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A.C.B. 0233/43 (6)

SOUTH-WEST PACIFIC

ANTI-SUBMARINE REPORT

NOVEMBER, 1943

File reclassified as:

OPEN

2/3/05

S E C R E T

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ANTI - SUBMARINE REPORT

NOVEMBER, 1943.

ANTI-SUBMARINE
WARFARE DIVISION,
NAVY OFFICE,
MELBOURNE.

C13223

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Japanese Submarine Activity -
Map for October

Appendix I

SECTION ICOUNTER MEASURES1. REVIEW FOR OCTOBER

Japanese submarine activity was again centred in the area bounded by the Woodlark Islands, the north eastern coast of New Guinea and the south coast of New Britain. Indications towards the end of September that one submarine was moving southwards were borne out by an attack on convoy GP 72 twenty miles east of Sandy Cape on October 7. No ship was hit but a torpedo was sighted and H.M.A.S. "GLENELG" carried out an energetic attack dropping 37 charges. The attack has been assessed "submarine present, insufficient evidence of damage".

Although enemy submarines are known by sighting or D/F fix to have been operating in the New Guinea area on at least 15 days during October only 3 attacks were reported in the vicinity.

The U.S. destroyer "HENLEY" was sunk by torpedo 30 miles from Morobe on October 3 and six days later the S.S. "MOA MOA" reported that three torpedoes had been fired at her in position 7° 40' S 148° E. Another unsuccessful attack was made on Allied shipping off Finschhafen on October 21.

At 1135L on October 19 the U.S. submarine "PETO" reported that two torpedoes had been fired at her by an enemy submarine in position 21° 30' S 157° 56' E. Both torpedoes missed.

Attacks on enemy submarines, however, were more successful. U.S. destroyers claimed "kills" off Guadalcanal on October 1 and off Kolombangra on the night of October 2/3. The submarine which sank "HENLEY" was also claimed as possibly sunk and B 24's on offensive patrol scored one direct hit and a near miss on two other submarines. None of these attacks has received assessment.

Allied raids on Rabaul severely damaged one U-boat on October 12, photographs three days later revealing a damaged submarine still in harbour. Two U.S. aircraft attacked a surfaced submarine off the Woodlark Islands at 1008L on October 29 scoring two near misses with 500 pound bombs while earlier in the month an R.A.A.F. Beaufort had attacked a surfaced U-boat in almost the same position.

During the evening of October 18 a B 24 on reconnaissance over Kusaie, the eastern most island of the Caroline Group, reported a near miss on an enemy submarine. One of the Japanese crew was washed overboard by the explosion.

2. ACOUSTIC TORPEDO PROTECTION

FXR gear, which consists of a noise source towed astern of the escort vessel at a suitable distance and depth, is designed to protect escort vessels against acoustic torpedoes.

The parallel bar noise source is towed 500 feet astern of the escort and may be streamed at any speed up to 20 knots. However, at speeds below 10 knots the gear may foul the bottom in depths less than 25 fathoms.

The sound produced by the gear is considerably louder than the noise of the ship and is quite characteristic. It can be detected and identified by Asdic, but does not interfere with normal Asdic operations forward of the beam.

There is a fairly high background noise when the oscillator is trained on the bearing abaft the beam, and this may obscure weak echoes. Tests carried out to date however, indicate that the only interference to be expected by the towing ship will be when the gear is not dead astern.

The gear is very simple and the possibility of local manufacture is being investigated.

3. ANTI-TORPEDO DEVICES FOR MERCHANT SHIPS

Certain United States merchant ships are now fitted with Anti-torpedo devices known as Anti-torpedo device Mark 29.

The gear comprises a warning hydrophone towed astern and a paravane towed from the bow on each side of the ship. The towing wire is 305 feet in length and from it five streamers are streamed parallel to the ship. These streamers, reading from outboard, are (1) Detector streamer, (2) Explosive streamer, (3) Explosive streamer 100 feet from ship's side, (4) Short stabilizing streamer and (5) Short stabilizing streamer.

Subject to certain safety restrictions being fulfilled, an operator in the ship's control room arms the device when obtaining warning of approach of a torpedo on the hydrophone circuit.

When the explosive streamers have been armed the detector streamer will automatically fire the first explosive streamer just as the torpedo passes under it thus damaging or detonating the torpedo at a safe distance from the ship.

Limitations are:

(a) When armed, the device may be fired on receipt of sounds which are not from torpedoes.

(b) Firing of the first steamer may damage the ship sufficiently to put main machinery out of action particularly if P.V's are not keeping the streamers at the correct distance from the ship i.e. if course is altered.

The ship must reduce below convoy speed to stream and recover gear and this may take up to 4 hours, depending on efficiency of crew.

4. USE OF ASDIC FOR SELF PROTECTION

An Asdic sweep used for self protection is primarily intended to detect a submerged submarine before she has run in so close that the ship attacked has insufficient time to avoid completely any torpedo that may be fired.

Normally the submerged submarine will not be able to travel as fast as the surface craft, and its ability to close the latter is therefore limited. If the Asdic beam covers bearings forward of the beam it is not generally possible for a submerged submarine to escape detection by this sweep and at the same time approach within the range of echo detection on bearings abaft the sweep.

In the following experiments, carried out at H.M. Experimental Establishment, Fairlie, 70° - 70° and 80° - 80° sweeps were considered, and the nearest distance to which a five knot submarine could approach an 18 knot ship on bearings aft of these sweeps was found to be as follows:-

Arc of sweep

80 - 80

Range of nearest approach

.9 E, where E is range of echo detection.

70 - 70

.81 E, where E is range of echo detection.

If E is 2,500 yards, the ranges in the cases above will be 2,250 yards for an 80-80 sweep and 2,020 in the case of a 70-70 sweep.

5. EFFECT OF GUNFIRE ON U-BOATS

Generally speaking, a U-boat will survive an attack by gunfire unless the pressure hull is penetrated. Experience shows that at ranges of less than 3,000 yards a 4-in S.A.P. projectile is likely to be deflected by the pressure hull on account of the angle at which it strikes. At longer ranges the chance of hitting is less, but penetration of the pressure hull is more likely if a hit is scored.

One of the recent Admiralty publications on "Fighting Experiences" recommends that when engaging a submarine target with gunfire destroyers and escort vessels should use H.E. projectiles at lesser ranges than 5,000 yards. At greater ranges S.A.P. should be used.

Short range weapons are unlikely to inflict serious damage to a U-boat. When encountered at short range, however, there is a possibility that the Commanding Officer and key personnel may be on the conning tower. The fire of short range weapons should therefore be directed at this target.

The disappearance of a U-boat after being attacked by gunfire is no evidence that the U-boat has been destroyed.

6. THE TWO-INCH ROCKET FLARE

To avoid the necessity for firing starshell from main armament guns and to make it possible to keep the target illuminated by ships when only one gun will bear, 2-inch flare projectors are to be fitted to R.A.N. escort vessels.

The projector consists of two sets of angle iron framework, a set being attached on either side of the gun shield at an elevation of 30°. Each framework contains rails for three rockets and the rails are spread in pairs, two in line with the gun, two 6° to the left and two 6° to the right.

In rear of the rails is a flame guard to protect the gun's crew from the effect of the flame which comes from the tail of the rocket on firing.

The rockets are fired by means of electric pushes inside the gun shield, one firing push being provided for each pair of rails. A starshell spirit level is fitted at the firing position to ensure the flares are fired with the ship horizontal.

The round itself consists of three parts - the flare head, the propelling unit, and four fins. These components are supplied separately, the round being assembled on board. The projectile is 51" long and 2½" diameter and weighs 12¼ pounds.

The round leaves the projector about 1/10th of a second after firing, but combustion of the cordite continues for a further 1.2 seconds. The flare is ejected at a range of approximately 5,000 yards and burns for 70 seconds. The flare begins to burn about 25 seconds after firing.

The flare head container is a tinned plate cylinder with two cannellures near the base. The canister, housing an illuminating candle with a parachute assembly attached, is inserted in the container. 22 seconds after firing the primary ejection charge is ignited and the canister is thrown from the container in a forward direction.

Three seconds later the secondary ejection charge is ignited and this ejects the parachute cable and candle in a forward direction, its flash igniting the candle at the same time. The parachute opens and the lighted candle is suspended in mid-air, where it burns for 70 seconds.

7. THE IMPORTANCE OF TRAINING

The following extract from a recent Admiralty Monthly A/S Report stresses the results which can be achieved by well trained, fully efficient anti-submarine craft. Every effort must be made that the lessons learnt during the Battle of the Atlantic be applied to our training in the South West Pacific Area.

"The U-boat is being hit and hit hard whenever an aircraft attacks her on the surface in the Atlantic; whenever a group of three or more ships can obtain contact with a submerged U-boat and have time to hunt her, her destruction is pretty well assured. The U-boat's life has indeed become precarious. There are a still few "soft spots" where the enemy can sink a small proportion of the shipping passing through an area without being unduly worried by the accuracy of attacks by aircraft or surface forces, but in Western Approaches Command, in the Fleet and in Coastal Command in particular the emphasis on anti-submarine training has clearly borne much good fruit. Elsewhere there are difficulties in fitting, in training owing to shortages and the lack of training submarines. The need is great, and opportunities must be made, even if some operational commitments are not fully satisfied.

"A FEW FULLY EFFICIENT ANTI-SUBMARINE CRAFT ARE WORTH A LARGE NUMBER OF "FIFTY-PERCENTERS"."

SECTION IIENEMY ACTIVITY1. JAPANESE SUBMARINE ACTIVITY - MAP FOR OCTOBER.

See Appendix I at back of this Report.

2. 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	-	-	-	-	-
OCTOBER	3	-	-	-	-
TOTAL	28	11	49,941	4	26,230

3. ANALYSIS OF CONVOYS - SEPTEMBER, OCTOBER

AREA	No. of Ships		Tonnage	
	September	October	September	October
Thursday Is. - Darwin	15	4	39,139	10,488
Barrier Reef - Brisbane	91	102	406,224	464,273
Brisbane - Sydney	59	73	214,264	252,137
Newcastle - Melbourne	128	148	492,441	566,676
Coral Sea	187	260	954,767	1,426,714
Arafura Sea	8	13	18,984	35,309
TOTAL	488	600	2,125,819	2,755,597

SECTION IIINARRATIVES1. A RADAR - ASDIC ATTACK IN THE PACIFIC

The U.S. destroyer "ELLET" carried out a model attack on a Japanese U-boat west of Torres Island on the night of September 3, after the submarine had been detected on the surface at 13,000 yards by SG type Radar.

