

U.S.S. RAZORBACK (SS394)
Care of Fleet Post Office,
San Francisco, California.

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~~RESTRICTED~~

From: Commanding Officer.
To : Chief of Naval Operations.
Via : (1) Commander Submarine Division TWELVE.
(2) Commander Submarine Squadron ONE.
(3) Commander Submarine Force, U.S. Pacific Fleet.
(4) Commander in Chief, U.S. Pacific Fleet.
Subject: USS RAZORBACK (SS394) - Report of Simulated War Patrol No. 3
Reference: (a) ComSubPac letter serial 753 dated 11 April 1949
(SubPac X-44).
Enclosures: (A) The Report.
(B) Track Chart (ComSubPac only).

1. In accordance with reference (a), enclosures (A) and (B) are forwarded herewith as the report of this vessel's third simulated war patrol conducted in the Marianas - Japan - Philippines area from 19 July to 21 October 1949.

Jim D. Miller
JIM D. MILLER

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REPORT OF SIMULATED WAR PATROL NO. THREE

R-E-S-T-R-I-C-T-E-D

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ANNEX A - ASW and Submarine Evasion.

ANNEX B - Report of Operations with British Naval Units.

Cover Sheet

Enclosure (A)

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(A) NARRATIVE

19 to 31 July. Enroute Pearl Harbor, T.H., to Guam, M.I.

At 1500 W Tuesday 19 July, RAZORBACK departed Submarine Base, Pearl Harbor, enroute Guam, I.I., in accordance with ComSubPac Operation Order No. 11-49. During the first night ran on a steady course with ship lighted in order to clear the Hawaiian area prior to commencing simulated war cruising conditions.

At 2228 X made SV radar contact on large ship ahead at range 25 miles. Ship passed abeam to starboard at 2252 X, range 4.5 miles; appeared to be a large transport or commercial passenger vessel.

At dawn 20 July placed into effect simulated war cruising conditions. Commanding Officer issued standing written instructions based on the "Patrol Hints" given in Chapter IX of USF 64, modified as necessary to meet peacetime safety restrictions. The training was excellent. There were sufficient ship contacts to keep watch-standers alert, but only one aircraft was sighted during the whole voyage, and that just as we were approaching Guam. All aircraft contact dives had to be made as drills. Six ship contacts were established. All were avoided.

0000 X 21 July SV contact on ship bearing 265T range 23 miles. Tracked in course 265T at 8 knots. Made end-around during darkness.

0500 X 21 July SV contact on ship bearing 260T range 14 miles. Developed into three small freighters on an easterly course at slow speed. Avoided to the south and west.

1207 L 27 July lookout sighted ship mast bearing 260T range 10 miles. SS radar made contact immediately. Identified as tug towing two drydock sections. Tracked on course 085T speed 5 knots.

0035 K 29 July SS radar contact bearing 270T 14 miles on opposite and parallel course. Opened to south to avoid.

1804 K 30 July SS radar contact bearing 180T range 9.5 miles. Identified as small tanker with tow.

0300 K 31 July SS radar contact on large ship bearing 090T range 25 miles. Lost contact at 0335 on bearing 106T range 61,000 yards.

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The Pearl-Guam passage was used to give the ship its initial shake-down. With the weather cooperating to the fullest, we were able to make enough speed while cruising on the surface to keep ahead of our required position, and thus have ample time for daily drill periods. Except during engineering exercises a dive was made on each watch during the day followed by a battle problem, a damage control problem, or deep submergence with drill at ship handling submerged including hovering.

All required engineering exercises were completed during this period.

On 27 July reported to ComNavwesPac for operational control.

On Saturday, 30 July, made a twelve hour dive. Thirty pounds of CO₂ absorbent were used, fifteen pounds in each torpedo room. CO₂ concentration in the atmosphere at the end of the dive was 0.7%. During the dive the ship was taken to test depth and checked for tightness, two hours were spent hovering while conducting a sonar survey of internal machinery noises, high speed depth control and hovering were practiced each watch, emergency drills were held, and one dummy torpedo approach was made. As a submarine interest stimulator all new recruits were called to the conning tower to look through the periscope at Guam and Rota Islands.

