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A.C.B. 0233/44 (1)

**SOUTH-WEST PACIFIC**

**ANTI-SUBMARINE REPORT**

JANUARY, 1944

*File reclassified as:*

N.I.D.  
NAVAL HISTORICAL RECORDS

*DM (A-28)*

*2/3/05*

*In Review*



ARCHIVE 60

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SOUTH-WEST PACIFIC

ANTI - SUBMARINE REPORT

JANUARY, 1944

ANTI-SUBMARINE  
WARFARE DIVISION,  
NAVY OFFICE,  
MELBOURNE.



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0566-2



CONTENTS

Section I.

COUNTER MEASURES

1. Review for November
2. Review for December
3. Counter Attacks
4. O.C. and C.O. Convoys
5. Underwater Biological Noises

Section II.

ENEMY ACTIVITY

1. Japanese Submarine Activity - Map for December
2. Analysis of Submarine Attacks, 1943
3. Analysis of Convoys - November, December.

Section III.

NARRATIVES

1. Probable Kill in the Solomons
2. U-boat Sinks Nothing - Is Sunk Herself
3. Japanese Raiders
4. Suspected Enemy Transmissions
5. Story and Stories of U-boat Ace.

Section IV.

INTELLIGENCE

1. Japanese Submarines in the Indian Ocean
2. German Acoustic Torpedoes
3. Japanese Midget Submarine Tactics
4. Japanese Submarine Statistics
5. Japanese Radar
6. Specially Fitted Jap. U-boats
7. Japanese Asdic Methods.

Section V.

MISCELLANEOUS

1. Japanese Navy Minister's Review
2. Japanese Submarine Claims -
3. - And Anti-Submarine Claims
4. Seaplane Carrying U-boats
5. German Manpower Shortage
6. Submarine Losses
7. A.M.Ss' Success
8. Axis Meeting in Tokio
9. Japanese Shipping
10. Axis Submarine Casualties.

Section VI.

MATERIEL

1. Ahead Throwing Weapons for M.L's.
2. Vertical Time Scales for Recorders
3. A/S Spares
4. Change of Oscillators
5. Summary of Hedgehog Attacks.
6. Efficiency of Depth Charge Attacks
7. C.A.F.O's. on A/S Subjects, 1943.



ILLUSTRATIONS

"I-15" Class Submarine. . . . .	Pages.. 4, 5.
Japan's Submarine School. . . . .	Pages . 12, 13.
Hope Springs Eternal! . . . . .	Page .. 16.
Japanese Submarine Types. . . . .	Pages . 22 - 25.
A Submarine "Hero". . . . .	Page .. 32.
Submarine Losses, Worldwide . . . . .	Page .. 37.
Allied Shipping Losses, Worldwide . . . . .	Page .. 39.

Japanese Submarine Activity -  
Map for December

Appendix I.

SECTION ICOUNTER MEASURES1. REVIEW FOR NOVEMBER

The majority of Japanese submarines operating in the South West Pacific Area were again active mainly in the New Guinea area, but there was also minor activity in the Solomons area and some indication of Japanese submarines operating off the northern New South Wales coast and off Fremantle.

The Master of the U.S. Army transport "KATOORA" reported that three torpedoes were fired at his ship off Nambucca Heads, New South Wales, on the night of November 20/21. The first torpedo was fired at 2200L and the second at 2203L on November 20 and the third torpedo was sighted at 0100 on November 21.

Allied surface craft and aircraft made a number of attacks during the month. Two east-bound submarines were unsuccessfully attacked by Allied ships off Gasmata at 2100L on November 5, and the same night P.T. boats claimed a torpedo hit on one of two enemy submarines. Allied destroyers attacked a surfaced submarine with gunfire near Empress Augusta Bay on November 16 scoring several hits. On the morning of November 19 a west bound submarine was depth charged by Allied surface units with unobserved results.

Aircraft unsuccessfully attacked a Japanese submarine about 50 miles east of Cape St. George on November 13 and 10 days later a Soupac plane claimed a direct hit on another enemy submarine. Aircraft claimed a submarine as possibly sunk on November 25 and the following day a damaged submarine was sighted west of Buka. After being strafed by aircraft the submarine submerged leaving an oil slick and probably leaving some of its crew dead in the water.

Two attacks were made on November 28 -- an unsuccessful one 60 miles west of Buka where bombs were dropped on a submerged submarine, and another attack west of Empress Augusta Bay where a submarine was bombed and believed damaged.

At 0500L on November 8 a loop crossing was registered on No. 3 loop Fremantle. The signature, which was considered to be a large submarine or surface vessel of 200 tons or above, was followed by a slight tick on the end of No. 2 loop where the loops overlap. U.S.S. "ISABEL" which was on patrol, reported an excellent contact



and dropped three depth charges in an attack which her Commanding Officer believed to be good, but subsequently she lost contact.

An intensive air and Asdic search of the area inside the loops was carried out, but no submarine was found.

## 2. REVIEW FOR DECEMBER

Enemy submarines continued to be most active in the New Guinea - New Britain area although there were also some submarines operating in the northern Solomons. No Allied ship was attacked, but many submarine crews spent Christmas with headaches - not the result of celebrating with Saki, but due to heavy and continuous attacks by Allied ships and aircraft.

Aircraft carried out the majority of the anti-submarine attacks. An Allied plane claimed the destruction of a submarine 40 miles east of Kiriwina Island at 1835L on December 10 while the following day a plane attacked, and is believed to have damaged, another submarine 95 miles west of Shortland Island. An unsuccessful attack was made on December 14 while another Japanese U-boat was bombed with unobserved results near Long Island on December 19.

Successful attacks were claimed on December 14, 15, 16, 17, and 19. In the first attack an aircraft reported leaving a submarine in a sinking condition off Cape Archway and the following day a submarine was claimed damaged in a bombing attack in position 05° 32' S 147° 24' E. An oil slick and bubbles were sighted after a submarine had been dive-bombed 40 miles west of Buka on December 16.

A Catalina which bombed a surfaced submarine on the night of December 17 followed this attack with depth charges. The submarine went down by the stern and was claimed sunk by the aircraft's crew. In the raid by Liberator aircraft on Rabaul at noon on December 19, one submarine was reported to have been blanketed by bombs.

Only two attacks were made by surface craft, both by P.T. boats. The first, three miles north of Sio, was unsuccessful, but in the second the P.T. boat reported the destruction of a small submarine.

The Allied landings on New Britain resulted in a small concentration of Japanese submarines in that area. A midget submarine was reported surfaced off the north west coast of New Britain

at 1145L on December 28 and on the same day it was estimated that four submarines were operating in the approaches to Cape Gloucester.

## 3. COUNTER ATTACKS

A recent report of an attack on a suspected submarine by an A.M.S. indicates that some Commanding Officers still do not appreciate the value of counter (urgent) attacks as a means of harassing the enemy. The A.M.S. was escorting a convoy to Milne Bay when the contact was obtained, but no depth charges were dropped until 24 minutes after the time of gaining contact. During this delay all chance of spoiling the enemy's attack was lost.

It was stated in the report that "before any action could be taken instant echoes was reported", but it is considered that in the 40 seconds between first contact and instant echoes one charge could have been set and dropped with some degree of accuracy.

The importance of a counter attack on doubtful contacts by all ships escorting convoys is emphasized.

The report also stated that "during the initial stage of the attack the black line appeared on the recorder paper indicating that the paper would last for a further half hour, but immediately afterwards the roll ended".

The black line on the edge of the recorder paper indicates that there is only enough paper to complete an attack that has already begun. If an attack is not already in progress when the line appears a new roll should be shipped at once.