"ELLET" altered course and closed the range at 20 knots. At 5,000 yards the minor war vessel challenge was made because the Commanding Officer considered that the Radar contact might be a small friendly vessel as it was on a main convoy route. No reply was received and "ELLET" fired star shell at 2005 just as the Radar operator reported that the contact had disappeared. Range was then 3,400 yards and star shell failed to illuminate any target.

The last Radar bearing was 239° and course was altered and speed reduced to 15 knots to begin the Asdic search. Less than a minute later Asdic contact was reported bearing 240°, range 3,000 yards, and lookouts could smell diesel fumes.

The submarine's course was now estimated as north-west, and shortly after "ELLET" altered course to steer for the target the Asdic operator reported the bearing drawing rapidly left. Course was altered 20° to port and a nine charge pattern set deep was fired at 2012 -- seven minutes after the submarine had dived.

At 2016 contact was regained and four minutes later two charges were dropped. At 2031 the target was regained at 1,300 yards and was observed to be drawing right. The destroyer went hard to starboard and then began to close the submarine on a steady bearing, the recorder showing a range rate of 12 knots and the wake effect on the trace confirming that the submarine was moving away.

Another nine charge pattern was dropped and about 90 seconds after the depth charge explosions a single detonation was heard. This explosion was similar to a deep depth charge, but although there was a sharp crack and the water began to "boil" there was no plume.

Two minutes after this attack contact was regained at 1,200 yards. Depth charges on deck had all been expended and "ELLET" decreased speed to 10 and then to five knots to facilitate reloading of racks and throwers.

The submarine was reported to be stopped and at a range of about 175 yards contact was lost. The Commanding Officer believed that the submarine sank at this point. Depth of water was about 1,350 fathoms.

Contact could not be regained, but at 0445 next morning diesel oil was observed about two and a half miles down wind from the last attack. At 0727 a large diesel oil slick was observed measuring 700 yards wide and extending for about five miles. Large oil bubbles six to ten feet in diameter were rising from a stationary position, despite considerable wind, and there were several small pieces of debris, one a dark brown piece two feet by three feet resembling a piece of matting or cloth.

No SMSD (ship's magnetic submarine detector) contact could be obtained, but when two other destroyers arrived to join the search that afternoon large oil bubbles were still rising from the same position. The three destroyers searched by Asdic an area 90 square miles around the position of the attack, leaving the area at 0500 on September 5 without making further contact.

2. ENEMY SUBMARINE SIGHTED

A Japanese submarine, which appeared to be about 300 feet long, was sighted by the crew of a B 24 on October 22. The aircraft, which was flying from Fiji to Amberley, carried no bombs or ammunition.

At 0235z, in position 23° 57' S, 162° 10' E, the pilot saw a V-shaped wake bearing Red 80, distant 10 miles. As the plane altered course and approached the wake appeared to zig-zag and a submarine surfaced.

The U-boat was closely watched through binoculars for some minutes. The conning tower was very large -- much larger than either U.S. or German types.

Other features of the sighting were

(a) the rapid alteration of course by the submarine in taking avoiding action (two complete circles turning to port.)

(b) the foredeck was awash while the after deck was clear of the water.

(c) very little wake was noticed while the submarine was surfaced.

3. U-BOAT VERSUS U-BOAT

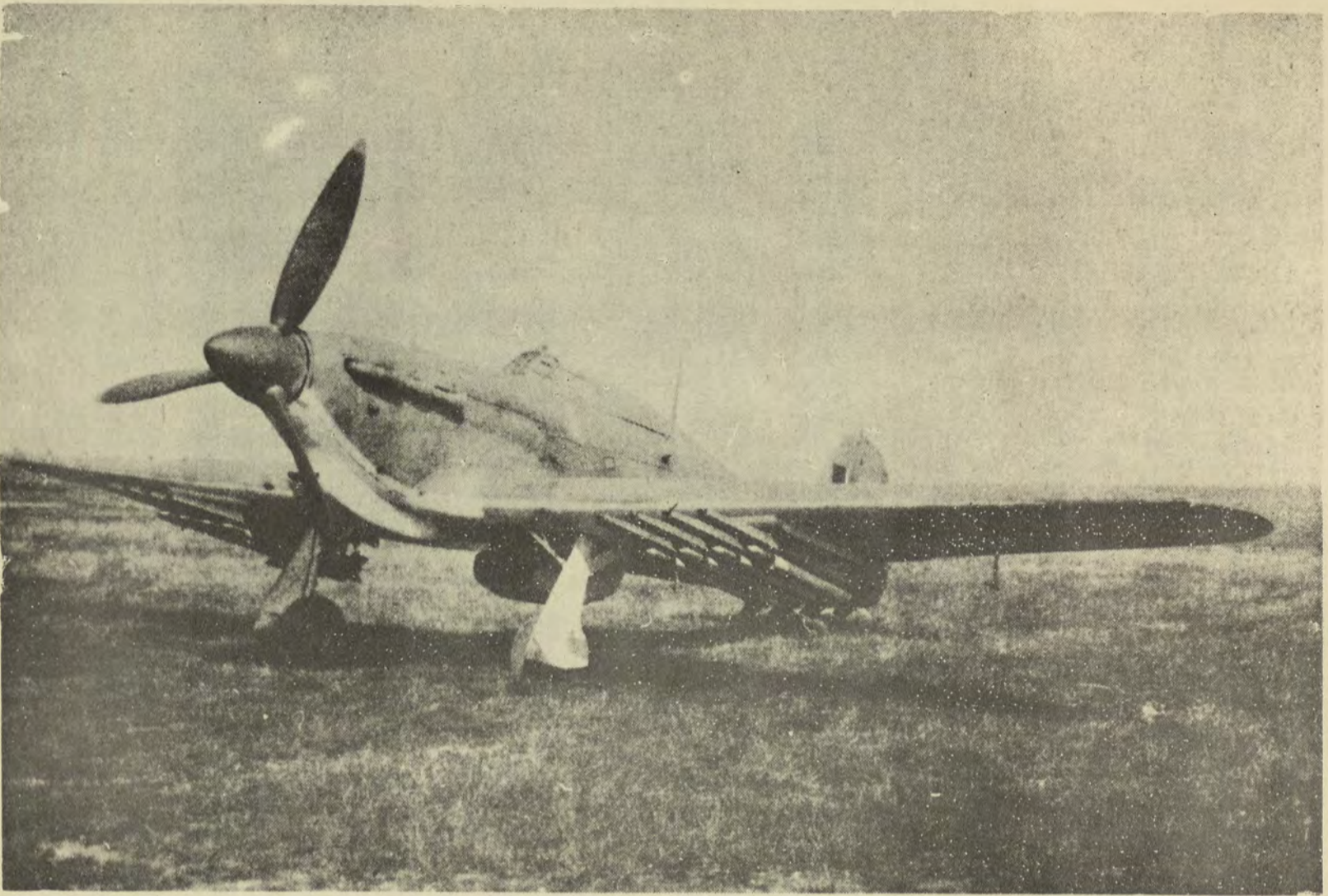
A Japanese "I" class submarine was sunk after a short torpedo duel with the U.S. submarine "SCAMP" on July 27 in the south west Pacific.

The U.S. submarine was on patrol north of New Britain when the asdic operator reported hydrophone effect. "SCAMP" came to periscope depth and observed a large Japanese submarine on the surface, but while she was manoeuvring to an attacking position the Asdic operator reported that the enemy U-boat had fired a torpedo.

"SCAMP" immediately went full ahead and dived deep, the torpedo passing over the stern. As the torpedo passed the U.S. submarine trimmed off and came to periscope depth to attack. The Commanding Officer, looking through the periscope, could clearly see the Japanese ensign painted on the conning tower of the enemy submarine. The Japanese U-boat passed astern and four torpedoes were fired at it as it went by.

One of the torpedoes was heard to hit the submarine, and when "SCAMP's" Commanding Officer raised the periscope again he saw brown smoke but no sign of the target. Hydrophone effect from the Japanese submarine's propellers ceased immediately after the explosion and a large oil slick appeared on the surface. Five detonations followed, and then crackling noises could be heard.

The attack has been assessed "Known Sunk".



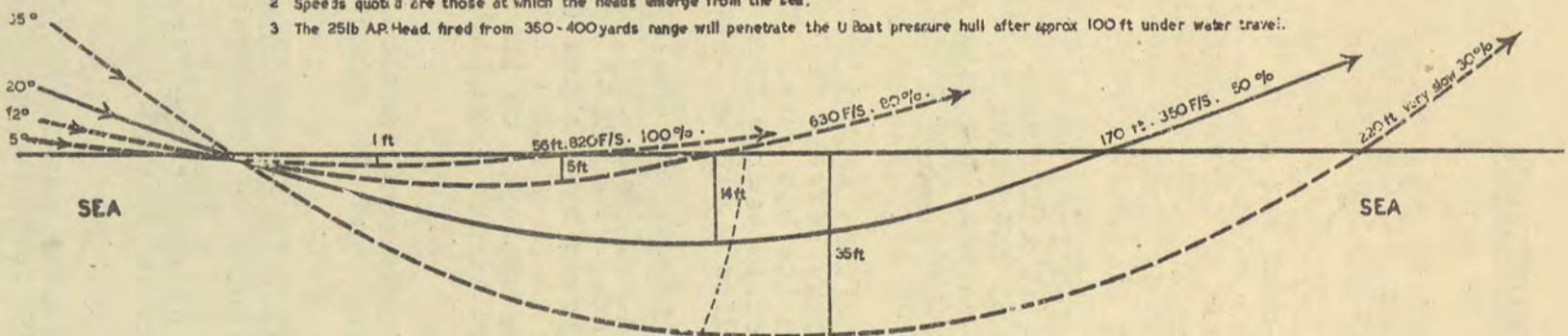
A Hurricane fitted with eight rocket projectiles. The R.P's can be seen underneath the wings.