At 0800 K Sunday, 31 July, RAZORBACK entered Apra Harbor, Guam.

31 July to 4 August. At Guam providing ASW target services under the operational control of ComFair Wing ONE (CTF 75).

The reception in Guam was excellent. Representatives were on hand to make arrangements for all needed services and recreation facilities. The UTU Guam Operations Officer delivered our operation order for the coming week and explained what services would be expected.

During forenoon on Monday, 1 August, Commanding Officer made calls on Capt. W.J. Suits, Commandant, NOB, Guam; Capt. M.J. Drury, ComFleTraGru, WesPac; and Cdr. Seipt, Com UTU, Guam.

Was informed by ComFair Wing One Operations Officer that no calls were expected by that command.

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At 1400 K 1 August the pre operations conference was held at UTU Guam. Arrangements were made for continuous day and night operations starting the morning of 2 August and lasting until the afternoon of 4 August. Submarine torpedo firing exercises were scheduled as requested with an AKL and a PCE being made available as targets. Cooperation in this respect was everything that could possibly be desired.

2 to 4 August underway in operating area off Guam. During each forenoon, 0930-1200, conducted exercises Y-81-AW and Y-83-AW with VP 42 aircraft. During each night, 1900-0100, conducted exercises Y-81-AW and Y-89-AW with VP 22 aircraft. None of these exercises required any evasive efforts on the part of the submarine; however, on three occasions during the last 15 minutes of a sonobuoy exercise one M/C noisemaker was ejected according to previous arrangements to determine what, if any, effect it would have. Results were negative.

On the afternoon of 2 August LTJG KERR, Engineer Officer, fired one S-2-G practice. Target was USS HEWELL (AKL 14). Result--hit. On the following afternoon LTJG J. E. BONDS, Gunnery Officer, fired the same practice, same target but escorted by PCE 898. Results--undetected approach and hit. Torpedoes in both cases were recovered by RAZORBACK with assistance of motor whaleboat furnished by Hewell.

On 1 August RAZORBACK had sent a dispatch request to ComNavWesPac for permission to make a photo reconnaissance of Pagan Island while enroute Guam to Yokosuka. Pagan Island, with all its old Japanese military installations had prospects of being a very interesting photographic subject. The answer to this request indicated that there would not be time to make the reconnaissance. As a matter of fact, since we were wanted in Yokosuka on 8 August we would have to depart Guam ahead of schedule. Made plans to leave at sunset 4 August. On completion of the ASW exercise at noon that day, returned to Apra Harbor. The ASW critique was held at 1400 K.

Released by CTF 75 by dispatch as quoted: "ASW COMPLETED X YOUR EXCELLENT SERVICES APPRECIATED X SAIL ACCORDANCE BASIC INSTRUCTIONS"

RAZORBACK departed Guam at 1900 K, 4 August 1949.

4 to 8 August. Enroute Guam, M.I. to Yokosuka, Japan.

On 6 August reported to ComNav FE for operational control.

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The passage from Guam to Yokosuka was made at four engine speed on the surface all the way. We were hitting for a 15 knot speed of advance and an ETA 1300 K 8 August. With smooth seas we were able to beat that SOA and arrived four hours early. Only one ship contact was made, a tanker on an opposite and parallel course, detected by SS radar bearing 030T range 16 miles at 1005 K 5 August. Entered Tokyo Bay at 0430 K 8 August in a heavy low haze with occasional patches of thick fog. The hundreds of fishing boats dotted over the whole bay made the going even slower, although the navigation itself, with good radar traces of the shore line and fathometer soundings which checked against the chart, was not difficult.

At 0848 K 8 August RAZORBACK moored bow and stern in a destroyer mooring in the inner harbor at Yokosuka. While not an ideal mooring for a submarine, it served very well as long as no pier space was available. The ship was secured at the bow with three doubled manila mooring lines and at the stern with a single part of 1 $\frac{1}{4}$ wire cable furnished by Commander Port Facilities, Yokosuka.

On arrival Yokosuka further reported to Commander Support Group, Naval Forces, Far East, for operational control as directed by ComNav FE.

8 to 28 August. At Yokosuka, Japan, providing ASW target services to destroyers of DesRon Five and conducting other exercises as scheduled.