## 4. O.C. AND C.O. CONVOYS

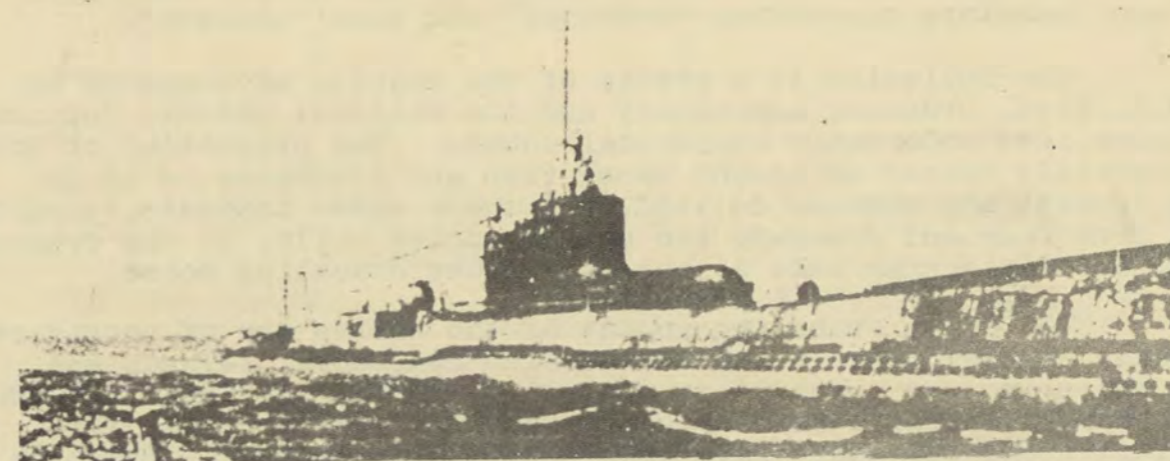
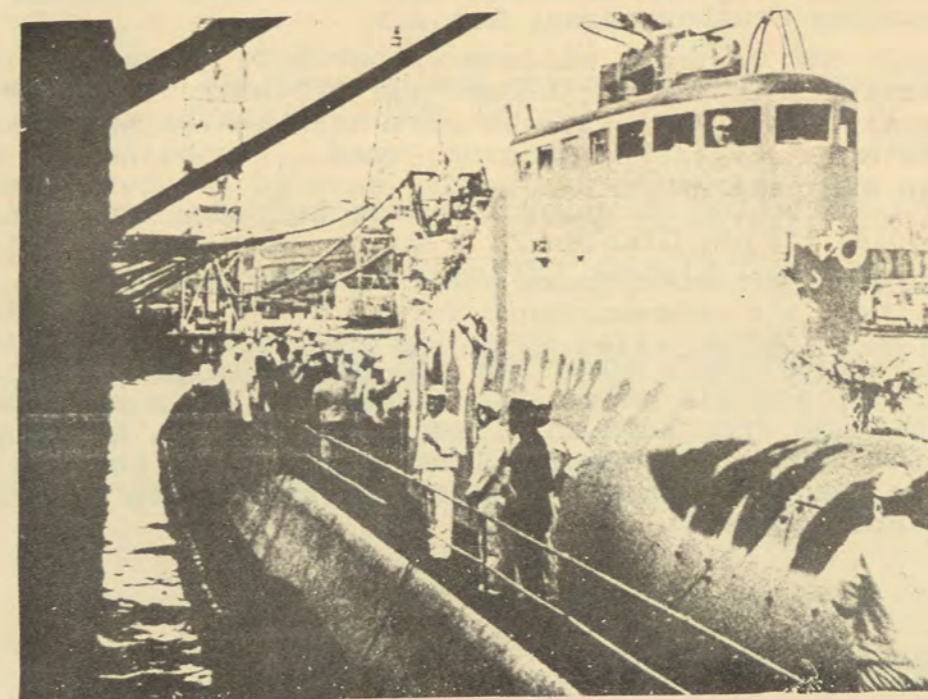
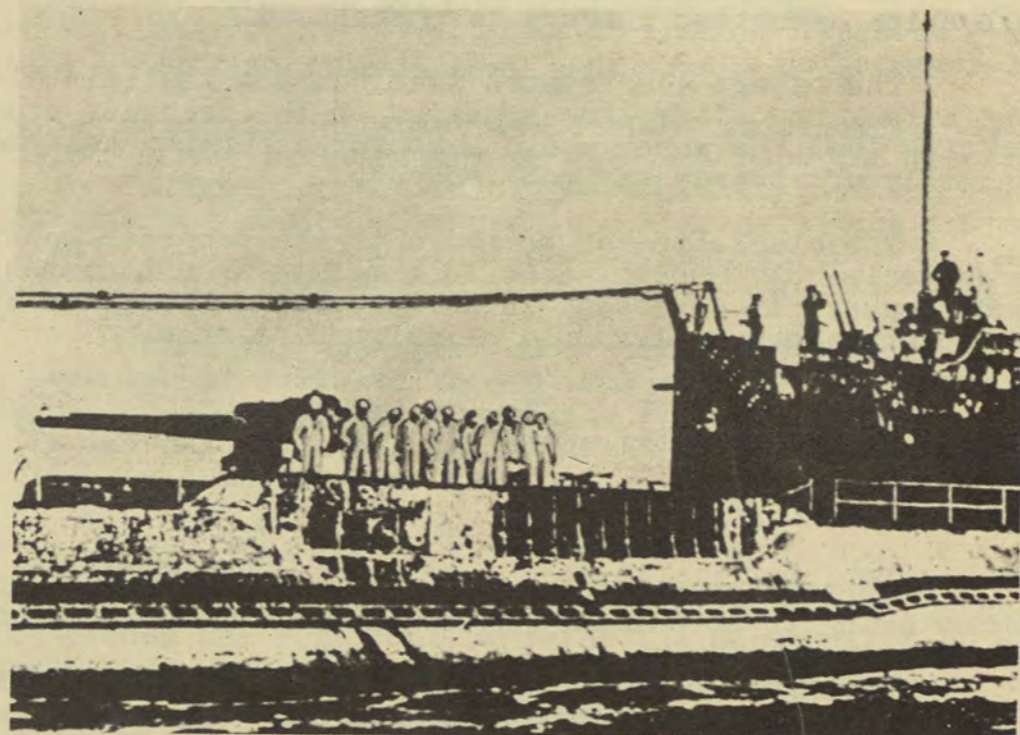
Convoys south of Newcastle were discontinued during December owing to more important requirements for escorts.

Merchant ships in this area are now sailing independently and are routed inshore. Anti-submarine patrols are carried out from Sydney by escorts based on the port.



"I-15" CLASS SUBMARINE.

Captured photographs of a Japanese submarine tentatively identified as "I-15" Class. Boats of this class are 357 feet in length, displace 2,190 tons and have a surface speed of 23.6 knots. Some boats carry an aircraft and a hangar can be seen forward of the conning tower in these photographs. The deck gun is a 5.5 in. and the machine guns on the bridge are .98 in..





The following arrangements have been made with the Air Officer Commanding Southern Area, R.A.A.F.

- (a) Anti-submarine air cover during daylight, to maximum effort, will be provided for Special Ships, Class 1, without any special request.
- (b) Anti-submarine air cover, during daylight, will be provided for Special Ships, Classes 2, 3 and 4, upon receipt of a request from the Naval Liaison Officer, Air Operations Room, Southern Area.
- (c) In regard to air cover for all other independently routed merchant vessels, and air patrols to seaward, a daily anti-submarine patrol will be made from Eden to Wilson's Promontory, 40 miles to seaward, in the form of a creeping line ahead patrol between Eden and Mallacoota, and of a parallel track search between Gabo Island and Wilson's Promontory.

#### 5. UNDERWATER BIOLOGICAL NOISES.

A recent report of attack by an escort shows that "rattle" hydrophone effect can be obtained from current eddies in the vicinity of coral pinnacles.

An echo was obtained at 2,600 yards and no movement of target or doppler was noticed. The hydrophone effect continued in spite of the apparently stationary nature of the target and the echo was therefore classified "doubtful" and then "non-sub".

The following is a precis of the results of research by the U.S. Naval Ordnance Laboratory and the National Defense Research Committee into underwater biological sounds. The production of sound is apparently nearly as common among fish and crustacea as it is among insects and animals on land. As their names indicate, singing fish, drum fish and croakers are notably noisy while, in the crustacean class, certain shrimp make a loud continuous crackling noise.

The crisp crackling sounds of the shrimp are of considerable intensity and may prove a serious problem near coral islands and reefs where in some areas it completely dominates the field of underwater sound. Sporadic fish noises which may puzzle, rather than trouble, Asdic operators have been reported in depths as great as 2,000 fathoms as well as in shallow coastal waters.

Sounds produced in shallow water by the singing fish have been described as crooning, humming, croaking and growling. Mewing and groaning sounds have been recorded in 2,000 fathoms off the coast of California. Many unexplained sounds, some of which were probably produced by fish, porpoises or whales have been reported by American submarines in the western Pacific.

A sound survey is now being conducted in the South Pacific to determine the types of bottom sediments, the depths, and the distances from shore or from coral reefs where noisy areas can be expected and where submarines may find useful concealment from Asdic detection.



## SECTION II

ENEMY ACTIVITY1. JAPANESE SUBMARINE ACTIVITY - MAP FOR DECEMBER

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	-	-	-	-
NOVEMBER	1	-	-	-	-
DECEMBER	-	-	-	-	-
TOTAL	29	11	49,941	4	26,230

3. ANALYSIS OF CONVOYS - NOVEMBER, DECEMBER

AREA	No. of Ships		Tonnage	
	November	December	November	December
Thursday Is. - Darwin	8	9	46,733	26,583
Barrier Reef - Brisbane	85	97	372,832	431,038
Brisbane - Sydney	65	54	245,562	198,186
Newcastle - Melbourne	147	34*	566,302	118,807
Coral Sea	203	228	1,039,753	1,175,201
Arafura Sea	1	5	7,176	11,339
TOTAL	509	427	2,278,358	1,961,154

\* O.C. and C.O. Convoys were discontinued on December 7.



SECTION IIINARRATIVES1. PROBABLE KILL IN THE SOLOMONS

A Japanese submarine was probably sunk after it had been depth charged by a destroyer, forced to surface and engaged with gun fire and later bombed by aircraft.

The U.S. destroyer "SAUFLEY" while escorting a convoy South East of the Solomon Islands on September 15 received a report that a torpedo had been fired at one of the escorted ships. An Asdic search, which lasted for almost two hours, was begun at 1100L, and at 1251 contact was made with a submarine at a range of 3,000 yards.

The first attack was made from the submarine's stern, characteristics of the run-in being a relative speed of 10 knots, marked low doppler and steady bearing of the target. The first of nine charges was dropped at 1257 after contact had been lost at 200 yards.