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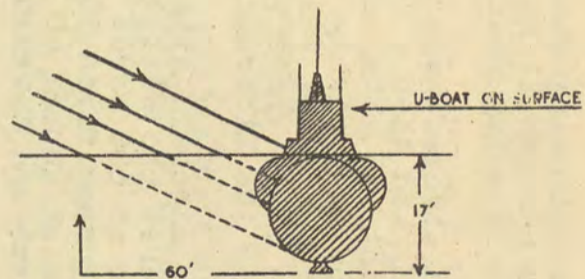
R.P's fitted with 25 lb. A.P. Head.

Underwater Trajectory of R.Ps fired into the sea at different angles of dive based on information of 22 .. 3 .. 43.

- NOTE 1. Percentages given are the proportion of heads which behave in the manner shown.
 2. Speeds quoted are those at which the heads emerge from the sea.
 3. The 25 lb AP Head, fired from 350-400 yards range will penetrate the U Boat pressure hull after approx 100 ft under water travel.



100' LETHAL LIMIT OF 25 LB HEAD UNDER WATER



4 R.Ps fired simultaneously in a SPACED SALVO in a 20° DIVE

4. AN ATTACK WITH ROCKET PROJECTILES

The following attack by an R.A.F. Liberator aircraft is interesting because it is one of the first successful attacks by an aircraft using rocket projectiles.

The aircraft was patrolling at 6,600 feet when a wake was sighted, and then a U-boat was seen, distant eight miles. Radar contact was obtained almost immediately after the sighting, the delay being probably due to interference from a number of contacts from fishing vessels. The submarine was steaming on the surface at 12 knots but it took no evasive action and did not open fire as the Liberator circled to port losing height.

The aircraft attacked from Green 110, firing the first pair of rocket projectiles at a distance of 800 yards, the second pair at 600 yards and the salvo of four R.P.'s at 500 yards. The front gunner fired 30 rounds, the rear gunner 200 rounds and the port waist gunner 60 rounds, hits being obtained on the conning tower and forward of it.

Splashes of entry of the rocket projectiles were seen slightly abaft a point midway between the conning tower and bow, and between the U-boat and its bow wave. The rear gunner observed one rocket projectile emerge from the sea beyond the U-boat which was seen to dive a minute later.

Six torpede depth charges set shallow and spaced 54 feet apart were then released and photographs showed that they straddled the U-boat's track. Two white depth charge plumes were sighted, closely followed by a black plume which was larger than the others. Fifteen to 20 minutes later some air bubbles vapour and wooden wreckage appeared on the surface, and these were still visible when an escort group, which had been homed by the aircraft, arrived.

One of the most important factors in sinking U-boats is promptitude in attacking, and the rocket projectile lends itself to this.

The rocket projectiles are of three types, (a) a 60lb head containing high explosive or incendiary, (b) a solid 25lb armour piercing head and (c) a flare. A hit on the pressure hull of a submarine with either of the first two types is likely to cause a hole sufficient to prevent a surfaced U-boat from diving.

The striking velocity necessary to perforate the pressure hull is about 600 feet per second, and this velocity

may be expected of the R.P. even after it has passed through 70 feet of water if fired at a range of about 400 yards.

When fired the rocket projectile accelerates for one and a half seconds. By this time it has reached its maximum speed of approximately 1,800 feet per second and has travelled between 600 and 700 yards. It might therefore be presumed that for best penetration R.P.'s should be fired at 600-700 yards range, but this is not the case. By the time the projectile has travelled 700 yards the tube is red hot and will normally break away from the rocket head on entering the sea. The tube has not reached a very high temperature after 400 yards, and the head will therefore not break off when the R.P. strikes the water.

The rocket head has no useful underwater trajectory, but relies on the steel tube of the rocket motor to give it the remarkable underwater travel it possesses.

Striking the water at an angle of 20° the rocket projectile will travel submerged for a distance of some 60 yards and will then surface, reaching a depth of 13 to 15 feet during its underwater passage. It will be seen that "shorts" may prove effective in perforating the pressure hull of a U-boat on or near the surface.

Four vanes, similar to those on a bomb, are fitted externally on the tail of the tube to steady the projectile in flight. The weapon is hung under a pair of runners attached to the wing of the aircraft, the total weight of the installation, including the wiring and the eight projectiles, being between 800 and 1,000 pounds.

5. U-BOAT CAPTAIN'S FATAL MISTAKE

An intercepted report that a U-boat had obtained several hits on U.S.S. "RANGER", subsequently magnified into the "sinking" of the carrier, was largely responsible for the sinking of "U 203" by aircraft from H.M.S. "BITER" and by H.M.S. "PATHFINDER".

"U 203" had intercepted a message from "U 404" claiming that the latter had scored several torpedo hits on the U.S. aircraft carrier "RANGER" about April 10, 1943. Kapitanleutenant Hermann Kottman, "U 203's" Commanding Officer, seems to have been greatly impressed by "U 404's" feat, and when he sighted the British escort carrier "BITER" a fortnight later he was so intent on his target that he did not notice one of the carrier's

aircraft until so late that he had to crash dive.

The aircraft had sighted "U 203" travelling at high speed distant about two miles and attacked, dropping two depth charges twenty seconds after the U-boat dived. The plane remained in the vicinity and homed H.M.S. "PATHFINDER" to the area of the attack. The destroyer arrived 20 minutes later and, at 1850, began to search in poor Asdic conditions using the aircraft's sea markers as a starting point.

"PATHFINDER" obtained contact half an hour later and made two attacks, dropping a ten charge pattern on each occasion. At 1950 the destroyer made her third attack, contact being held down to 100 yards.

Kottman had dived so hastily that the diesel exhaust valve had not been properly closed and water began to enter the diesel compartment. He dared not take "U 203" below 200 feet, the S.B.T. gear had developed a fault and could not be used, and "PATHFINDER's" first attacks broke some of the instruments.

The inflow of water through the exhaust valve continued and the water eventually reached the motor compartment, making the submarine heavy by the stern. A number of men were sent forward in an endeavour to regain trim, but after the third attack the destroyer heard "U 203" blowing tanks.

The fourth attack was not made until 2013, and after the ten charges had exploded "U-203" surfaced. "PATHFINDER" was running in for her fifth attack, and as she passed astern she fired her starboard throwers. The U-boat was crippled, but the thrown charges caused the Germans to abandon ship with greater haste than was intended when Kottman came to the surface. The entire crew was taken off by "PATHFINDER".

6. M.L. DAMAGES JAPANESE U-BOAT

A Japanese submarine was probably damaged by H.M.A. M.L.425 on October 13 in position $7^{\circ} 50' S$ $148^{\circ} 05' E$. The depth of water was approximately 47 fathoms. Another M.L. passing through the area of the attack 36 hours later reported a patch of oil approximately 1,500 yards in length, and 60 hours after the attack a U.S. P.T. boat on passage from Buna to Morobe sighted a number of small patches of oil in the same area.

With P.T. 120 and P.T. 133, M.L. 425 was proceeding on A/S Patrol from Morobe to a position 3 miles north east of Mitre Rock (Cape Ward Hunt).

At 2003L on October 13 P.T. 133 reported by R/T a Radar contact bearing 300° . M.L. 425 altered course and, three minutes after the P.T.'s report, Asdic contact was made bearing 306° range 1,500 yards.

Transmissions were switched to the bow oscillator and course was adjusted to bring the ship's head to the target bearing. Extent of target was 10° , inclination opening and the U-boat's estimated course was 266° , speed 2 or 3 knots.

As the attack progressed, the target appeared to draw more rapidly left. The Commanding Officer considered that the target was still moving slowly and a throw-off to port of 20° was made. Contact was lost at 200 yards and the final stages of the attack were calculated by means of MRCS (Mean Range Constant Speed) tables, chronoscope and stop watch.

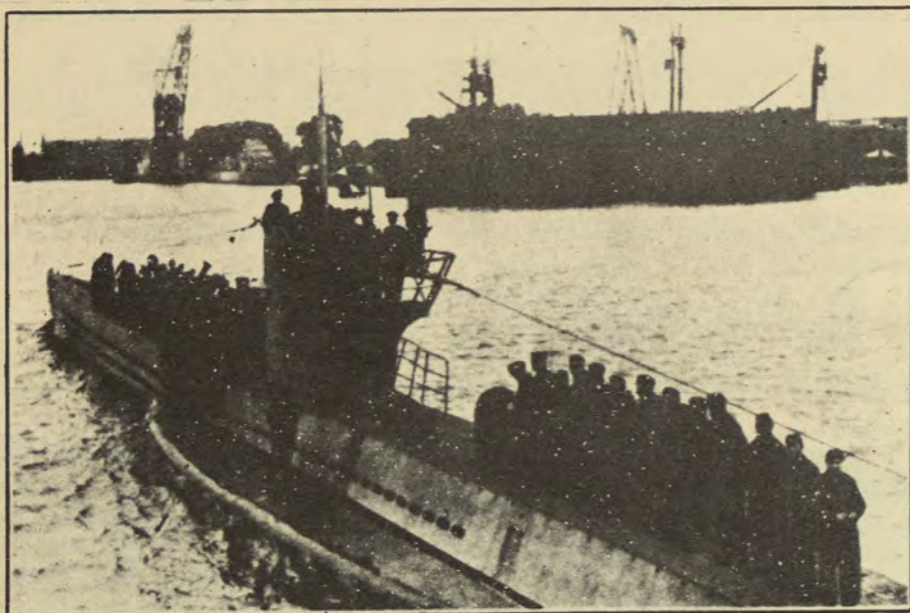
At 2012 a pattern of 5 charges was dropped, three from the rails and two from the "Y" gun, all set to 100 feet. All charges exploded.

Range was opened to 1500 yards and six minutes after the first attack contact was regained on a bearing of 161° . At this stage the asdic set became defective, but repairs were effected quickly and a few minutes later contact was established at 1000 yards. Extent of target was again 10° and the target drew slowly left, again at low speed, on a course estimated at 221° . At 2035 another five charge pattern was dropped, the first and last charges being set to 250 feet, the throwers to 150 feet and the centre charge to 100 feet.