During forenoon of 8 August Commanding Officer made calls on RADM. J.P. WOMBLE, Jr., ComSupGru NavFor FE (CTG 96.5); RADM. T.H. BINFORD, ComCruDiv 1, in his flagship MANCHESTER; and Captain R.W. CAVENAGH, ComDesRon 5. During the afternoon attended two pre-operations conferences: the first on board the MANCHESTER conducted by RADM BINFORD and Capt. I.H. NUNN of MANCHESTER concerning combined operations scheduled for the week beginning 15 August; and the second on board the destroyer DUNCAN conducted by ComDesRon 5 concerning ASW exercises for the coming week starting 9 August.

From 9 to 12 August operated in area at sea to east of Tokyo Bay with DUNCAN and PERKINS of DesDiv 52 and ROAN, MCKEAN, GURKIE, and HENDERSON of DesDiv 51. Conducted exercises Y-30-AW, Y-41-AW, and Y-52-AW. Sonar conditions were extremely poor. The average B/T trace showed a sharp negative gradient (6° drop) between 80 and 100 feet, sometimes much sharper and shallower. By agreement at the pre-operations conference the submarine was to remain above the density layer. That agreement was fine, but had to go by the board in a few cases when the layer started at 40 feet with a 4 or 5 degree drop down to 80 feet. In close to the coast (10 to 15 miles) where the

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Kuroshio was especially active the temperature at one depth would vary several degrees. Submarine depth control was difficult and destroyer sonar search was ineffective.

At 2135 K 12 August RAZORBACK anchored in Yokosuka inner harbor. The following morning after daylight moored to assigned berth alongside BLUEBIRD.

13 and 14 August in Yokosuka for liberty and recreation. Facilities for enlisted men are excellent. With the local EM club a big center of attraction, and curio shops, and Yokohama and Tokyo easy train rides away, we found absolutely no takers for any organized recreation parties.

Orders to get underway on 15 August cancelled to wait for typhoon "Judith" to pass clear. Typhoon was scheduled to pass over Sasebo area on this date. Secured ship with extra lines in case any increased winds hit Yokosuka.

At 1000 K on 16 August with typhoon Judith passing clear over the north part of Kyushu got underway in company with BLUEBIRD proceeding toward rendezvous position off SHIONO MISAKI on the southern tip of Honshu for the first phase of the combined operations being carried out under the direction of ComCruDiv 1. At 0900 K the following morning made the rendezvous for scheduled ASW exercises, but with the whole area covered with a blinding rain storm, and with no sign of relief after 2½ hours, the OTC cancelled operations. RAZORBACK and BLUEBIRD returned to area south of Sagami Nada.

Starting at dawn 18 August ran through three S-2-G firings with BLUEBIRD as target and torpedo recovery vessel to complete the required torpedo approaches for LTJG JOHNSON, Damage Control Assistant, LTJG TRAVERS, Communication Officer, and ENSIGN DICKEY, Commissary Officer. At 1000 K released BLUEBIRD to return to Yokosuka for upkeep. RAZORBACK remained in same general area conducting ISE.

At dawn 19 August took course for initial point for Event 21 according to the combined operation schedule for the week. This event called for the submarine to make a submerged torpedo approach on a task force defended by both surface and air A/S screens. The submarine knew the starting point and base course of the task force; the latter knew only that the submarine was to attack sometime within a certain four-hour period. On station at 1200 K. Radar contact at 1245 K. Dived and commenced approach at 1248 K. Target group consisted of USS MANCHESTER (CL 83) screened by eight destroyers

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placed in an interrupted circular screen, and one Sunderland seaplane. At 1400 K completed the attack and surfaced. Exercise completed.

At 0625 K, Saturday, 20 August moored outboard of BLUEBIRD in Yokosuka. Transferred three torpedoes from BLUEBIRD to RAZORBACK.

20 and 21 August, Saturday and Sunday, in Yokosuka for liberty and recreation.

From 22 to 25 August provided ASW target services to destroyers of DesDiv 51 in operating/at sea to the east of Tokyo Bay. Conducted same exercises as before under same adverse sonar conditions.