Contact was not regained until 1342 when the Asdic operator reported a contact at a range of 1500 yards. At the same time, lookouts sighted what appeared to be a large disturbance on the water on the bearing of the contact. Six depth charges were fired during this attack, but it was considered that the submarine had passed down the port side.

Contact was regained at 1353, range 1350 yards, and the submarine was believed to be stopped. A nine charge shallow pattern was fired. The fourth attack with five charges was made and three minutes later a "boiling" disturbance of the water was sighted in the position of the attack.

Air bubbles were coming to the surface as "SAUFLEY" turned to make another attack and then the submarine came to the surface listing at about 45°. The U.S. destroyer altered course and rapid independent fire was opened at a range of 1900 yards. Hits were believed to have been scored on the base of the conning tower and one hole was seen in the upper part of the tower.

A Catalina aircraft which had been assisting "SAUFLEY" saw large air bubbles rising to the surface and had watched the

submarine surface in the centre of the disturbed water. The aircraft attacked at about 100 feet while "SAUFLEY" was still firing, the Catalina barely clearing the splashes from the shell fire.

Besides engaging the submarine with machine-gun fire, the Catalina dropped two depth charges, one of which struck the water about 70 feet from the submarine and failed to explode. The other charge detonated about 20 feet from the target and when the plume had subsided the submarine was no longer visible.

A few minutes later "SAUFLEY's" operator reported an underwater explosion. Wooden fragments some 10 feet long, and large amounts of oil were seen. An Asdic contact was then made at 2,400 yards, the target being stopped. A five charge pattern was dropped and search was continued until 0600 the following morning without regaining contact. Large oil bubbles were rising to the surface from a fixed position.

2. U-BOAT SINKS NOTHING - IS SUNK HERSELF

"U-528", a 740 ton U-boat which was constantly being surprised and bombed or depth charged by aircraft during her sole patrol, was sunk by H.M.S. "FLEETWOOD" before she had made an attack on Allied shipping.

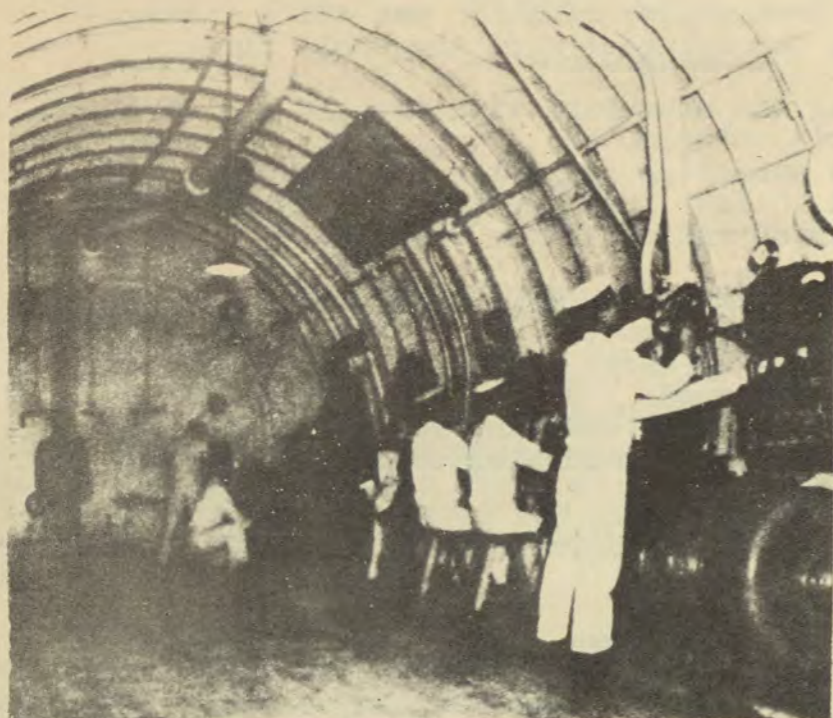
Built at Hamburg, "U-528" carried one 4-inch gun forward four light machine guns on the bridge, two 20-mm. guns abaft the bridge and a 1.45-inch gun aft. Of the 21 torpedoes carried, only six were air torpedoes. The remainder were electric and no "Curly" torpedoes were carried although the tubes had been modified to enable this type to be fired.

"U-528's" early history did not augur well for her future. Her Commanding Officer, who was alleged to have been "politically unsecure" fell foul of the Staff Officer conducting tactical exercises off Pillau and, after a number of quarrels, was relieved. The second series of tactical exercises were even more unfortunate. The new Commanding Officer, von Rabenau, was a drunkard and on the first occasion of putting to sea was so drunk that "U-528" rammed a torpedo recovery vessel and suffered damage to her superstructure.

After repairs "U-528" went to Stettin for final adjustments. She had only to complete a trim test when von Rabenau, again drunk, rammed a pier and damaged her bows.



JAPAN'S SUBMARINE SCHOOL

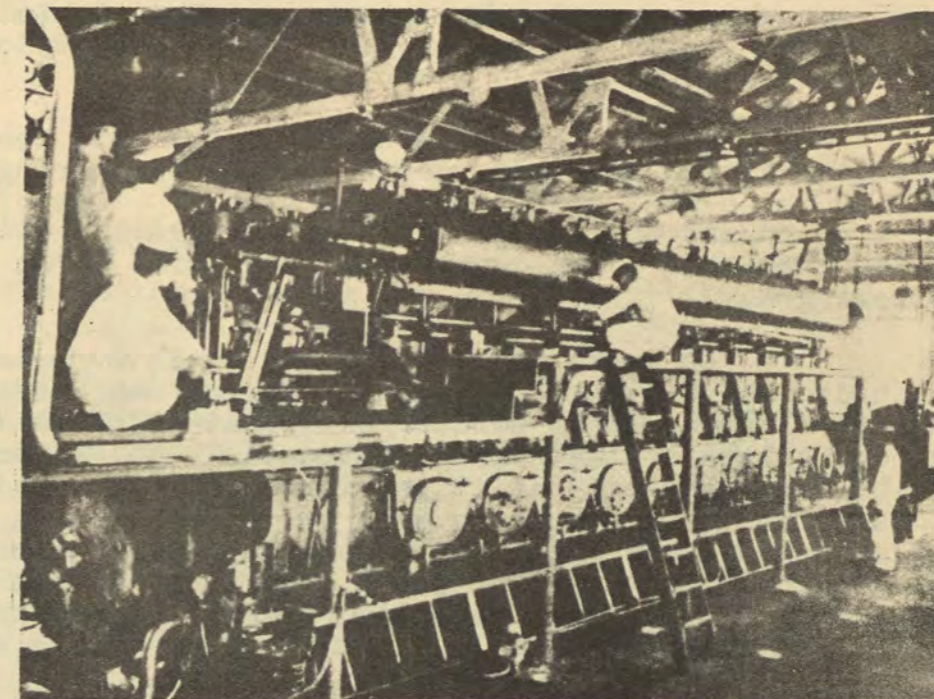


Potential Japanese submarine officers and ratings learn U-boat manoeuvring in this chamber at Kure Naval Station Submarine School

A Jap. instructor explaining underwater propulsion to a class of too "obviously" interested ratings.



The diesel workshop at Kure Submarine School, where future U-boat engineers are given instruction.



Batteries — the source of motive power when the submarine submerges. Japanese ratings learn how to maintain giant storage batteries prior to passing out.



On April 15, 1943, "U-528" left Kiel with five other U-boats for her first patrol. Two days later she parted company with the other boats. On April 24, a small convoy of four 2,000 - 3,000 ton ships escorted by two vessels was sighted. Two aircraft were circling over the convoy, but "U-528" attempted to approach to torpedo an escort.

Before this plan could be put into operation, however, a counter attack was made, depth charges fracturing an oil tank and causing the U-boat to leave an oil trace. One of the "Q" tanks had also burst, but in spite of this damage the U-boat attempted to shadow the convoy, being attacked, this time by an aircraft, on the following day.

On April 28, "U-528" was again surprised by an aircraft which dropped four bombs or depth charges near her. The damage was such that the Engineer Officer said that he could no longer accept responsibility if the patrol continued. No. 1 torpedo tube forward had been damaged so that it was impossible to withdraw the torpedo and some of the air bottles were put out of action. After remaining submerged over night, von Rabenau signalled the Commander-in-Chief U-boats that "U-528" could only dive "within restricted limits". Three days later, after receiving orders to rendezvous with a supply U-boat and then return to Lorient, "U-528" turned for home.

At dawn on May 11 the U-boat surfaced, but was again surprised by aircraft and bombed. The aircraft also dropped a smoke float and this was sighted by H.M.S. "FLEETWOOD" who made an accurate depth charge attack.

The charges exploded against the U-boat's bow compartment causing a water entry which badly upset trim. Survivors said that they then went to a depth of some 700 feet, electric motors being run at full speed to prevent the U-boat from sinking deeper. "FLEETWOOD" then re-established Asdic contact at a range of 1,500 yards and made five more attacks dropping 10 charge patterns on each occasion.

During these attacks "U-528" used her S.B.T. gear. However, each time tanks were blown in order to keep the U-boat from sinking too deep the noise made by the damaged blowing gear was far louder than the S.B.T. charges.

Finally the torpedo in the damaged forward tube began to run. This scared von Rabenau, who, after reviewing other damage which included a water-logged diesel, many smashed gauges and controls and a further series of air bottles out of commission, decided to surface and abandon ship. Prisoners said that their boat surfaced at such a steep angle that it was not possible to stand.