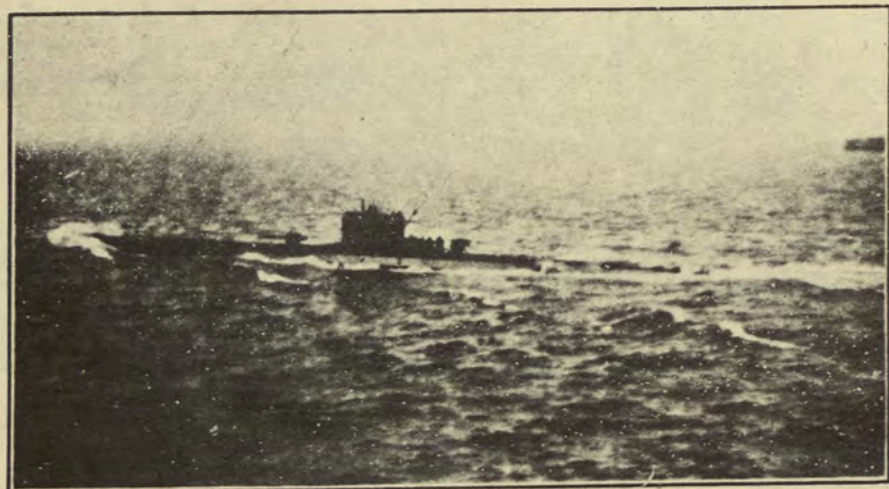
Contact was next made at 2055 at a range of 2,000 yards, but five minutes later the contact faded and although a 360° search was carried out could not be regained. At 2140 engines were stopped and an all round listening watch was carried out for 15 minutes without result and then a maze search was executed.

With P.'s 120 and 133, M.L. 425 carried out a search until day break but no further contact was obtained.

It is considered that the target attacked was a submarine, but in view of incomplete evidence of destruction an assessment higher than "D" - probably damaged - cannot be given.

HEIL! AND FAREWELL

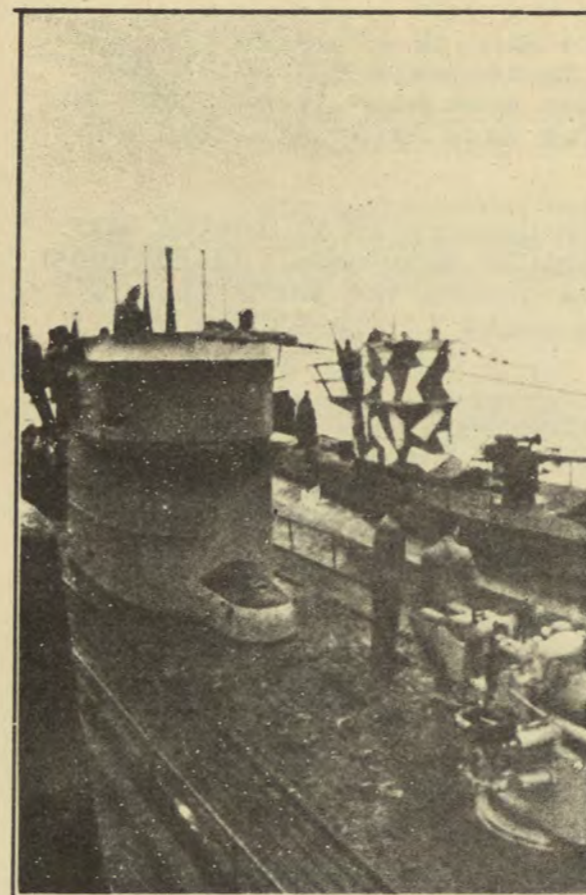
A German U-boat returns to Kiel after patrol. The band, playing on the foredeck, is part of Hitler's welcome given to all submarines returning to port.



Setting out from Kiel on patrol. This photograph was taken from a U-boat survivor.

IN HARBOUR AT KIEL

While German U-boat base officers confer with the submarine's captain, members of the crew begin to store ship.



With her captain, Kapitänleutnant Fritz-Julius Lemp, giving directions from the conning tower, "U-110" moves away from a camouflaged sister ship to begin her last patrol.

Whenever possible, and depth of water permits, A/S craft carrying out promising attacks should lay a buoy over the position so that further intelligence can be obtained.

7. A CRACK U-BOAT DESTROYED

"U-752", which in two years since commissioning had won the reputation of being the crack U-boat of the Third Flotilla, was sunk recently by aircraft from the British escort carrier "ARCHER."

Karl-Ernst Schroeter, her commanding officer, would probably have won the Night's Insignia of the Iron Cross had he not inexplicably surfaced in the vicinity of an air escorted convoy - an error of judgment which cost him his life and resulted in the loss of his U-boat.

"U-752's" first two cruises were made in Arctic waters, and on his second patrol Schroeter, who had no accurate charts of the area, ran his boat aground. Preparations were made to blow her up, but she floated off at high tide and a few days later attacked a small convoy.

The third patrol, which began in January 1942, lasted six weeks and U-752 claimed two ships, totalling 16,000 tons. "U-752" was then recalled to La Pallice where she joined the the Third Flotilla, sailing for the north American coast in the middle of March.

Although surprisingly small claims were made for this patrol, even these were exaggerated. One of the alleged victims, which was claimed as a total loss after a gunnery action, arrived in harbour with nothing more serious than three casualties and some slight damage to her superstructure.

The fifth patrol was made in the Freetown area, and although it began badly Schroeter made a good recovery and sank three ships, said to total 25,000 tons. "U-752" had made contact with a convoy, but was counter-attacked almost immediately. Her Commanding Officer ordered an S.B.T. to be discharged, but the sea water contacted the charge before it had cleared the U-boat and caused it to imitate screw noises.

A heavy depth charge attack followed immediately. The now partly decomposed S.B.T. charge was brought back inside the U-boat to stop the "propeller noises", and the fumes almost suffocated the men in the stern compartment.

After being attacked for six hours the U-boat surfaced with her floor plates awash. Schroeter was not dismayed. He repaired the damage, pursued the convoy to its dispersal point, and then sank three ships.

Ten days before the eighth - and last - patrol Grand-Admiral Donitz arrived to inspect "U-752". His talk with the men did much to raise morale, but after he left an order arrived which caused depression among the crew. By this order any man of the rank of N.C.O. or above became entitled to shoot out of hand any subordinate who showed reluctance to carry out an order promptly.

At about 0730 on May 23, 1943 "U-752" sighted convoy H.X. 239. After being in contact for about three hours, Schroeter astonished his crew by giving the order to surface. It was suspected that aircraft were escorting the convoy and the crew would probably have become still more concerned had they known that their boat was surfacing without the search periscope being manned.

The penalty for this lapse was the loss of the U-boat. A Swordfish from "ARCHER" had already sighted the periscope, and was preparing to attack. One bomb hit No. 4 diving tank and tore a hole in the pressure hull. A stream of water poured into the Wardroom, the batteries were swamped, and Schroeter brought the U-boat up again to try to fight it out on the surface.

The battle did not last long. Only single shots could be fired from the 20 mm. gun, whose repeater gear had jammed, and when a Martlet swept the deck with her fire the Captain was instantly killed.

On deck the First Lieutenant took command. The order "Abandon Ship" had been given, but this officer remained on the bridge until the end, calling for three cheers for the U-boat as she sank.

AN A/S AIR STRIKE

The squadron Intelligence Officer briefs the crews taking part in the Strike. He points to the submarine's last known position and gives the estimated course and speed of the target.



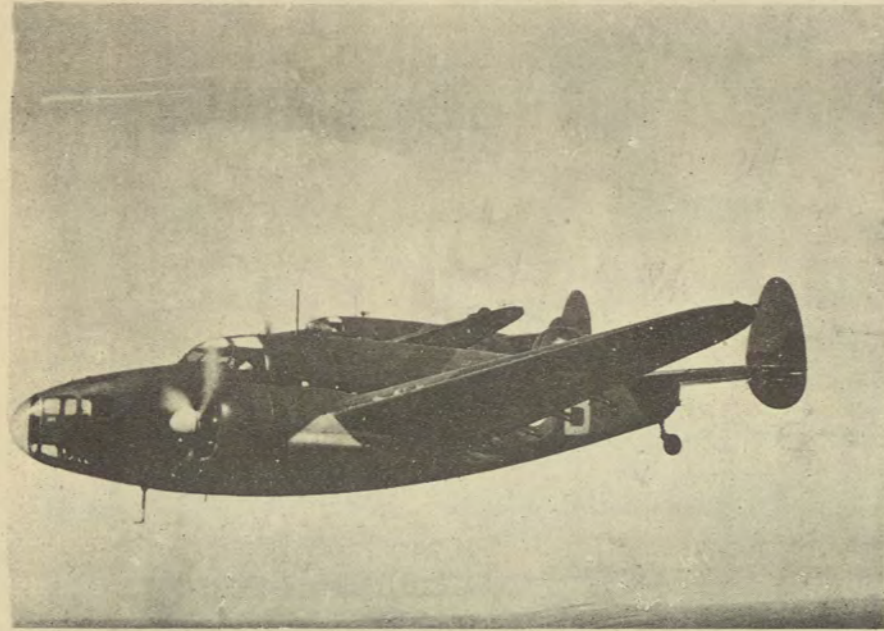
After bombing up, the armourer checks the fusing links and tail pistol of the bomber. These are 500-pounders.



The captain of one aircraft gives final instructions to crew members prior to taking off.



Starting up. While the engines are warming up, the crew check over their equipment.



Two Hudson aircraft on course for the submarine's last known position to begin the search.



The Captain and Navigator check the course and position of the aircraft.



The surface hunting craft are sighted and identification is made by the wireless-air gunner.



Any suspicious disturbance of the water is closely scrutinised by the air crew who know that only a prompt attack will be successful.

SECTION IVINTELLIGENCE1. GERMAN RADAR DECOY BALLOONS

More information about the German Radar decoy balloons is now available, although there is still nothing known of the operational use of the decoys.

The balloons are filled one at a time by hand from an ordinary steel cylinder of hydrogen carried on the bridge and containing enough gas for about 20 balloons. Prisoners state that two cylinders are carried. The balloons are inflated to two feet in diameter, measured by white paint marks on the bridge fairing, and released. The pull of the balloon draws metal foil strips from a small box, after which a mooring wire attached to a floating anchor runs out. Prisoners' accounts of the length of the wire vary from 100 to 600 feet. The anchor is then thrown overboard.

The metal foil strips are the essential part of the decoy, for they are designed to give a large echo of similar magnitude to a submarine. It is very improbable, however, that an exact simulation has been achieved and the decoy balloon is likely to have characteristics of its own which would be noticed by an experienced Radar operator.

2. JAPANESE SUBMARINE TORPEDOES

The following is an extract from an intelligence report prepared by the Commander Southwest Pacific Force Advanced Intelligence Centre.