Returned to Yokosuka Thursday afternoon, 25 August. That evening all officers not on duty attended the farewell dinner-dance given by Commander Port Facilities Yokosuka in honor of WADM R.S. BERKEY who was being relieved as ComNav FE to proceed to his new assignment as ComSeventh Task Fleet.

26 to 27 August, Friday and Saturday, in Yokosuka for liberty and recreation and limited upkeep. Put forty Japanese laborers to work cleaning and painting superstructure. Their work was very thorough. In a week's time these laborers should be able to put a submarine superstructure in tip-top shape.

RAZORBACK's stay in the Yokosuka area was very pleasant. All services requested were given quick and cheerful attention. The attitude of all personnel of the Port Facilities Command was one of cooperation and helpfulness and was most sincerely appreciated.

Released by ComNav FE by restricted dispatch address action.

RAZORBACK and BLUEBIRD quoted as follows: "WHEN RFS 28 AUG PROCEED TO SUBIC IN COMPANY ETA 2 SEPT X ON CROSSING 29 NORTH REPORT TO CTG 70.5 FOR OPCON X MAKE WEATHER AND MOVEMENTS X COMMUNICATIONS USE 70B X YOUR EXCELLENT SERVICES THIS AREA GREATLY APPRECIATED".

RAZORBACK and BLUEBIRD departed Yokosuka in company at 0600 K Sunday 28 August.

28 August to 2 September. Enroute Yokosuka, Japan, to Subic Bay, P.I., in company with BLUEBIRD.

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Excellent weather characterized most of this passage just as it had the Pearl-Guam and Guam-Yokosuka trips. Since the SOA required three engine standard speed, not too much time could be spent on practice approaches and tracking. Daily routine was to start at 0400 opening out on BLUEBIRD at four engine speed. At 0800 dived for practice S-4-G with initial range 16,000 to 20,000 yards. On completion of approach BLUEBIRD continued on base course while RAZORBACK ran silent at deep submergence and tracked BLUEBIRD out until sonar contact was lost. Average range on surfacing was 13 miles.

During afternoons RAZORBACK acted as target for BLUEBIRD's pointer and trainer drill. Also held daily visual signal drills including one in which both ships maneuvered around like battleships with BLUEBIRD calling the signals by flag hoist.

On the evening of 30 August ran through one night time practice S-2-G.

Intentions were to make one S-4-G firing run on the day before arriving Subic, but with squalls and choppy seas blowing up as we passed through Balintang Channel, the firing had to be called off.

Four SS radar contacts were made on ships:

At 0240 I 20 August bearing 215T range 16.5 miles. Tracked on course 055T speed 13.5 knots.

At 1247 I 29 August bearing 229T range 19 miles. Tracked on course 280T speed 9 knots.

At 2341 H 1 September bearing 214T range 5 miles. Was not tracked.

At 0119 H 2 September bearing 177T range 22 miles. Tracked on course 043T speed 8 knots.

On 29 August made report for operational control to CTG 70.5 for both RAZORBACK and BLUEBIRD.

Arrived Subic Bay at 1256 H, Friday, 2 September.

2 to 30 September. In the Subic Bay Area providing ASW target services to DesDiv 32.

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During afternoon of Friday 2 September Commanding Officer made calls on Captain J.B. Davidson, Commanding Officer Naval Station Subic, and Captain L.C. Quiggle, ComDesDiv 32 and CTG 70.5.

Saturday forenoon, 3 September, held pre-operations conference. Tentative plans were laid out for the whole four weeks of ASW training and details were covered for the first week. All submarine exercises requested were scheduled. ComDesDiv 32 and ComJTU China were most cooperative in this respect.

On Sunday morning 4 September ComDesDiv 32 returned the call made by the commanding officer.

ASW training operations started Monday 5 September. The four weeks schedule as laid out called for progressive intensification of effort and increase in difficulty of problems. DesDiv 32 had gone through considerable ASW training and was ready for advanced work. The first week was spent on elementary exercises for refresher training and for completion of competition and ORI's. The second and third weeks were devoted to test and evaluation of various systems of two and four ship coordinated search and attack, while the fourth week was spent in advanced exercises involving both destroyers and aircraft. Full evasion was called for after the first week. The burden in this case was on the submarine entirely. B/T traces were consistently isothermal; sound conditions were excellent. Our evasive tactics then involved the maximum use of radical maneuvers, noise makers, and decoys. The destroyers claimed that our efforts were very effective and gave them lots of trouble, but the RAZORBACK was mighty glad that the whole thing was just game and that the destroyers were not dropping real depth charges.

