
Y gun	Starboard	50	50	100	150	250	350
	Port	50	150	250	350	500	500
Recorder mean depth setting	50	100	150	250	350	500	

If no Y gun is fitted.

First Charge	50	50	100	150	250	350
Centre Charge	50	100	150	250	350	500
Last Charge	50	150	250	350	500	500

Secondary Method of obtaining the time to fire.

Should the recorder not be available, it is possible to carry out an attack of less accuracy by measuring the range by chronoscope, or by estimations at half transmission intervals using the automatic transmission unit, and timing the run in by stop-watch. The following tables have been constructed to show the time interval before firing the First depth-charge in a pattern for different classes of boat.

Oscillator to Mean Depth-Charge Position - 25 yards.  
Attack Speed - 16 knots.

Asdic Range	Depth Charge Setting	Submarine's Inclination		
		Opening	90°	Closing
Yards		Secs.	Secs.	Secs.
500	Shallow	67	52	40
	Deep	71	52	38
250	Shallow	33	23	17
	Deep	36	23	15

## 6. DEPTH CHARGES

Inquiries have been made by several R.A.N. ships as to the correct "time to fire" procedure in view of the introduction of 60 yard spacing between charges and the introduction of attacks in "Scale 25". The position has been further complicated by the introduction of ahead-throwing weapons, necessitating a revision of the "oscillator to stern" allowance to provide for hedgehog charges being thrown ahead of the attacking ship.

The following summary is an explanation of C.A.F.O.'s dealing with depth charge firing.

1. C.A.F.O. 2021/42 and Diagram 141/42 as amended by C.A.F.O. 2183/42 and Diagram 164/42. Introduced pointer and paper scale for firing patterns in Scale 25. It was found that the paper scale was unsatisfactory because it was not durable, and the pointers and paper scales have been replaced by a modified Depth Charge plate (C.A.F.O. 1381/43). Ships should retain the paper scales and pointers until the new plate is manufactured and supplied.

2. C.A.F.O. 127/43 and Diagram 11A/43

Provided for a new cam to give 60 yard spacing between charges. All attacks are to be made in Scale 25. Paragraphs 7 to 13 inclusive are cancelled by C.A.F.O. 1381/43.

3. C.A.F.O. 729/43 and Diagram 58/43

This C.A.F.O. is cancelled by 1381/43. It was found that the new D.C. plates would fit recorders A/S 3B, A/S 3C etc. (which provide for ahead throwing weapons) but not Recorders A/S 3.

4. C.A.F.O. 934/43

Cancelled by 1381/43.

5. C.A.F.O. 1381/43 as amplified by C.A.F.O. 1436/43 and C.A.F.O. 1437/43.

Cancel 2021/42, 2183/42, 729/43, 934/43 and paragraphs 7 to 13 inclusive of 127/43.

Introduces a new range scale, Depth Charge and Ahead Throwing Weapon Plates. As these plates are not yet available on this Station, ships should retain the pointers and paper scales. C.A.F.O.'s 2021/42 and 2183/42 will not be cancelled on this station until the new plates become available.

R.A.N. ships have been modified up to and including C.A.F.O. 127/43.

On all occasions of carrying out depth charge attacks the time to fire the FIRST charge is to be obtained from the Recorder in SCALE 25 in the normal manner. The cam should NOT be used for firing the throwers, because correct positioning of the pattern would not be attained if the throwers were fired at the same time as the first charge from the rails.

This applies whether the Recorder has been fitted with the 60 yard cam or not.

The remaining charges are to be fired by stop-watch as laid down by C.A.F.O. 1381/43.

Provided for a new can to give 50  
 yard spacing between charges. All  
 attacks are to be made in Scale 25.  
 cancelled by O.A.P. 1381A3.

This O.A.P. is cancelled by 1381A3.  
 It is found that the new D.O. plates  
 would fit receivers A/B 38, A/B 39  
 etc. (which provide for short throw  
 the receiver) but not receivers A/B 2,  
 cancelled by 1381A3.

O.A.P. 1381A3 is cancelled by 1381A3.  
 It is found that the new D.O. plates  
 would fit receivers A/B 38, A/B 39  
 etc. (which provide for short throw  
 the receiver) but not receivers A/B 2,  
 cancelled by 1381A3.

O.A.P. 1381A3 is cancelled by 1381A3.  
 It is found that the new D.O. plates  
 would fit receivers A/B 38, A/B 39  
 etc. (which provide for short throw  
 the receiver) but not receivers A/B 2,  
 cancelled by 1381A3.