"Japanese submarine torpedoes have proved uniformly effective and less erratic than American types, although some prisoners of war have complained that they occasionally broach. The 21-inch torpedo is standard on all Japanese submarines except midgets, which use eighteen inch torpedoes. They can attain a maximum speed of 45 knots and can travel 8 miles at 25 knots or 3 miles at top speed. The lateral error is 1.5%. Usually a standard depth setting of 12 feet is used even against heavy ships.

There is no record of the Japanese ever having used acoustic or magnetic devices and the standard torpedo has only an impact pistol."

3. JAPANESE ASDIC AND RADAR

Although all Japanese submarines are equipped with listening gear, only the larger U-boats (the "I"-class, with the exception of the "I-121" and "I-161" types) have Asdic. The listening equipment is very efficient and has an effective range of up to 22 miles against battleships with a directional error of 2.5 per cent. Destroyers can be heard at up to 12 miles and merchant ships at least 6 miles.

To improve the performance of their listening gear, Japanese submarine commanders occasionally patrol at slow speed with all steering gear except diving rudder on manual control and with all ventilation shut off.

Although little is known of the Japanese type Asdic, it is believed that it operates on a standard frequency of 17.5 Kc's. The effective range is between 2,000 and 4,000 yards.

The most modern U-boats, and some of those which have operated in the Bismark-Solomons area are reported to be equipped with an air-warning type Radar.

On August 22, 1943, a Japanese submarine near Port Moresby was detected using Radar on a frequency of 348 megacycles. Signals on this frequency band have been heard previously in circumstances suggesting possible Japanese submarine Radar.

It is probable that the Japs are using a model like the German U-boat Radar which is of similar frequency. If so, the antenna would consist of two vertical non-rotating rods on the forward part of the conning tower arranged in the form of a blunt "V", the point directed ahead. The port and starboard sections are probably alternately switched and the echo obtained from each section is indicated separately in the presentation display. By comparing the two echoes it is possible to obtain a rough estimate of the target bearing. A modified aerial could be employed to provide aircraft warning.

Allied ASV-equipped patrol planes have occasionally found that Japanese submarines have apparently received adequate warning although the planes were approaching upwind during periods of bad visibility.

On August 9, 1943, for example, an enemy submarine was surfacing when picked up on Radar at a distance of 4 miles with visibility not over one mile. The plane, approaching from a down wind bearing, released flares about one-half mile before reaching the position of the submarine. The submarine was fully submerged within 10 seconds after the release of the flares, indicating that it was probably submerging before the plane was visible or within hearing.

4. ENEMY SUBMARINES AT RABAUL

There is evidence that as many as 20 Japanese submarines are operating out of Rabaul where the submarine tender "CHOGEI" is based. Aerial reconnaissance of the harbour reveals that from five to seven submarines of the "I" and "RO-100" classes are at Rabaul at the same time.

Captured documents reveal that during March enemy submarines carried a number of men to the Huon Gulf area in New Guinea. Three I-class submarines are reported to have carried 156, 14 and 54 men respectively in addition to their crews. During May some 400 tons of supplies were brought to the same area.

The following schedule for the entry of Japanese submarines into Lae during August, and the fact that enemy submarine activity has not assumed an offensive role, indicates that the enemy has been forced to use his submarine to supply, reinforce and evacuate his troops rather than to attack our shipping.

The schedule was as follows:

<u>Submarine</u>	<u>Arrived at Lae</u>
"I-38"	August 1, 8, 19, 25
"I-121"	August 3, 10
"I-180"	August 11
"I-176"	August 6, 13, 23, 30
"I-177"	August 7, 14, 31
"I-168"	August 20, 26
"I-122"	August 21, 22.

The I-class U-boats based on Rabaul are used largely for transporting cargo and men. They have been sighted passing Cape Orford on a southerly course with a deck cargo, although sightings have decreased somewhat since the Allied successes at Lae, Salamaua and Finschhafen.

During October photographic reconnaissance revealed submarines in Rabaul as follows:- October 1, five; October 6, six; October 10, five; October 11, six; October 15, seven; October 18, six; October 22, four.

About seven are employed in a shuttle service between Rabaul and Cape Gloucester, Sio, Gasmata and points on the New Guinea coast. At present westbound submarines appear to pass along the north coast of New Britain when bound for points between Sio and Madang, but, having discharged their load, they frequently return via Cape Orford.

These submarines can make the journey from Rabaul to New Guinea in two days and can carry 50 men and from 20 to 40 tons of cargo depending on whether or not deck storage is used. There is no indication that cargo carrying submarines have been diverted southwest for offensive attacks on our shipping.

Some submarines operating in the Solomons are also based on Rabaul. It is believed that three or four U-boats, probably of the 500-ton "RO-100" class, are operating on a shuttle from Rabaul to Buin, taking supplies. It is known that submarines assisted in the evacuation of Vella Lavella and Kolombangra.

This leaves four or five submarines for offensive or reconnaissance operations. The absence of attacks during the last five months indicates that their mission has been to "snoop" although they have made some attacks. One submarine is frequently "fixed" in the vicinity of Woodlark and Kiriwina, and others are known to have been reconnoitering the new Allied bases in the central Solomons.

5. JAPANESE SUBMARINE TYPES

The Japanese submarine building programme is apparently resulting in a monthly production of one "I" class submarine (usually of the Navy Ministry "I-176" type) and two "RO-100" class.

The "I" class types "I-176", "I-177", "I-180" and

"I-181" have been noticed recently operating from Rabaul or Truk and are used primarily for carrying cargo and men. They are known to have been operated on the Rabaul-Huon Gulf Supply service.

There are about a dozen "RO-100" class submarines in operation and "RO-100", "101", "102", "103", "106" and "107" are known to be based at Rabaul.

The "I-176" class probably carries an aircraft in a hangar forward of the conning tower. This type of U-boat is equipped with Asdic, Hydrophone and probably with Radar for defence against aircraft.

Details of the "I-176" class and "RO-100" class follow:-

"I-176" Class

Date of Construction of first ship:	1941
Standard Displacement - Surface	1,609 tons
Length	335 feet
Beam	27 feet
Safe submersible depth	275 feet
Maximum Surface Speed	23.5 knots
Maximum Submerged Speed	8 knots
Cruising Range	8,000 miles at 16 knots
Fuel Capacity	352 tons
Engines	8,700 h.p. diesel
Complement	86 officers and men
Torpedo tubes	six 21-inch bow tubes
Torpedoes carried	12
Guns	One 14 cm (5.5") gun aft; four 25 mm M/G on conning tower.

"RO-100" Class

Date of Construction of first ship:	1941
Standard Displacement-Surface	500 tons
Length	180 feet
Beam	20 feet
Safe Submersible Depth	246 feet
Maximum Surface Speed	14.2 knots
Maximum Submerged Speed	8 knots
Crusing Range	2,500 miles at 12 knots

"RO-100" Contd.

Submerged range	60 hours at 3 knots
Torpedo tubes	Four 21-inch bow tubes
Torpedoes carried	8
Guns	Two 25 mm M/G forward
Diving time	45 seconds
Carries hydrophone gear.	

The "RO-100" class is the largest and fastest growing class of Japanese submarine.

At the end of the third quarter of 1943 there are approximately twenty of these craft afloat. This series was started with the 1941 ("fifth phase") submarine construction programme, which called for 18 vessels. Presumably the current ("sixth phase") submarine building programme continues to emphasize this type which is economical of materials and can probably be built in 8 months to a year.

"RO-100" to "RO-107" are known to have been completed by the end of 1942, and possibly "RO-108" was also finished. It is estimated that four more of this type have been completed in each of the first three quarters of 1943.

6. GERMAN U-BOAT STATISTICS

Estimates of U-boats in commission at the end of August 1943 indicate that the Germans have about 350 U-boats of the 500 ton class and bigger and approximately 50 smaller boats - a total of 400. Of these between 180 and 200 are in operational use.

A further 277 U-boats were either building or fitting out. Of these 213 were building. The following are estimates of the time taken from the laying of the keel to completion.

Class	On the Slips	Fitting Out	Total
1,600 ton	12/13 months	6 months	18/19 months
1,200 "	9/10 "	4 "	13/14 "
750 "	8 "	3 "	11 "
500 "	8 "	3 "	11 "

SECTION VMISCELLANEOUS1. U-BOAT CREWS' MORALE DECLINING RAPIDLY

At the beginning of 1943 U-boat crews of poor morale were regarded as exceptional, but by the beginning of June the heavy U-boat losses and the small number of Allied shipping casualties began to show its effect.

Crews' morale began to decline rapidly, and security consciousness has shown a corresponding fall.

It was considered early in the year that the influx of young men who had received years of Nazi schooling might combat any fall in morale, but it has been found that the spirit of the U-boat arm depends on the older and more experienced officers and ratings. The younger men maintain a high standard of personal morale as a result of their "superior race" doctrine, but this has not had the effect that was anticipated.

Indeed, the value of this personal morale has been more than offset by the young Nazis' inexperience and by the dislike which the older seamen show for the youths with a Hitlerite background. The result has been a cleavage inside the U-boat arm, and this itself may be a minor factor in the drop in morale.

The rapid decline may be hastened by the fact that the German Navy has recently recognised the "Naval Hitler Youth" organisation as its training body. It is a fundamental weakness of the German scheme to train boys to be soldiers and then to expect them to become seamen.

In the matter of security-consciousness the Admiralty has revealed that at least two out of every five prisoners are quite willing to admit that they have had more than enough war and that they consider it as good as lost. Their own war-weariness is increased by depressing letters from their equally tired friends and relations in Germany.

It has been found that most of the U-boat crews come from the interior of Germany, and the men well know the heavy bombing being delivered each day and night in their home towns in the Ruhr and other places in western and north-western Germany. In addition, the ports have received a severe pounding and the recreational facilities once available to U-boat crews on leave are now very meagre. Some ports, of course, are better off than others, and this has caused discontent between flotillas.

Men who once had ample recreation when they returned from patrol now find, for instance, that the water supply at Lorient has been affected, and it does not improve their humour to find that the French are suspected of skillfully aiding the work of British and American bombers.

More powerful in smashing morale than these indirect contributions to the U-boat crews' discomfort is the fact that news of the heavy U-boat losses is gradually becoming known. Every prisoner taken by Allied ships in the last few months has been able to tell of some, if not many, U-boats which he knows to have been sunk.