"FLEETWOOD" began to fire at the U-boat immediately it appeared, but ceased fire when the U-boat's crew jumped into the water and "U-528" sank by the stern.

### 3. JAPANESE RAIDERS

Japanese surface raiders had, as far as is known, made only two cruises up till June, 1943, and on both occasions the sorties were carried out in the Indian Ocean by two ships operating together.

The first cruise is thought to have begun from Singapore or some other East Indian port about the end of April, 1942, and appears to have been carried out by two sister ships of the "AIKOKU MARU" class.

About May 10 they attacked the Dutch Tanker "GENOTA" in the Indian Ocean. No distress message was received from the tanker which appears to have been sent, with a prize crew, to a Japanese controlled port for she appeared before a Japanese prize court on August 3, 1942.

Nothing is known of the raiders' movements for the next three weeks although it is thought that they remained in the central Indian Ocean until towards the end of May when they probably proceeded towards Madagascar. The unidentified twin-float monoplane sighted over Diego Suarez on May 29 is thought to have come from one of the raiders.

Japanese U-boat and midget submarine operations began in the first few days of June in the Madagascar area and the two "AIKOKU MARU" class raiders made their first attack off the southern end of the Mozambique Channel early on June 5 when they attacked the "ELYSIA" with gunfire. One of the raiders catapulted off a small plane which bombed the "ELYSIA" which was finally sunk by a torpedo from one of the raiders.

The Japanese made no attempt to take prisoners and Allied ships rescued the majority of the survivors shortly afterwards.

A number of ships were attacked in the same area during the next few days but U-boats were believed responsible for all these attacks.





The Japanese caption to this photograph reads: "A Japanese submarine crew scans the horizon for any puff of smoke from enemy craft." The proximity of the trees in the background suggests that they will be out of luck.

The two raiders were thought to have remained in the Madagascar area or in the central Indian Ocean to attack shipping or to refuel U-boats operating off Madagascar.

On the evening of July 12, S.S. "HAURAKI" made "QQQQ" later reporting that she was being captured by Japanese raider. Nothing more was heard of the "HAURAKI" or her crew, and no further attacks or incidents attributable to these raiders were reported.

The second pair of raiders sailed in September or October, 1942 from Singapore or some other East Indian port. One of the raiders was of the "AIKOKU MARU" class and the other of the "KIYOSUMI MARU" or "KUNIKAWA MARU" class.

Early on November 11 H.M.I.S. "BENGAL", escorting the Dutch Tanker "ONDINA" sighted two ships proceeding on a north easterly course at high speed. "BENGAL" and "ONDINA" engaged the two raiders with gun fire. The "AIKOKU MARU" class raider was hit aft, caught on fire and after an explosion sank by the stern.

The second raider engaged and repeatedly hit "ONDINA" and "BENGAL" was also hit. The tanker's crew abandoned ship when their ammunition was expended, and the raider closed and machine-gunned survivors who had taken to the boats, causing a number of casualties. "ONDINA's" crew returned to their ship after the action and both "BENGAL" and the tanker reached port.

#### 4. SUSPECTED ENEMY TRANSMISSIONS

On December 18, H.M.A.S. "LITHGOW" while escorting a convoy from Port Moresby to Cairns, heard transmissions which were thought to come from an enemy submarine. Wind and sea conditions were almost calm and the ships in convoy were not using any kind of echo-sounding device. "LITHGOW" ceased transmitting with her Asdic and found the source of the interference to be 20° abaft the port beam. Course was altered towards the source of transmissions and speed was reduced. The transmissions ceased after some minutes and no echo contact could be established during a square search of the area.

The transmissions were very high in pitch and weak in volume, the S.D. operator who heard them describing them "as something like the cheep of a bird". The transmission interval was timed by chronoscope for some time at 4,000 yards, but later altered irregularly to 5,000 yards. The amplitude of the sound in the phones varied in a manner similar to that caused by sweeping.



## 5. STORY AND STORIES OF U-BOAT ACE

Lieutenant Commander Klaus Bargsten, commanding officer and sole survivor of "U-521" was a very successful captain and, when taken prisoner, proved an amusing raconteur.

Bargsten had made six patrols in "U-99" as First Lieutenant and when he left her in December 1940 she had sunk more than a quarter of a million tons of shipping. He was then given command of "U-563" and made two extremely successful cruises in her, sinking a destroyer and about 35,000 tons of merchant shipping.

During one of these patrols he was attacked by one of his own aircraft which signalled that it had sunk a British submarine. "U-563" was undamaged, however, and Bargsten, who had intercepted the aircraft's signal, sent a message to Admiral Donitz informing him that the "British submarine" had been "U-563".

On his third patrol, however, British aircraft attacked and this time "U-563" was badly damaged. Bargsten was ordered to Lorient for repairs, but when he reached port it was found that his boat had been so badly battered that it would have to go back to the builders at Hamburg.

"U-563" could dive but could not proceed submerged and apparently could not steam very fast on the surface. Bargsten spent 14 days on passage from Lorient to Bergen, the time at sea being lengthened somewhat by the co-operation of a Norwegian fisherman who sighted the U-boat on the surface and gave Bargsten direction to a port 40 miles away.

It was not until late in January, 1942, that the U-boat reached Hamburg. Convinced that "U-563" would not be of much use again, Bargsten obtained command of a new 750-tonner, "U-521". In his first patrol, which lasted nine weeks, he claimed four merchant ships, a damaged ship and a corvette.

The second patrol, which began in January 1943, was in the Azores area. After a successful attack on a convoy "U-521" was almost rammed by another U-boat, and, while taking avoiding action, "U-521" attracted the attention of the escort. In the following attack 70 depth charges were dropped, but Bargsten's skillful handling of his boat and use of S.B.T. baffled the surface craft.

Then Bargsten repeated his performance of the previous cruise. In bright moonlight he came on a merchant ship lying stopped with a corvette patrolling on her dark side. He boldly came down moon on the surface, saying to the First Lieutenant as he did so: "I feel like a man walking naked through the streets of a city". He fired six torpedoes at the two ships, sinking both of them.

After being 79 days at sea "U-521" returned to Lorient where Bargsten was credited with 39,000 tons of shipping and one corvette. Three days before he sailed on his last patrol he received the Knight's Cross.

About mid-day on June 2, U.S.S. "PC 465" attacked "U-521" with five depth charges. The lights went out, motors stopped, and water began to enter the control room. Bargsten immediately ordered the boat deeper, but the depth gauges were found to be out of order. When the order to surface was given the U-boat was actually only at 50 feet and it shot to the surface rapidly.

Bargsten opened the conning tower and went up on the bridge only to find that he was under fire from "PC 465" who was turning to ram about 400 yards away. Realising his plight he gave orders for the abandoning and flooding of the boat. To his surprise the first head to appear was that of the Engineer Officer whose duty it was to stay below and open the vents.

Then the U-boat began to sink rapidly and Bargsten found himself in the sea. When last he saw "U-521" water was pouring down the open hatch.

As a midshipman, Bargsten had served in the Admiralty yacht "GRILLE". For a short time he was a member of the Nazi party, but his family made so much ado about it that he resigned.

When interrogated, Bargsten demonstrated that he was an accomplished raconteur, and he told a number of stories about the German leaders.

On one occasion when Dr. Goebbels was visiting a U-boat an orchestra was playing. Finding that the noise of the ventilators interfered with the music, Goebbels complained to the captain and ordered him to do something about it. The captain, who did not like Goebbels's manners, kept him engaged in conversation while he "manoeuvred" him towards one of the offending ventilators.

The Captain then quickly ordered the shutting of the ventilators and the little Minister of Propaganda received a resounding blow on the buttocks.

On another occasion Hitler gave one of his not infrequent temperance lectures to his staff. The lecture was so violent that when it was all over and Hitler left the room, the audience were so fatigued that they felt that only one thing was called for -- a large drink.

The bottle had just been opened when well known foot-steps were heard outside. The bottle was hastily put under the table. Without a word Hitler stalked into the room kicked the bottle over and stamped out again.



SECTION IVINTELLIGENCE1. JAPANESE SUBMARINES IN THE INDIAN OCEAN

At the beginning of November two Japanese submarines were known to be operating in the Indian Ocean - one in the Mozambique Channel and the second probably proceeding to patrol in the Gulf of Aden area. On November 13 the Commander-in-Chief, Eastern Fleet estimated that the submarine last reported in the Mozambique area on November 7 might still be patrolling in the channel if it were not already on passage back to its base.

A report of the shelling of S.S. "SAMBLADE" on November 10 north of Socotra indicated that another Japanese submarine was operating in that area. There was some indication that a submarine may have been reconnoitring the Trincomalee area on November 12.

On November 26 the disposition of Japanese submarines in the Indian Ocean was as follows:-

One in the Gulf of Aden or approaches, one in the Seychelles area, one homeward bound from Europe estimated within 300 miles of position 15° S 07° 05' E and one west of Colombo.

Successes achieved by these submarines were as follows:-

S.S. "SAMBRIDGE" sunk in the Gulf of Aden on November 18.

"SCOTIA" (Tanker) torpedoed in position 12° 20' N 04° 4' E.

S.S. "ATHENEA LIVANOS" torpedoed in position 12° 20' N 04° 4' E.