O.A.P. 1381A3 is cancelled by 1381A3.  
 It is found that the new D.O. plates  
 would fit receivers A/B 38, A/B 39  
 etc. (which provide for short throw  
 the receiver) but not receivers A/B 2,  
 cancelled by 1381A3.

O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3

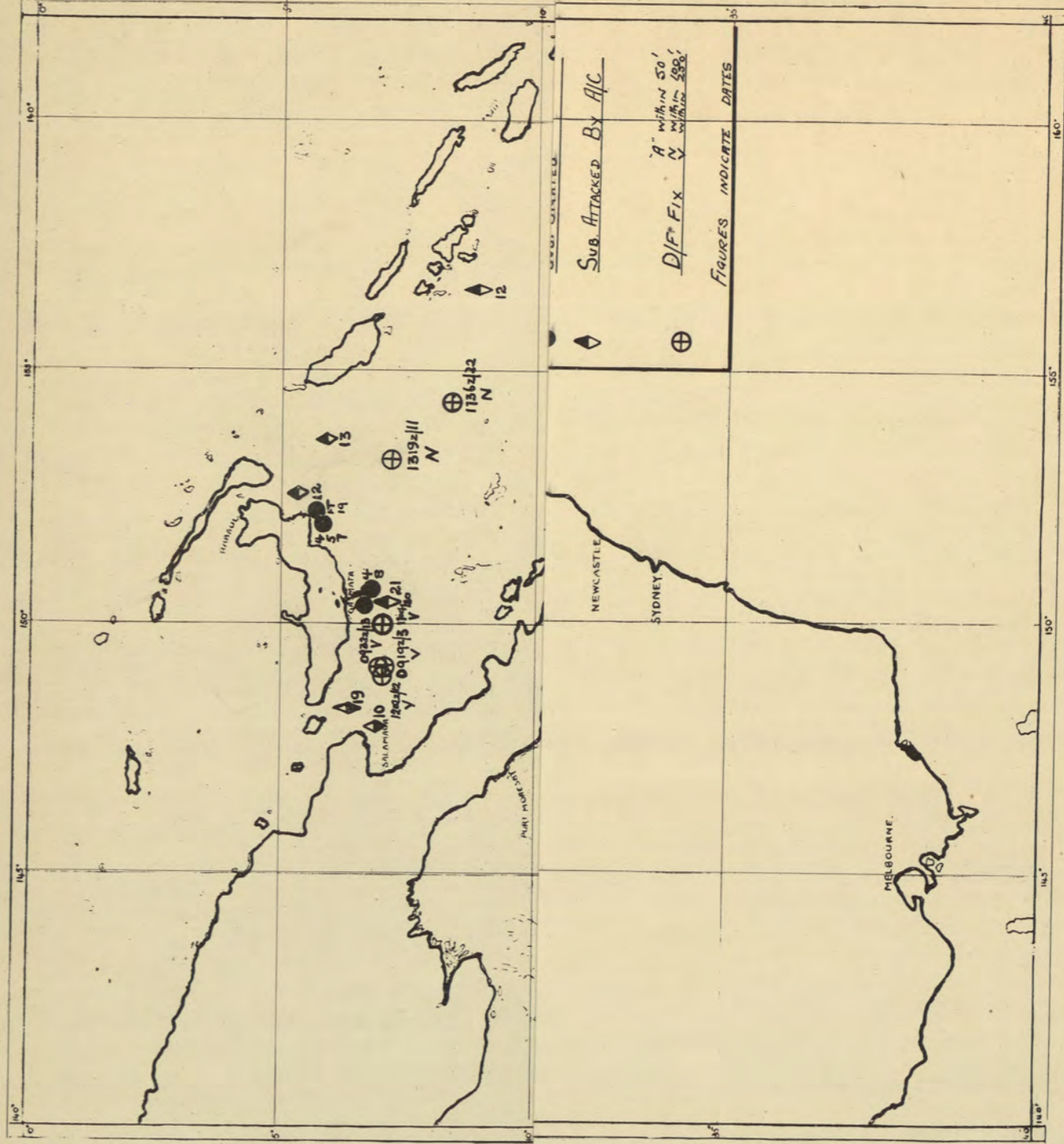
O.A.P. 1381A3 and  
 Diagram 1381A3

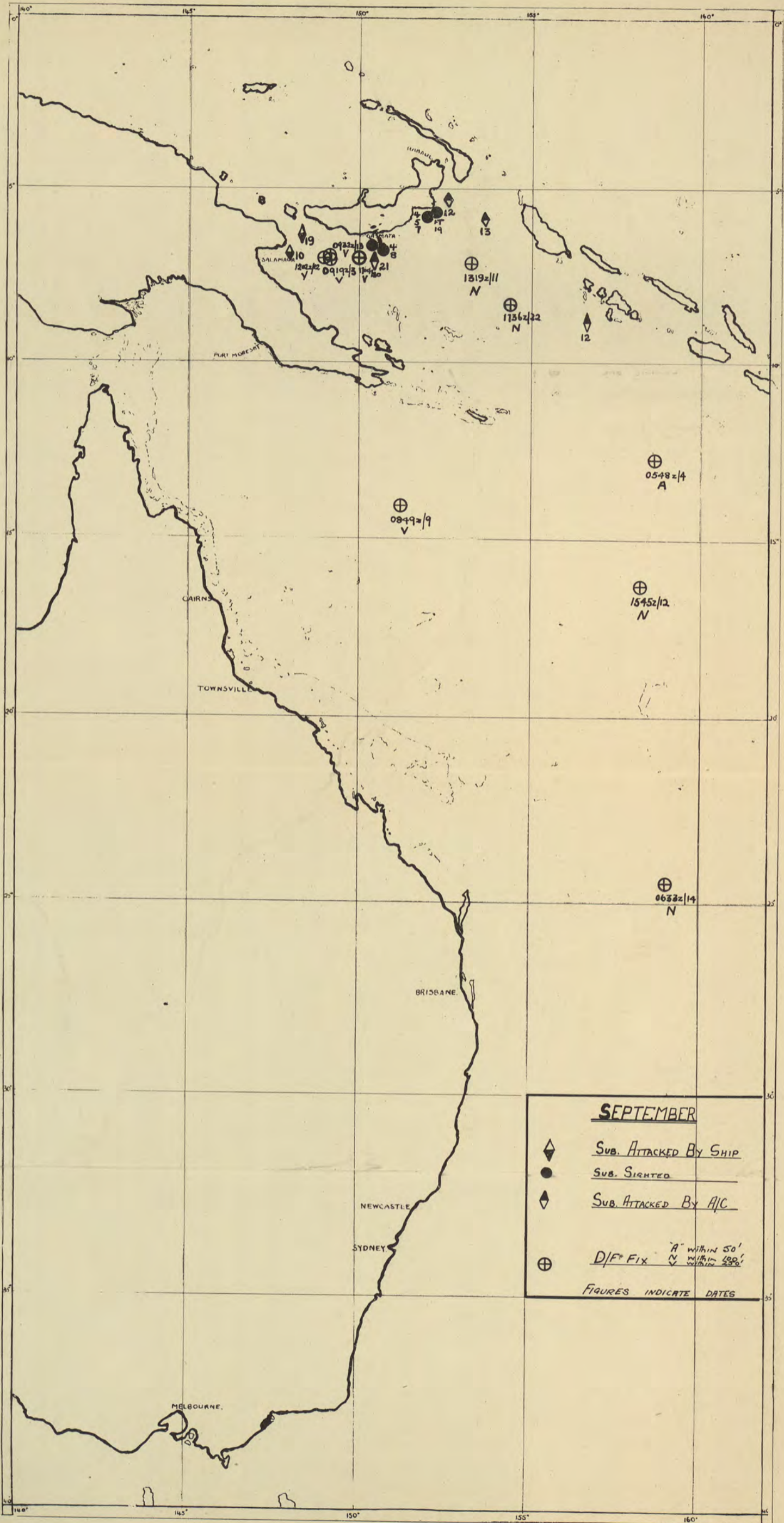
O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3

O.A.P. 1381A3 and  
 Diagram 1381A3





**SEPTMBER**

- ◊ SUB. ATTACKED BY SHIP
  - SUB. SIGHTED
  - ◊ SUB. ATTACKED BY A/C
  - ⊕ D/F FIX
    - A" within 50'
    - N within 100'
    - V within 250'
- FIGURES INDICATE DATES

⊕ 0548z/4  
A

⊕ 0849z/9  
V

⊕ 1545z/12  
N

⊕ 0633z/14  
N

⊕ 1319z/11  
N

⊕ 1736z/22  
N

⊕ 0922z/10  
V

⊕ 0919z/13  
V

⊕ 1141z/21  
V

⊕ 1202z/22  
V

⊕ 1457z/19  
T

⊕ 1512z/12  
N

⊕ 1519z/13  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

⊕ 1500z/12  
N