2. DECREASE IN HYDROPHONE EFFECT WITH DEPTH

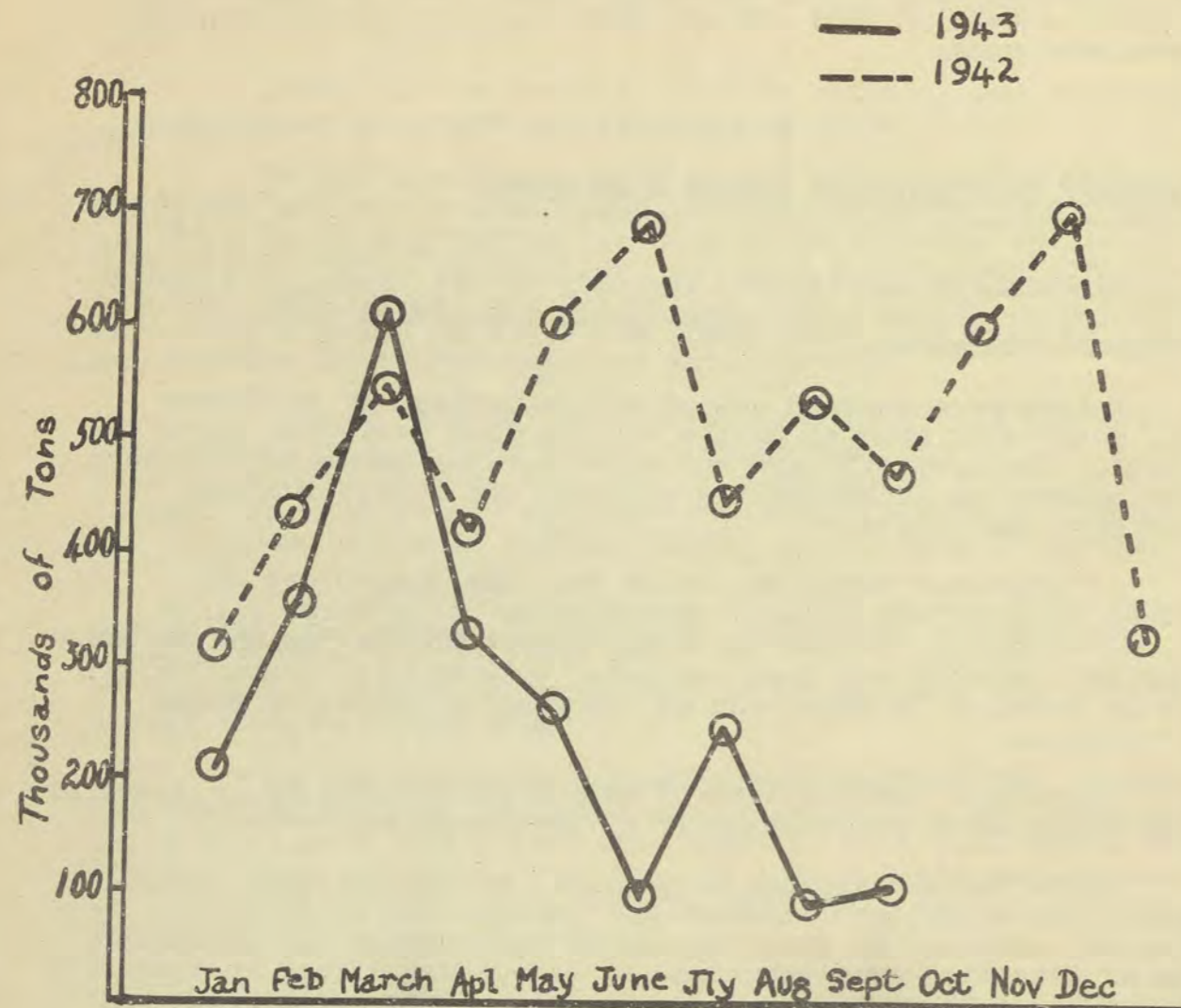
Experiments carried out recently by the Admiralty indicate that propeller noises are substantially reduced as depth of submergence increases.

Trials were carried out on two submarines of different types, runs being made at depths varying from periscope depth to 100 feet. The greatest care was taken by the Commanding Officers of the submarines to maintain a constant 200 revolutions per minute over the course.

At periscope depth the noise from the propellers was observed to be normal i.e. a "swish swish" of a more or less continuous nature. As the depth was increased the "swish" became of shorter duration and less regular. Only an occasional "swish" could be heard at 70 feet, and at 100 feet no propeller noise was detected.

Occasional applications of helm were detected by an increase in the noise level and regularity of the propeller "swish".

There was no evidence at this, or at any previous trial, to suggest that a similar reduction may be expected in purely mechanical noises. At great depths of submergence the limiting range of detection of a submarine by hydrophone effect is therefore likely to depend, not on propeller noise, but on the noise produced by auxiliaries or, at slow speeds, by main motors.

ALLIED SHIPPING LOSSES - WORLDWIDE3. U-BOAT LOSSES

Although complete returns are not yet available there are indications that during September 11 U-boats were sunk or probably sunk, and that four more were possibly destroyed.

Allied shipping losses due to submarine activity were 17 ships totalling 99,869 tons. This is only slightly in excess of the August total which was a record "low" for the war since December 1941. There were no losses by enemy U-boat action in the Pacific, and, for the first time since February 1943, the Freetown and south-east African areas were free from attack.

During October 105 attacks were reported on submarines. This compares with 79 attacks in September. Preliminary estimates of sinkings indicate that 25 U-boats were sunk or probably sunk, 12 by shore-based aircraft, seven by carrier-borne aircraft, and six by warships. Another nine submarines were possibly sunk.

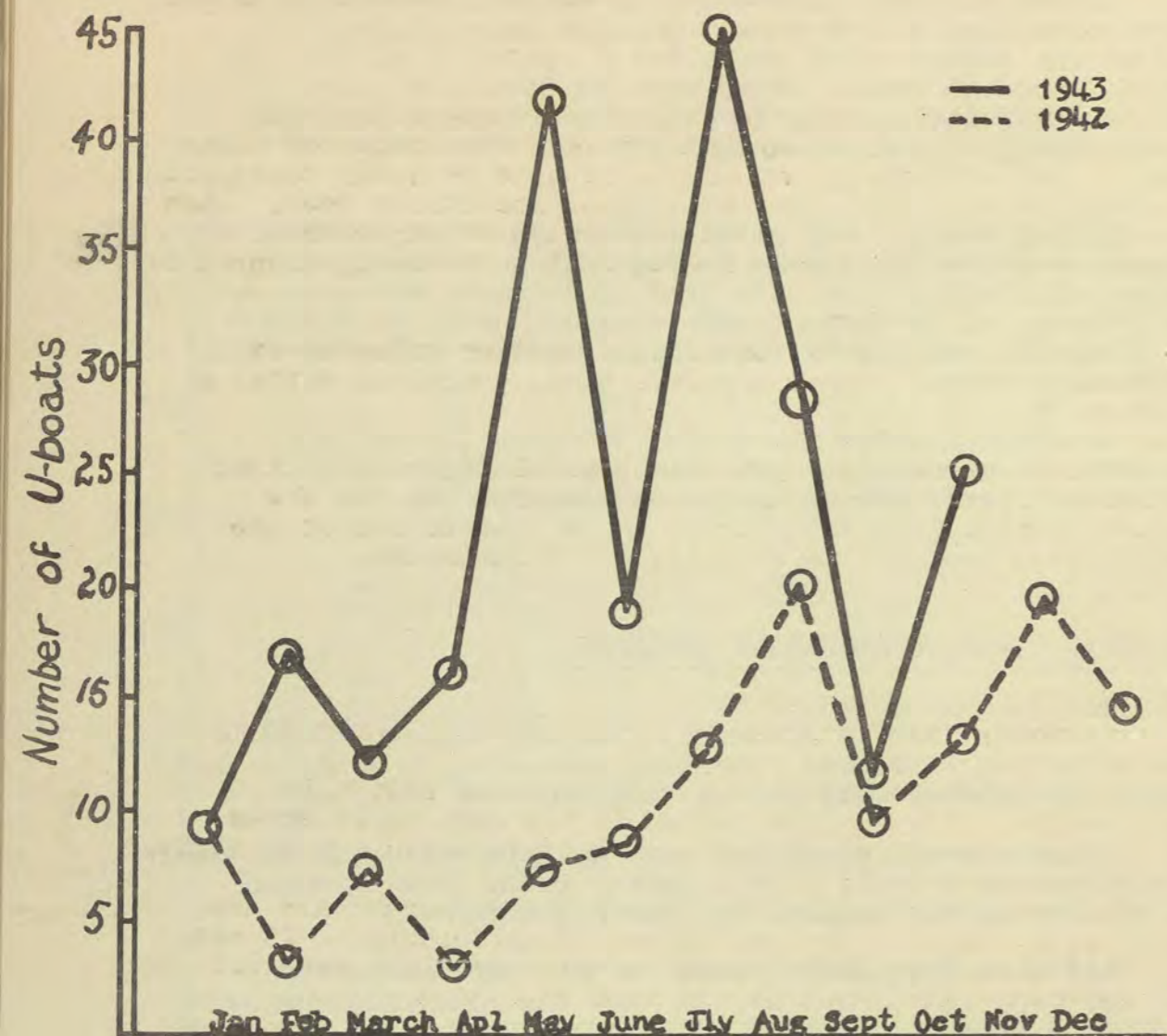
Although figures for Allied shipping losses are incomplete, it appears certain that the total casualties will be as low as losses during August and September.

4. IMPERIAL GIFTS TO SUBMARINE OFFICERS

Presentations to graduates from the Japanese Navy's Submarine School were made recently, according to a Tokio Radio message. The announcement was as follows:

"Commencement exercises were held on August 20 at the Navy's Submarine School. The Imperial proxy gave Imperial gifts of five silver watches to honour graduates."

Gifts of this nature have been a regular Imperial custom for many years, but at one time the presentations were discontinued because students competed with each other to the detriment of their health. Several potential officers who did not reach the "award" standard actually committed harakiri.

U-BOATS DESTROYED - WORLDWIDE5. JAPANESE SUBMARINES' "ACTIVITY"

The following description by a "maru maru Press section member from maru maru base in the south Pacific on the dangerous exploits of Japanese submarines against enemy transports on the important communication line" was broadcast at the end of October by Tokio Radio in a home service news session.