S.S. "FORT CAMOSUN" torpedoed in position 11° 21' N 46° 03' E on December 3.

Three Japanese and possibly one German U-boat were believed to be operating in the Indian Ocean during December, but no ships were reported attacked between December 3 and December 23. S.S. "PESHAWAR" was torpedoed on December 23 in position 11° 25' N 80° 30' E and the following day a U.S. vessel, "RIVER RAISIN" reported a U-boat attack in position 24° N 59° 12' E.

S.S. "ASIAN" was sunk off Cape Comorin and the S.S. "JOSE NEVARRO" was torpedoed off the west coast of India on December 28.

2. GERMAN ACOUSTIC TORPEDOES

There are indications that the German acoustic homing torpedo travels on a straight course for a distance of between 800 and 3,000 yards after being fired. Then the torpedo circles until it begins to home on the sound of a ship's propellers.

When the torpedo is under acoustic control, its speed is believed to be between 20 and 25 knots, the maximum running range of the torpedo being 10,000 yards. At the end of its run, the torpedo explodes (probably to prevent its recovery if it is caught in a net defence). The range of homing is probably about 500 yards, but may be as low as 200 in the case of a slow ship.

3. JAPANESE MIDGET SUBMARINE TACTICS

Although raids by Japanese midget submarines have in the past proved unsuccessful, the possibility of further attacks by midgets cannot be disregarded. As the Allied Forces move further north, it becomes necessary for ships to anchor in practically undefended harbours and even in open roadsteads. This gives the enemy a chance to employ his submarines with greater prospects of success than he has enjoyed in his attacks on closely defended ports.

The new situation calls for increased efficiency by all anti-submarine ships used to guard otherwise unprotected shipping at anchor.

Midget submarines detailed to attack Allied Shipping in harbour will be brought within range either by "I" Class submarines or in the holds of specially equipped ships. They will have hand-picked, well trained captains and crews whose offensive spirit is high.

The following notes, which were prepared from captured documents, summarise the experience and methods that will guide the midget's Captain in his offensive operations. Knowledge of his



11, 2, 3, 4

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Speed Surf.	Speed S/mged	Surface Endurance	Safe Depth
1955	320'	1-5.5" 1-.303"	4 bow 2 stn.	22	18.8 kts.	8.1 kts.	12,400' at 14 kts.	197'

15, 6

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Speed Surf.	Speed S/mged	Surface Endurance	Safe Depth
1955	320'	2-5" 1-.303"	4 bow 2 stn.	20	21.3 kts.	9 kts.	11,150' at 14 kts	262'

17 - 41, 1101 - 104

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Speed Surf.	Speed S/mged	Surface Endurance	Safe Depth
2200 (avge.)	360' (avge)	1-5.5" 2 or 4 smaller	6 bow	18-20	23.6 kts	8 kts.	14,000' to 16,000' at 16 kts.	327'

1121, 122, 123, 124  
(Minelaying Submarines)

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Speed Surf.	Speed S/mged	Surface Endurance	Safe Depth
1142	274'	1-5.5" 1-.303"	4 bow	12	14.8 kts.	6.4 kts.	12010' at 10 kts	219'



RO 26-28, 30-32

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Surf.	Speed S/mged	Surface Endurance	Safe Depth
655	243'	1-4.7" 1-.303"	4 bow	8	12.5 kts.	7.3 kts	6,600' at 10 kts.	148'

RO-60 - RO-68

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Surf.	Speed S/mged	Surface Endurance	Safe Depth
988	250'	1-3.15" 1-.303"	6 bow	12	15.1 kts.	7.8 kts.	6,000' at 10 kts.	197'

RO-33, 34

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Surf.	Speed S/mged	Surface Endurance	Safe Depth
700'	248'	1-3.15" 1-.5"	4 bow	8	18.8 kts.	8.3 kts.	11,000' at 10 kts.	246'

RO-57, 58, 59

Displacement	Length	Guns	Torpedo Tubes	Torpedoes Carried	Max. Surf.	Speed S/mged	Surface Endurance	Safe Depth
889	239'	1-3.25" 1-.25"	4 bow	8	17 kts.	9.2 kts.	4,500' at 10 kts.	197'



methods will enable Allied Commanding Officers to protect their own ships and ships they are called upon to provide with anti-submarine protection.

Japanese midget Commanding Officers have been instructed as follows.

#### "The Time for Attack

If a large ship or transport anchors, a resolute attack should be executed immediately. Attack by day or night, especially if the condition of moon and the weather are favourable.

Select a time of attack when the defence of the ship is most difficult, such as while she is unloading cargo.

When a report is received that a target has been discovered, attack with the least possible delay. Opportunity to attack is lost if a vessel escapes to sea or into a strongly defended harbour.

It is disadvantageous as regards replenishment of supplies and maintenance for the midget submarine to remain moored on the surface for a protracted period. From this point of view, the attack should be executed at the earliest opportunity.

#### Number of Midgets Participating.

Normally two midgets will be used against a large vessel. Four or more will not ordinarily be used at the one spot unless several ships providing suitable targets are in the one anchorage.

Only those midgets which have been recently supplied and overhauled will be used.

#### The Advance to the Attack

A time interval of ten minutes between midgets will generally be given for advancing.

When completely submerged, maximum depth will generally be maintained.

Take the shortest course to the target, and after completion of the attack follow a suitable circuitous route back to base avoiding counter-attacking craft with deceptive manoeuvres.

In the event of a counter-attack soon after launching, immediately flood tanks and submerge to a depth of 150 to 200 feet

or deeper, and take evasive action on a course which is at right-angles to that at the time of launching.

When there is no further danger of pursuit, return to the launching position and advance in the direction indicated upon launching.

The course depths for submarines attacking generally vary by 15 to 20 feet for each submarine, with the first submarine at a depth of 30 to 40 feet. Observations are to be made approximately every 30 minutes while on route. After completion of observations, submerge midget to the depth allotted and continue the approach.

#### The Attack

It is essential that the attack be carried out from a firing position sufficiently close to ensure a direct hit. The basic firing position is from 70° to 110° on the bow at 550 yards.

Generally the largest vessel will be attacked. If, however, the chance of discovery while getting into position is great, smaller vessels may be attacked. Rapidity of getting into position and attacking is important, as a delay may reduce the chance to attack because of counter measures or impede the attack of other midgets.

Patrol craft interfering in a midget attack are to be torpedoed if the situation warrants it.

#### Withdrawal and Return

After firing submerge quickly to maximum depth.

Midgets returning to a friendly base during the daytime will surface approximately a mile from the base and then enter harbour. At night a predetermined method of recognition will be used.

When it becomes impossible to return to base an attempt should be made to make a landfall in territory occupied by friendly troops. The midget should then be towed to the base as quickly as possible. Every attempt should be made to ensure that the midget does not fall into the hands of the enemy.

#### Communications.

After the midgets departure, the base will stand-by to receive messages. Midgets will select the proper opportunity to send messages, depending upon enemy situation. Frequencies used - 8,000 to 10,000 Kcs.



Prevention of Damage while waiting at Base

When it is probable that there will be an attack while moored at the base, midgets will submerge to the bottom. They will surface when there is no further danger of attack, but if the situation cannot be estimated from within the submarine then they will receive instructions for surfacing about one hour after submerging.

It may be necessary in some situations to remain submerged at the bottom daily from 30 minutes before sunrise until after dusk.

Each submarine commander should adjust the trim so that any one of the crew will be able to submerge to the bottom. It is essential to train the maintenance crew and the man attached to the submarine so that either is capable of submerging the submarine.

4. JAPANESE SUBMARINE STATISTICS

An estimate of Japanese submarine strength on December 7, 1943 - two years after the outbreak of the Japanese war - reveals that 42 submarines are considered to have been sunk while 64 U-boats were completed in that time. The enemy's submarines have increased in number from 74 to 96, but this increase has been entirely due to construction of small submarines.

Class	Displacement Tonnages	7.12.41	★ Lost	Completed	7.12.43
I	1955 to 2400	30	18	17	29
I-100	1142 to 1638	29	13	13	29
RO	655 to 988	15	10	11	16
RO-100	500	0	1	23	22
		74	42	64	96

5. JAPANESE RADAR

The following is the amplification of the information on Japanese Radar included in the November monthly report.

The main function of Radar on a frequency of 348 megacycles is probably surface warning although it will give a certain degree of air warning.

It is possible, however, that some sets fitted in Japanese submarines are primarily designed for air warning and these sets would give very limited results in detecting surface craft. It is unlikely that Japanese submarines would be able to detect an A.M.S. or P.C. at more than three miles.

It has now been established beyond reasonable doubt that Japanese submarine Radar frequency is 350 megacycles.

6. SPECIALLY-FITTED JAP U-BOATS

The following is an estimate of Japanese submarines which have been fitted for special purposes.

- (i) Submarines which have had their forward gun removed to enable them to carry aircraft are: I-7, 8, 9, 15, 17, 19, 21 and 23. Some of these have been sunk.
- (ii) Submarines which have had their after gun removed to enable them to carry midget submarines or landing barges are: I-2, 16, 18, 20, 22, 24 and possibly I-27 and I-29.

7. JAPANESE ASDIC METHODS

A Dutch submarine which recently attacked a Japanese ship escorted by a torpedo boat heard noises resembling Asdic transmissions. The transmissions were made at intervals varying from five to nine minutes and were of a very low frequency. Variations in the strength of the noises were similar to those resulting from a sweep.

The Japanese escort did not detect the submarine when, prior to the attack, it approached to 1,800 yards, neither did the



enemy hear the submarine when she passed at 18 knots five miles away. During the escort's sweep several good contacts were made at a range of 3,000 yards, but the Japanese ship gave no indication of having detected the submarine.

Impulses from echo-sounding gear were heard between the submarine's attack and the first depth charge explosions. An unescorted merchant ship, attacked on another occasion, counter attacked with depth charges although she did not appear to be fitted with Asdic. She used echo-sounding gear all the time, however.

SECTION VMISCELLANEOUS1. JAPANESE NAVY MINISTER'S REVIEW

The Japanese Navy Minister, Admiral Shigetaro Shimada, reviewed the naval war situation in the House of Representatives on December 28.

"The Imperial Navy is unrelentingly consolidating its strategic positions over a vast region covering all of Greater East Asia as well as the Pacific and Indian Oceans," he declared.

It was significant that the majority of Shimada's address was devoted to the naval air force which had carried out raids in the Indian Ocean, South West Pacific and Northern Pacific areas. He emphasized the Japanese "victories" in the sea battles and air battles off Bougainville Island during November when the Japanese "sank" a total of "11 aircraft carriers, eight battleships and 28 cruisers as well as numerous other vessels of various categories and in addition downed nearly 600 planes".

Shimada was more reticent concerning Japanese submarine activity but he lauded the "unceasing efforts by Japanese submarine forces which have succeeded in severing the enemy supply lines."

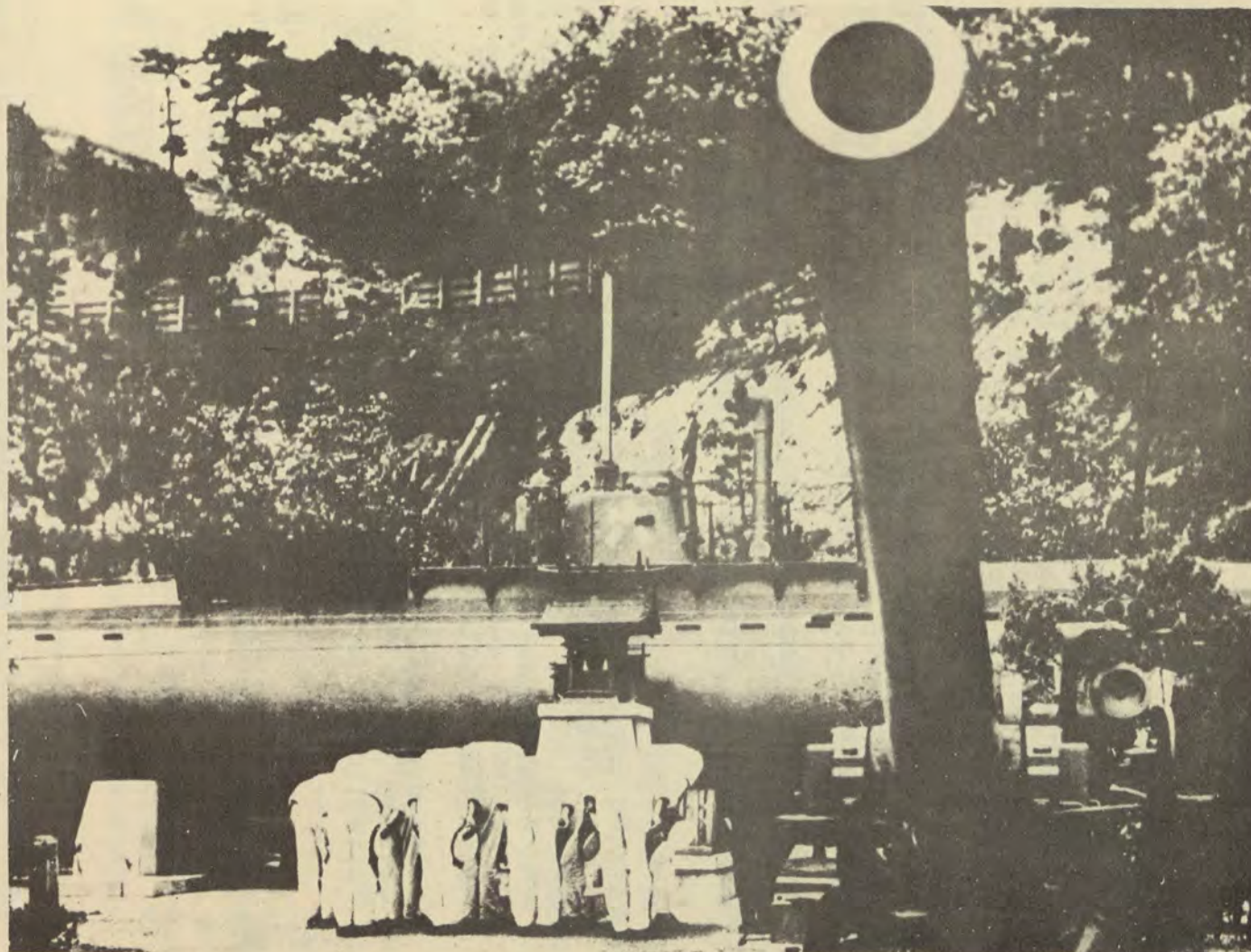
"Our undersea raiders accounted for 12 enemy vessels aggregating approximately 100,000 tons in the last two months, while our surface units are confirmed to have sunk 11 enemy submarines since October," Admiral Shimada added.

It is difficult to understand the object of these fantastic claims unless it is to offset the admitted reverses suffered in land fighting in New Guinea, the Solomons, the Gilbert Islands and New Britain. Admiral Shimada's claims for November and December include the following ships as sunk or heavily damaged: 24 aircraft carriers, 9 battleships, 51 cruisers, 15 destroyers, 11 submarines and 48 transports.

2. JAPANESE SUBMARINE CLAIMS

According to Tokio Radio, "quarters close to the Imperial



A SUBMARINE "HERO"

A submarine that sank with all hands while doing trials seems to be a strange relic to keep as an "inspiration" to future U-boat crews. However, the Japanese dedicated a Shinto shrine to this boat, and officers under training daily bow low in adoration. After all, the submarine DID return to its base!



Navy" have announced that Japanese submarines during the first two years of war sank 61 Allied ships, aggregating 1,253,000 tons and sank or heavily damaged 24 warships.

The announcer said "Details of the 24 enemy warcraft which were sunk or heavily damaged by our submarines follow:  
Sunk: One battleship, 4 aircraft carriers, 1 heavy cruiser, 1 light cruiser, 3 destroyers and 3 submarines. Total 13.  
Heavily damaged: Four battleships, 2 aircraft carriers, 1 heavy cruiser, 2 light cruisers, 1 destroyer and 1 warship of unconfirmed type. Total 11."

One of the battleships claimed as heavily damaged was of the Warspite class and was "torpedoed" in Sydney harbour. The majority of the other Japanese "successes" are equally fantastic.

### 3. AND ANTI-SUBMARINE CLAIMS

"Imperial naval warcraft and naval air forces have sunk 14 enemy undersea craft since October," Tokio declared recently.

A Japanese commentary on this announcement was as follows:

"A total of 161 enemy undersea craft have been destroyed by the Imperial navy and the army and navy air forces since the outbreak of the G.E.A. War, quarters close to the Imperial navy disclosed today.

"It was revealed that of the 14 submarines announced as sunk today, 4 were sunk in October, 5 in November and 5 in December. They said that the enemy submarines sent to their watery grave were either hit by our warcraft while cruising on the surface or when they rose to evade depth charges.

"They added that in the latter case the sinking was confirmed by oil rising to the surface for an extended period over areas extending over more than one square mile or other positive proofs following the dropping of our depth bombs. The same quarters expressed the belief that a still greater number of enemy submarines were actually sunk but not listed as sunk because the sinking was unconfirmed."



#### 4. SEA-PLANE CARRYING U-BOATS

A prisoner captured when "U-752" was sunk said that he had been temporarily drafted to "U-178" a 1,200 ton U-boat which was the first of its type to be altered to carry a seaplane.

The work of conversion to a sea-plane carrier was regarded as highly secret and only Naval technicians were permitted to carry out the alteration. Dockyard personnel were not employed and the work was not done in the U-boat shelters.

A pressure tight hangar was built abaft the conning tower and the after end of the hangar was closed by a water tight door secured in the same manner as those inside the U-boat. When the sea-plane was cleared away for launching the water-tight door was opened and the sea plane drawn out on rails.

The wings, which were collapsible, were then extended and the U-boat trimmed down aft to float the sea-plane. After the sea-plane had been turned and towed astern of the U-boat, which proceeded at full speed, the engine was run at full throttle and the aircraft took off.

The survivor said that the aircraft was only good for reconnaissance and was hardly more sturdy than a motor driven glider. It could not carry bombs, had no armament and carried only a pilot. Another dismantled sea-plane was said to be contained inside the pressure hull of the U-boat.

The Naval Intelligence Division of the Admiralty states that "pending confirmation, this report should be treated with great reserve. It is known however, that the Germans have been experimenting to discover some means of increasing the range of vision of U-boats."