"Not for a single day have Japanese submarines ever neglected their watch on enemy transports. The danger of their exploits is particularly great during attacks on enemy transports in the areas through which the enemy must inevitably pass. Once discovered by enemy planes, which are always in superior formations, crews must be prepared against bombs being dropped on them like rain.

"Supplies carried by submarines must be unloaded at destinations in the shortest possible time, sometimes within a few minutes."

Attacks by Japanese submarines on Allied supply lines were limited to two attacks, both unsuccessful, in the New Guinea area during October. One of these attacks was on the "MOA MOA", and the other on shipping off Finschhafen.

6. DEFICIENCY IN JAP. EYESIGHT

The following extract from the Japanese newspaper "Yomiuru Hochi" indicates that about 40 per cent of Japanese youths of high school and University age have deficient eyesight.

"In order to acquire more men for the (Naval) Air Arm, physical requirements have been lowered considerably. It can be said that those rejected because of weak eyesight have not been a few.

"The percentage of students wearing glasses is as follows:-

Public Schools	10.9%
Middle Schools	30%
Higher Schools	57%

Technical Schools	42.4%
Govt. Operated Universities	50.1%
Private Universities	33.7%

"The field is now wide open, but in order to become a first rate airman perfect eyesight is absolutely necessary."

SECTION VI

MATERIEL

1. DEPTH PREDICTION BY ASDIC

Since it became apparent in the second year of war that U-boats were diving deep to avoid depth charges, efforts have been made to produce a means of determining the depth of a U-boat in time to make use of the information in an attack.

The early sets employ an 18" by 1" quartz oscillator which produces a fan-shaped beam, narrow in the vertical plane and broad in the horizontal plane. The beam, which is transmitted at an angle of depression of 9° from the horizontal and is stabilised to correct for the effect of roll, is effective up to approximately 40° on either bow and over an angle of 5° in the vertical plane.

A more complicated depth-determination set has been developed for use with the Squid. This type incorporates a tilting oscillator whose depression can be varied between the vertical and 45°, and makes possible accurate depth determination over a wide range.

In the simpler sets the depth determining oscillator is housed in a directing gear compartment some 10 feet forward of the main Asdic dome. The oscillator is lowered into the working position by means of hand-operated hydraulic rams.

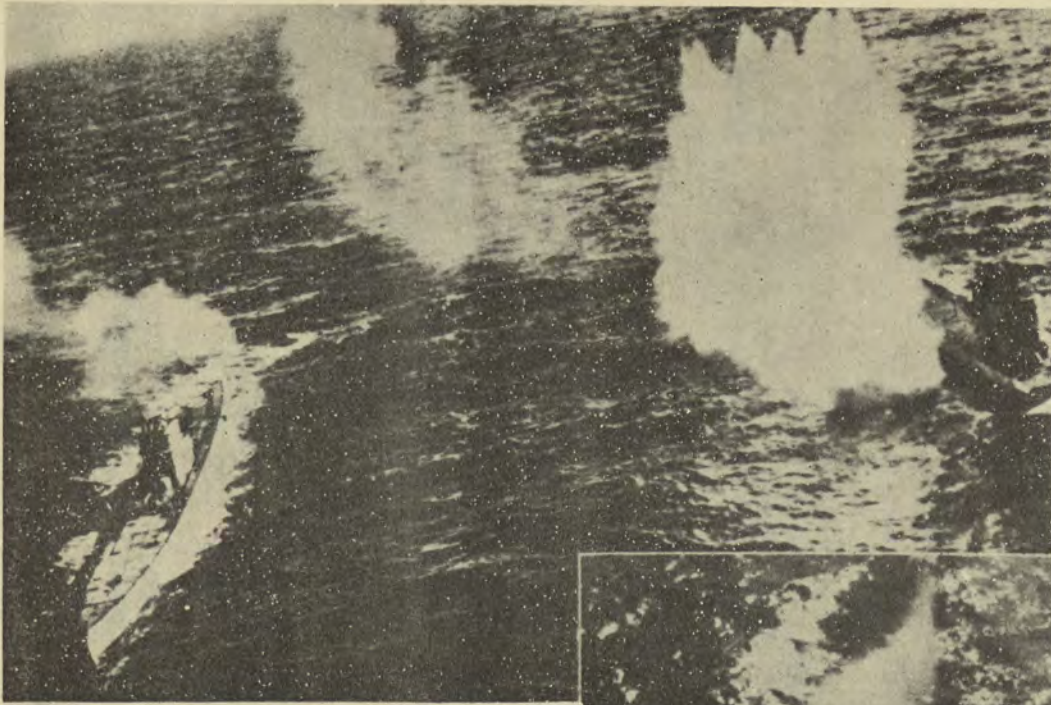
High frequency low voltage power is provided by a valve transmitter, and a separate receiver amplifies, heterodynes and rectifies the signals before they are passed to the stylus of the recorder. The "depth" recorder works in slave with the "range" recorder.

It is improbable that echoes would be received from a U-boat deeper than 500 feet and at depths of less than 100 feet the echoes would be obtained too late for use in the attack.

The error in depth prediction during trials was less than 10 feet in the majority of runs, and the maximum error was 25 feet.

This should not be confused with the "Q" attachment a description of which will be given next month.

SECRET

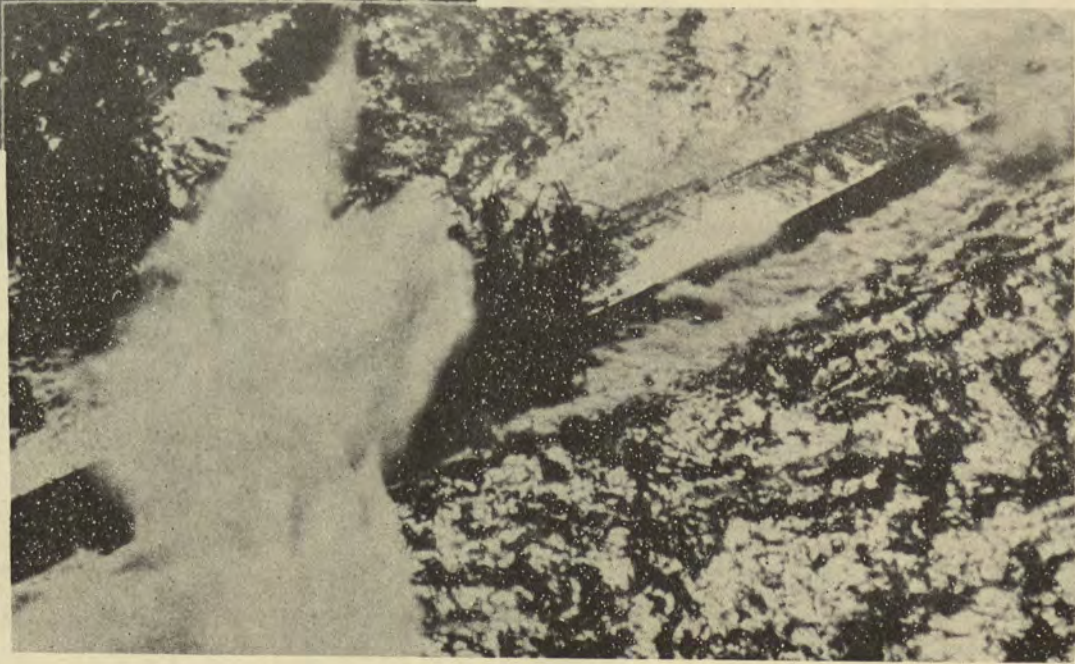


A 730 ton U-boat (left) and a 1600 ton minelaying or supply boat (right) being depth charged in the Atlantic by aircraft from an escort carrier.

-40-

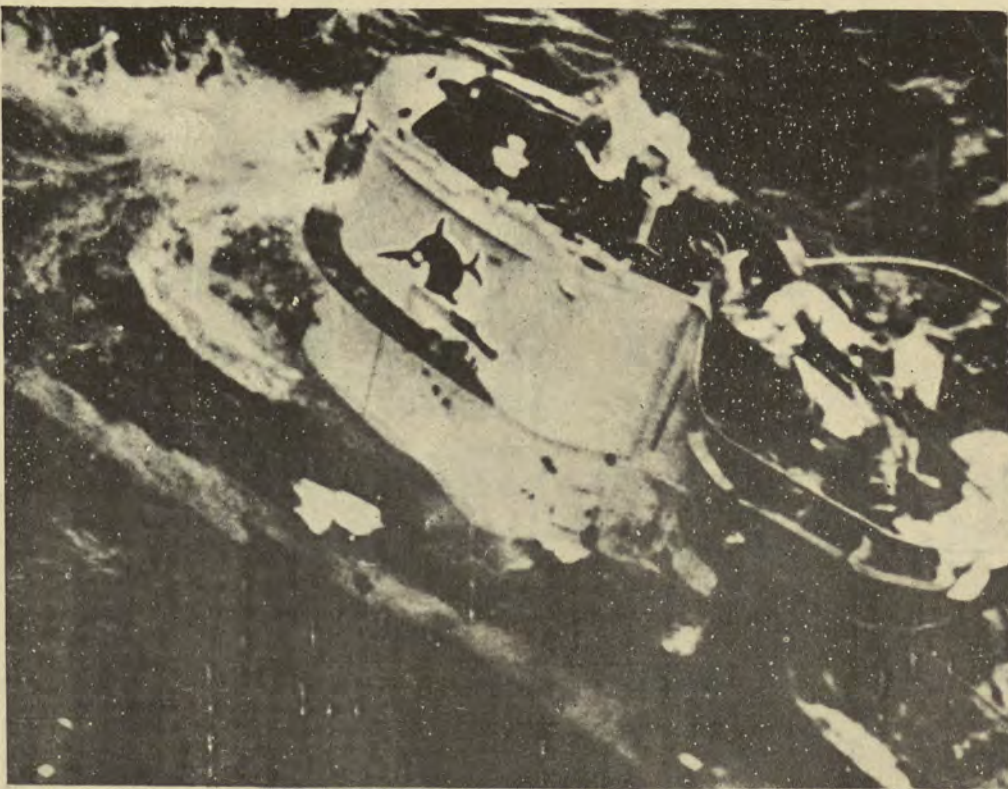
A.C.B. 0233/43 (6)

A 1600-ton U-boat under attack. Note the three twin light anti-aircraft armament on the conning tower.