#### 5. GERMAN MAN-POWER SHORTAGE

A German U-boat prisoner who had been in Kiel not long before he was captured said that the majority of the personnel of Germany's large surface units including "TIRPITZ", "SCHARNHORST" and "GNEISENAU" were being withdrawn and sent to the Russian Front. Only skeleton crews remained in the large warships.

A few days later prisoners taken from "U-202" corroborated the statements. They said that of the men withdrawn all who

are fit have joined the U-boat Arm. In addition it was stated that about 50% of Naval clerical personnel had been replaced by women. The men had been sent to Russia.

There is no confirmation of these reports, and, of course, "SCHARNHORST" put to sea and was destroyed at the end of December, but the statement coming from two U-boats based on different ports is significant if for no other reason than that it indicates that the Germans are aware of the great strain being placed on their man-power reserves.

#### 6. SUBMARINE LOSSES

October provided another record month in the U-boat war when 35 enemy submarines were sunk or probably sunk and Allied losses were only 15 vessels of 75,742 tons. Twenty-seven U-boats were sunk in the North-west Atlantic area and, of the others, one was sunk in the Indian Ocean and one in the South-west Pacific area. Aircraft were responsible for 26 of the sinkings, surface vessels for 7 and submarines for two.

Preliminary figures for November indicate that at least 12 U-boats were sunk or probably sunk. Seven more were destroyed during the first part of December.

#### 7. A.M.Ss'. SUCCESS

A recent Admiralty assessment includes a grading of "E" (probably slightly damaged) to an attack made by H.M.A.S. "WOLLONGONG" and H.M.A.S. "GERALDTON" on June 16 in the Mediterranean.

#### 8. AXIS MEETING IN TOKIO

Berlin Radio announced during November that representatives of Germany, Japan and their satellites had met in Tokio "to establish still closer co-operation." Among the Japanese puppet Governments represented were Thailand, Singapore and occupied China.



The meetings were preceded by a fanfare from Tokio Radio. The Japanese, apparently determined to impress her satellites (whose faith in the Rising Sun may be waning as a result of Allied successes) made fantastic claims of victories won by their aircraft. (In two air-sea battles off Bougainville early in November, Tokio claimed two Allied aircraft carriers, three battle-ships, four cruisers and five destroyers sunk. The Japanese claims between November 1 and November 10 mounted to 56 ships sunk and 78 damaged. Not satisfied with these modest victories, Tokio Radio then broadcast descriptions of further air-sea battles in which three aircraft carriers and five cruisers were claimed "instantaneously sunk.")

Apparently the other Axis powers were duly impressed with Japan's air might as both Berlin and Paris radios described the American "losses" as a "disaster even surpassing that of Pearl Harbour."

No Allied warships of any type were lost in the operations referred to by Tokio - Indeed, four of the "air battles of Bougainville" did not take place!

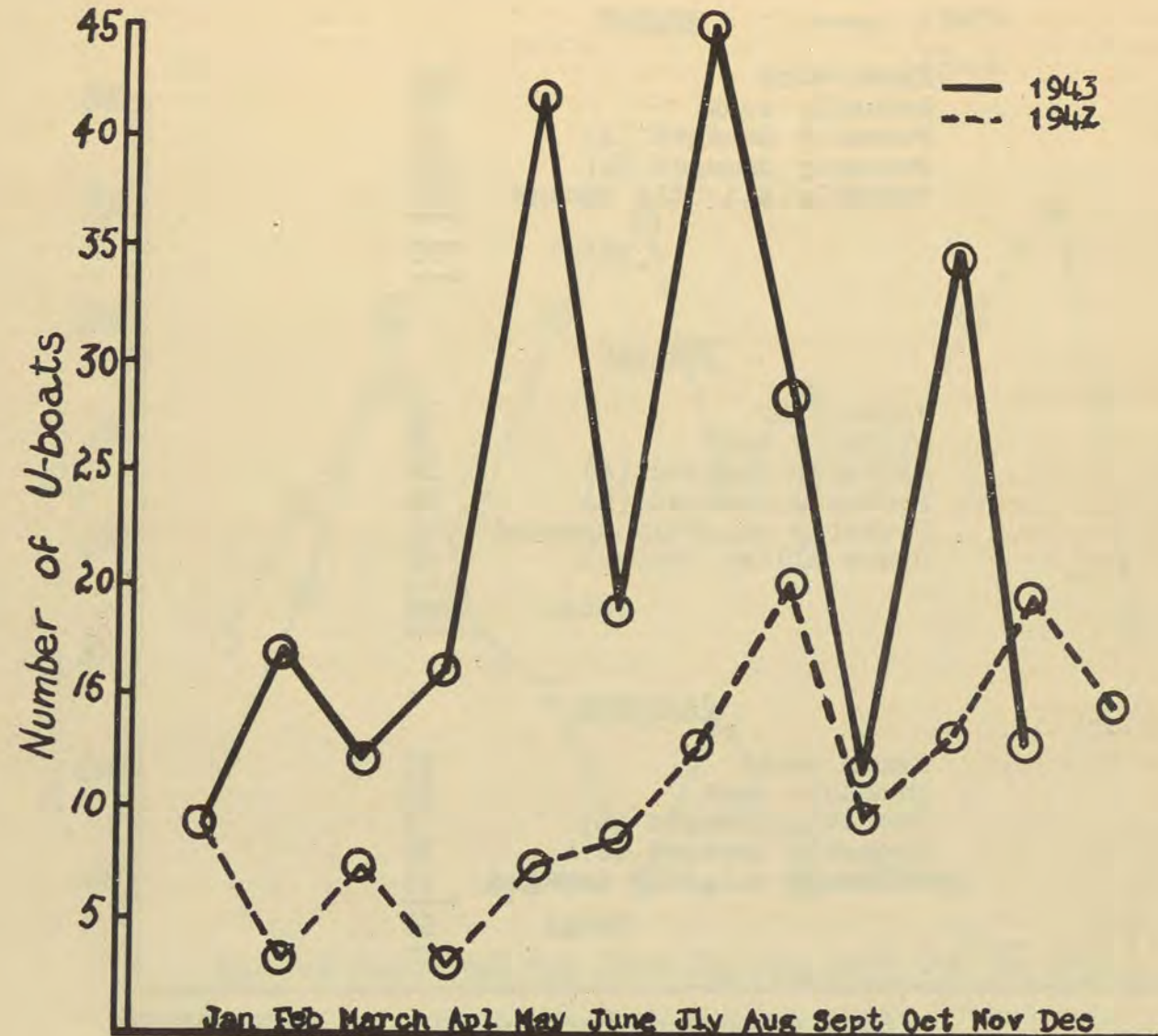
These claims are similar to one made by Tokio Radio early in November. Radio monitors at first thought they were mistaken but the announcement was repeated three times. Tokio said: "Of 200 anti-Axis planes attempting to raid Rabaul, we shot down 201."

9. JAPANESE SHIPPING

Japan's sea-going merchant fleet had been reduced by about 1,570,000 gross tons by October 1, 1943. In December 1941 Japan had 1495 ships of 1,000 gross tons and over and after 22 months of war 521 of these vessels have been sunk. This represents a reduction of 2,872,000 tons of Japan's peace-time tonnage of 6,370,000 gross tons.

New construction in Japan is estimated at 736,000 gross tons and in addition to this 517,000 gross tons of Allied and Axis shipping was seized after the outbreak of war. Thirty-five Japanese tankers have been sunk, but there is evidence to suggest that these losses have been offset to an important degree by diverting cargo vessels for the carriage of oil in bulk. Some cargo ships assigned to relieve the tanker shortage appear to have been converted into effective tankers.

AXIS SUBMARINE LOSSES - WORLDWIDE





10. AXIS SUBMARINE CASUALTIES

The following tables show the number of German, Italian and Japanese submarines sunk and damaged from 1939 until September 30, 1943. The totals are not quite complete, but include all but recent assessments.

GERMAN

Known sunk	207
Probably sunk	84
Probably damaged (A)	55
Probably damaged (B)	164
Probably slightly damaged	283
Total	<u>793</u>

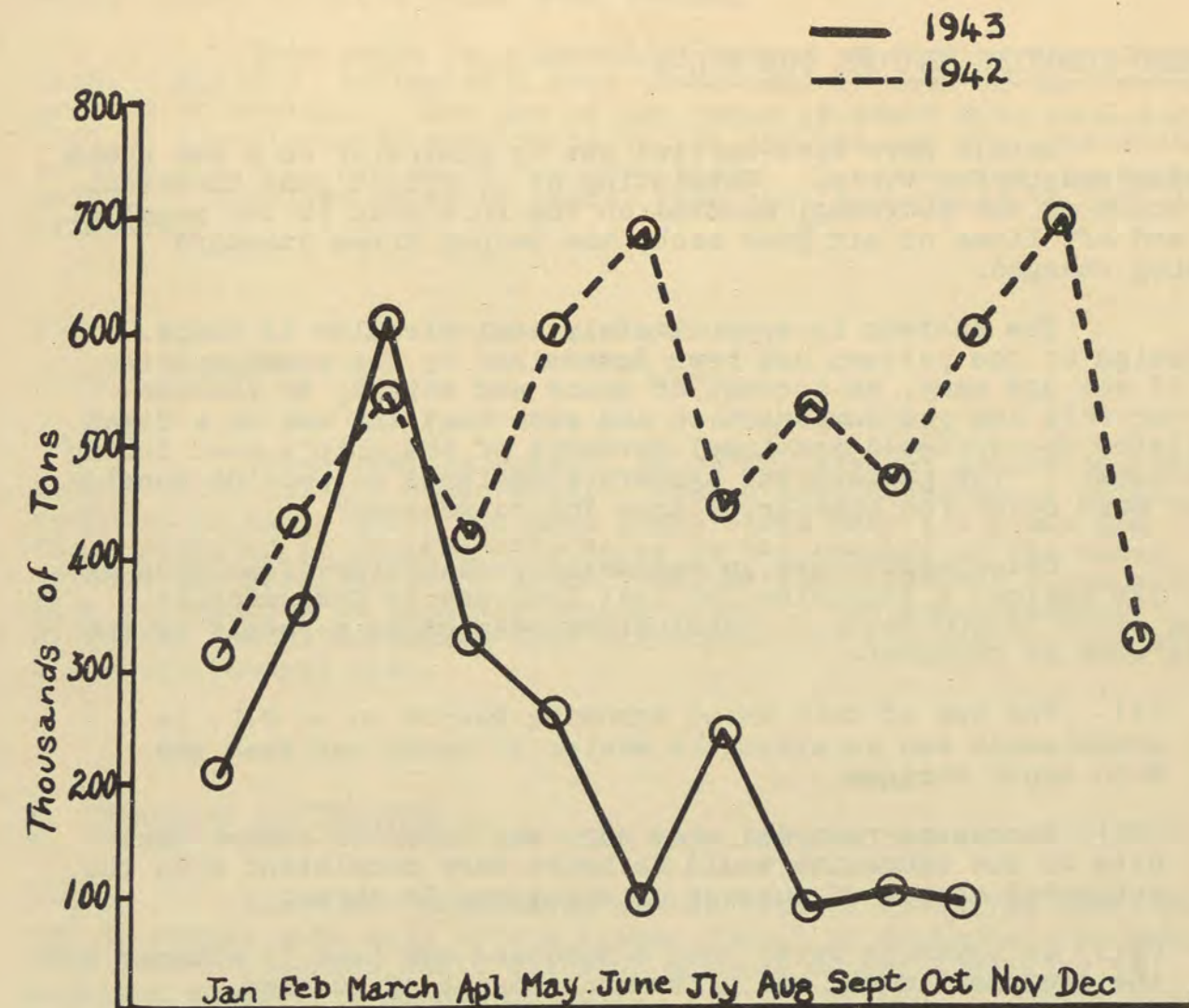
ITALIAN

Known sunk	72
Probably sunk	7
Probably damaged (A)	16
Probably damaged (B)	38
Probably slightly damaged	47
Under Allied Control	29
Total	<u>209</u>

JAPANESE

Known sunk	22
Probably sunk	11
Probably damaged (A)	2
Probably damaged (B)	16
Probably slightly damaged	15
Total	<u>66</u>

Some submarines have, of course, been damaged more than once and one U-Boat, "U-31" was twice destroyed. She was salvaged by the Germans after being sunk in Schillig Roads by aircraft of Bomber Command on March 11, 1940, but was destroyed by H.M.S. "ANTELOPE" on November 2.

ALLIED SHIPPING LOSSES - WORLDWIDE



SECTION VIMATERIEL1. AHEAD THROWING WEAPONS FOR M.L's

Trials have been carried out by Admiralty on a new ahead throwing weapon for M.L's. Consisting of 12 Spigot guns identical with those of the Hedgehog, mounted on the fore deck in two parallel fore and aft lines of six guns each, the weapon fires standard Hedgehog charges.

The pattern is approximately semi-circular in shape. The design of the pattern had been determined by the consideration that it was not easy, on account of space and weight, to provide gear for roll and yaw compensation and also that the use of a fixed oscillator necessitated continual movement of the ship's head during the attack. The pattern was therefore designed to provide considerably more cover for line error than for range error.

Calculation gave an estimated probability of hitting of about 31% against a submarine 200 feet long and 15 feet wide at depths of 50 to 300 feet. Conclusions reached as a result of the trials were as follows:-

- (i) The use of this ahead throwing weapon on an M.L. is practicable and an attack is easier to carry out than one with depth charges.
- (ii) Successes recorded when care was taken to ensure that hits on the submarine would be heard were consistent with the estimated chance of success of about one in three.
- (iii) In anything worse than a moderate sea (sea 3) attacks with the equipment would not offer much chance of success.

2. VERTICAL TIME SCALES FOR RECORDERS

Paper vertical time scales will be fitted to Recorders A/S 3 until the metal scales are received from Admiralty. The method of fitting the scales is as follows:-

Open the recorder cover and fit the scale so that the shaft of the arrow is in line with the horizontal red zero mark on the range scale. Fix the scale with a transparent gum so that the two back flanges are under the metal of the cover. Paste the printed part of the scale on to the glass. There is a piece cut out at the top between the arrow and the 30 second mark to permit clear vision of close range echo traces.

This scale is a secondary method of finding the time to fire. M.R.C.S. tables will have to be used if both of the Recorders are out of action. The use of the scale is dealt with in C.A.F.O. 1381/43 (particularly paragraphs 23, 24 and 25) and the provisions of this C.A.F.O. are to be complied with. C.A.F.O. 1437/43 also refers. Supplies of paper scales have been despatched to Port A/S Officers.

3. A/S SPARES

When ordering spares, ships are advised to use separate demand notes for A/S components. Cases have occurred of notes rendered by ships which included items other than A/S items and these resulted in considerable delay in the passage of the notes through the Naval Store. Items from the establishment lists should also be rendered on separate demand notes if the sub-heads are different, notwithstanding that all stores are included in the one A/S establishment list.

4. CHANGE OF OSCILLATORS

M.L's are continuing almost without exception their failure to comply with Navy Office letter 050125 of September 17, 1942. This letter requires particulars of changes of oscillator to be supplied whenever a change is made. Notification of change should be made to H.M.A.S. "RUSHCUTTER" and Naval Board by signal in Confidential Code, or by Secret letter.

5. SUMMARY OF HEDGEHOG ATTACKS

A summary has been made by Admiralty of Hedgehog attacks carried out between December, 1941, and July, 1943. The Hedgehog was first fitted in H.M.A.S. "WESTCOTT" in December, 1941, but



premature explosions and numerous misfires at first caused many disappointments and it was not until November, 1942, that H.M.S. "LOTUS" obtained a first kill.

Since January, 1943, more improvements have been made in ammunition and five successful attacks were achieved in the period April - July.

During this latter period, 73 Hedgehog attacks were made of which 47 were graded "U-Boat present". Of these attacks only 36 were made under reasonable conditions (sea below 4-5). In 8 of these attacks there were serious technical failures.

Five submarines were destroyed by these attacks, giving a percentage of success on all attacks of 11 per cent. Eighteen per cent of attacks on U-Boats in reasonable conditions and with no serious material failures were successful.

#### 6. EFFICIENCY OF DEPTH CHARGE ATTACKS

An examination has been carried out of the efficiency of depth charge attacks made by British ships in the first two quarters of 1943. The object of the investigation was to compare results obtained before and after the instructions for increasing the spacing of depth charges (April, 1943). Other factors beside the spacing of patterns are likely to have effected the efficiency of attacks and no attempt has been made to distinguish between these possible causes of improvement.

The following table gives the number of depth charge attacks per U-Boat sunk or probably sunk for each month. Hunts in which the Hedgehog was also used, but in which it inflicted no damage, have been included. Other Hedgehog hunts, attacks with patterns of less than three depth-charges and attacks on probable "non-sub." targets have been excluded.

Number of Hunts		Kills		D/C Attacks		No. of Attacks per Kill.	
Jan. 15	Apr. 28	Jan. 2	Apr. 3	Jan. 33	Apr. 45	Jan. 16	Apr. 15
Feb. 30	May 45	Feb. 5	May 7	Feb. 79	May 119	Feb. 16	May 17
Mar. 34	June 9	Mar. 2	June 4	Mar. 72	June 37	Mar. 36	June 9
Total 79	82	9	14	184	201	20.4	14.3

#### 7. C.A.F.O's ON A/S SUBJECTS, 1943

C.A.F.O.	Subject	Brief Description	Work By
1974	Type 132	Spares for Rotary Converters	S.S.
1975	Type 134A	Lifting Tube Modification	B.S.
1976	Depth Charges	Firing 5-Charge patterns	S.S.
2011	Elliptical Targets	Reports	B.S.
2047	Raft Stops	Spares	S.S.
2049	Installation	"Instructions for Installing" - Circulation	B.S.
2112	Merchant Ships	List of Ships fitted with Asdic	B.S.

S.S.-Ship's Staff

B.S.-Base Staff

The following should also be noted where they apply:-

1808, 1815, 1816, 1817, 1819, 1878, 1879, 1880, 1881, 1883, 1927, 2048.



U.S. AIR FORCE

OFFICE OF THE CHIEF OF STAFF

WASHINGTON, D. C.

15 FEBRUARY 1951

MEMORANDUM FOR THE RECORD

SUBJECT: [Illegible]

[Illegible text follows, including a list of items and a summary section.]