A 500-TON U-BOAT

SECRET



These pictures show the crew of a 500-ton U-boat abandoning ship after being heavily attacked by aircraft from an escort carrier.

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A.C.B. 0233/43 (6)



2. TYPE 712 HYDROPHONES

The following Admiralty statement on the successful use of Type 712 hydrophone equipment in M.G.B's and M.T.B's is interesting in view of the proposed fitting of similar sets in harbour defence craft in the South West Pacific Area.

Boat	Estimated Range of Detection in Miles.	Result
H.M.M.G.B.21	5	Four E-boats and one Patrol Vessel engaged by gunfire. Hits obtained.
H.M.M.G.B.77	3	Convoy of five ships successfully engaged.
H.M.M.G.B.85	4	Good intercept of two E-boats as a result of hydrophone bearings changing. Enemy engaged by gunfire and hits obtained.
H.M.M.T.B.34	-	Hydrophone effect of reciprocating engines and acoustic sweeping picked up. Two trawlers intercepted.
H.M.M.G.B.77	-	Hydrophone effect obtained from "slow engines." 5,000-ton merchant vessel intercepted and engaged.
H.M.M.G.B.21	3	Six minutes after setting course to intercept, radar contact obtained at 2,000 yards. One E-boat sunk. Wind 4. Sea 3.
H.M.M.G.Bs.333 and 321	-	Hydrophone effect obtained at 2320, E-boats sighted and engaged at 2400. Two destroyed one damaged. Later M.G.B.333 again obtained hydrophone effect and brought three E-boats to action, hitting one.

3. NEW U.S.N. DEPTH CHARGE

A "teardrop" shaped depth charge, known as the Mark 9, has been developed by the United States Navy to provide an anti-submarine weapon with a more stable underwater travel and a higher sinking rate than the cylindrical types.

The new depth charge has a sinking speed of 15.5 feet per second in still, fresh water, compared with about 10 feet per second for the older types.

Mark 7 (U.S.) depth charge pistols will normally be used with the Mark 9 charges.

The shape of the new type depth charge makes it necessary to modify most release tracks, and modified throwers must also be employed if advantage is to be taken of the charges' higher sinking rate. It is necessary to use an arbor (stalk) which will separate from the depth charge after firing.

Weight of explosive is 200 pounds.

Details of the Mark 9 Depth Charge, with instructions for handling, stowage and use, are contained in Ordnance Pamphlet No. 866.

4. C.A.F.O's. ON A/S SUBJECTS 1943

C.A.F.O.	Subject	Brief Description	Work By
1381	A/S Recorders	Methods of finding time to fire	S.S.
1433	Asdic Huts - Communications	<u>NOT</u> applicable to A.M.S.	-
1436	A/S Recorders	New Range Scale *	S.S.
1437	A/S Recorders	Vertical Time Scale *	B.S.
1553	Recorder Tracer	Preservation	B.S.

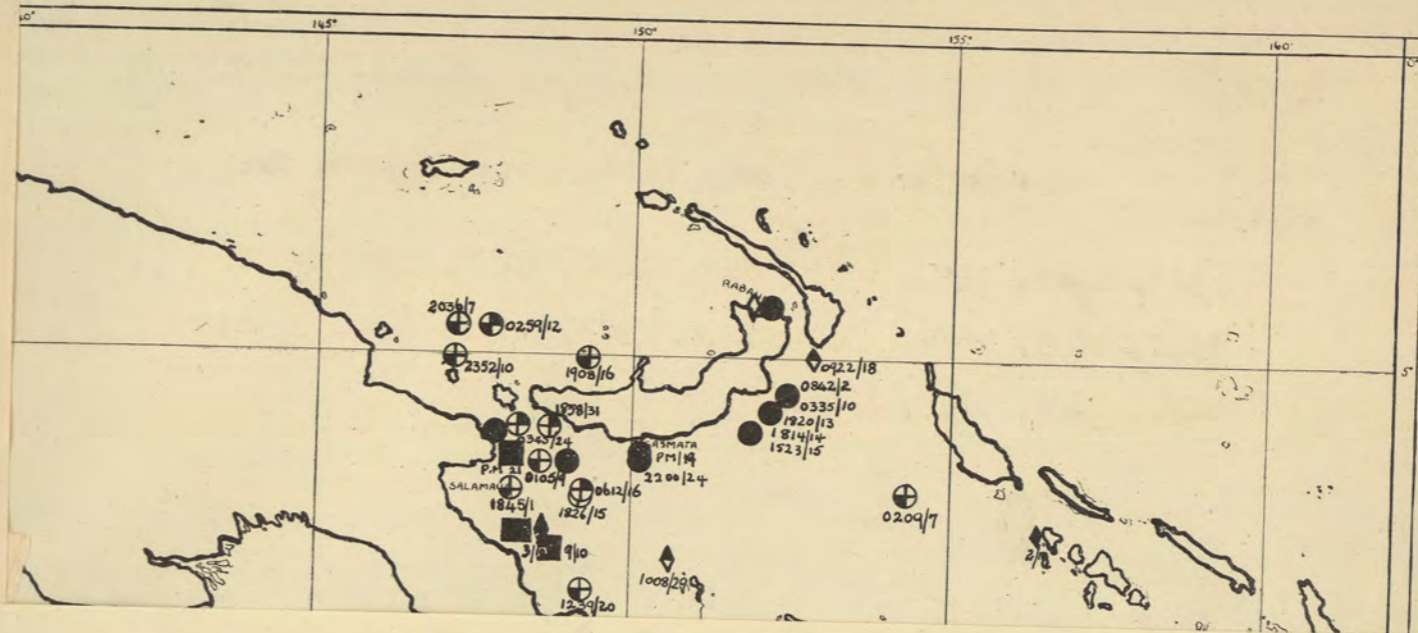
S.S.-Ship's Staff

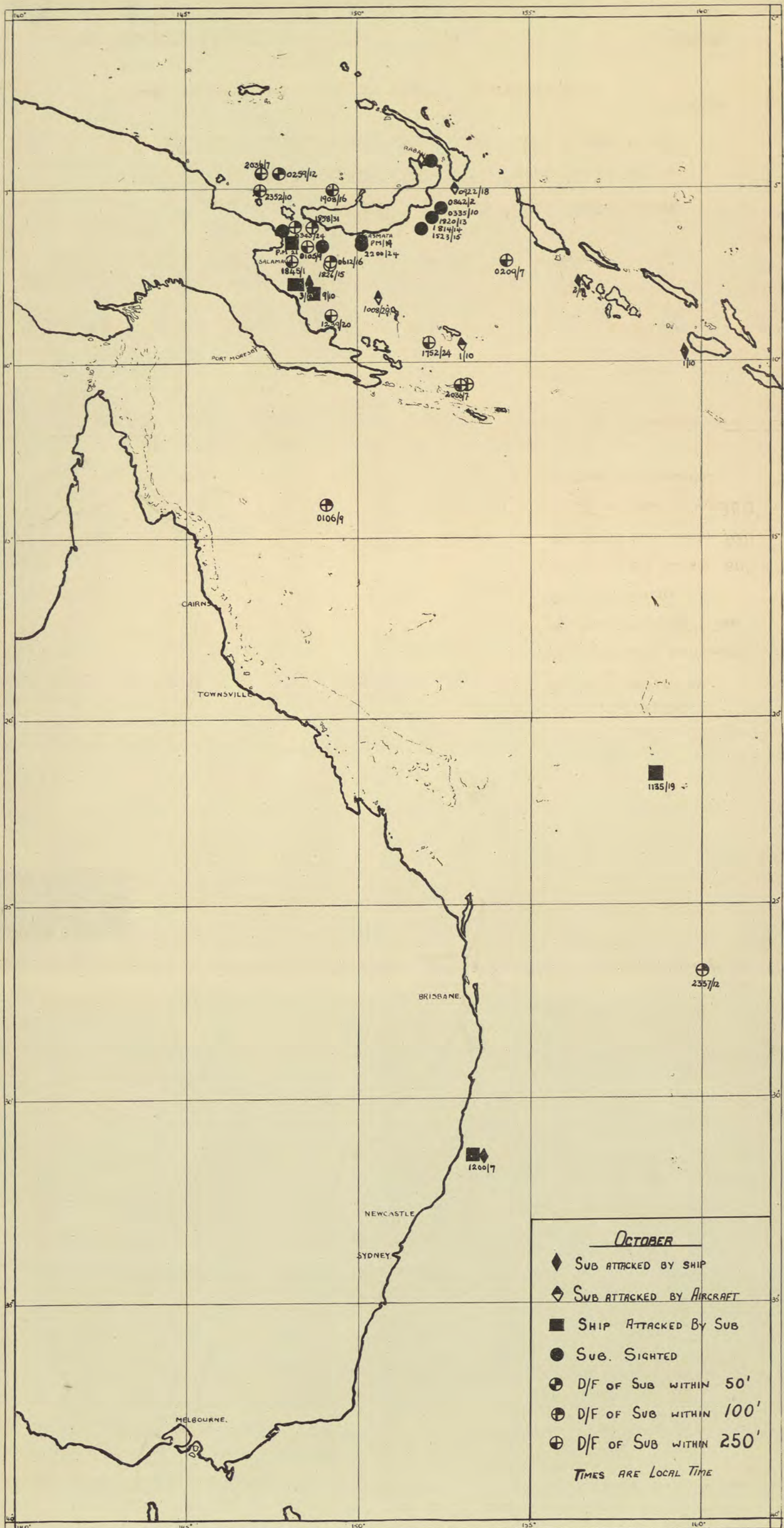
B.S.- Base Staff

* These are being supplied by air from Admiralty.

The following should also be noted where they apply:-

- 1382, 1383, 1434, 1435, 1486, 1487, 1488, 1550, 1551,
- 1552, 1553, 1554, 1591, 1592, 1593, 1594, 1655, 1656,
- 1657, 1658, 1757, 1758.





OCTOBER

- ◆ SUB ATTACKED BY SHIP
- ◇ SUB ATTACKED BY AIRCRAFT
- SHIP ATTACKED BY SUB
- SUB. SIGHTED
- ⊕ D/F OF SUB WITHIN 50'
- ⊕ D/F OF SUB WITHIN 100'
- ⊕ D/F OF SUB WITHIN 250'

TIMES ARE LOCAL TIME