5 to 9 September—daily operations out of Subic Bay. On Monday afternoon, the 5th, RAZORBACK made a practice approach on USS ST. PAUL (CA 73) proceeding from Manila Bay to Subic and screened by four destroyers of DesDiv 32. Succeeded in penetrating screen and simulated launching ten torpedoes at cruiser.

On the evening of the 5th all officers not on duty attended the welcoming dinner dance given by the Commanding Officer, Naval Station Subic, in honor of VADM R.S. BERKEY who had just relieved as Com Seventh Task Fleet.

On Tuesday and Wednesday, 6 and 7 September, conducted exercise Y-41-AW with DesDiv 32 ships and assisted on ORI for USS MASON. On Thursday 8 September spent the forenoon continuing Y-41-AW exercises. During afternoon commanding officer fired one S-3-G practice with ST. PAUL as target screened by DesDiv 32 and one PBM aircraft. We were detected by USS FLECHTER, in the No. 3 position in the bent

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line screen, and fired one torpedo at the destroyer as he closed for attack. After completion of the S-3-G fired one S-4-G with BLUEBIRD as target.

Friday, 9 September, continued Y-41-AW exercises and assisted in ORI for USS ISBELL.

Spent the weekend 10 and 11 September moored alongside Alava Pier, Subic Bay. Liberty in Olongapo had little to offer, but for a short stay the sights at least were interesting.

On Sunday opened ship for visiting by Naval Station personnel.

During the working week 12 to 16 September operated with DesDiv 32 in testing and evaluating four-ship coordinated search and attack plans. Two five hour exercises, one during daylight and one during darkness were conducted each day. Off periods were allotted to RAZORBACK for conducting ISE or submarine exercises as desired.

On Tuesday morning, 13 September, conducted exercise S-4-S (photographic reconnaissance) using the north shore of the entrance to Subic Bay as target. Three rolls of film turned out bad, and the whole reconnaissance had to be repeated later.

Following the photo reconnaissance LTJG TRAVERS, Communication Officer, fired an S-2-G practice with BLUEBIRD as target for a hit.

On Wednesday afternoon, 14 September, FECHTELER and BLUEBIRD were assigned as submarine targets. The Executive Officer fired an S-5-G practice, using two torpedoes to obtain one hit on each target. The Gunnery Officer, LTJG BONDS, fired an S-2-G for a good hit.

After completion of ASW exercises at 1300 H Friday, 16 September, RAZORBACK proceeded with ComDesDiv 32 in RUPERTUS and BLUEBIRD to Sangley Point, Manila Bay, for weekend anchorage. At 1718 H moored alongside USS KIRSTEN (AF 34) anchored in Berth ABLE, Sangley Point. Being moored alongside another ship in this case turned out to be very convenient for purposes of boating and supply of required services.

17 and 18 September at Sangley Point. Granted overnight liberty to crew for Cavite and Manila.

On Saturday morning, 17 September, Commanding Officer called on RADM F.P. OLD, ComNavPhil, whose headquarters are located at the Naval Station, Sangley Point.

19 to 23 September operated with DesDiv 32 in testing and evaluating two ship coordinated search and attack procedures. One

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submarine torpedo firing exercise, an S-3-G, scheduled for Tuesday afternoon, 20 September, had to be cancelled because of seas too rough to permit recovery.

ASW exercises were completed early, 0930 H Friday the 23rd, in order to permit destroyers to participate in other exercises with ST. PAUL. Took advantage of the time available and the excellent photographic weather conditions to run a repeat of exercise S-4-S. After completion of the reconnaissance proceeded with BLUEBIRD to weekend anchorage at Sangley Point.

23 to 25 September at Sangley point. Granted crew overnight liberty to visit Cavite and Manila.

On Friday evening, 23 September, all officers attended a cocktail party given in honor of DesDiv 32 by Commander Philippine Naval Patrol at the Philippine Naval Officers Clubhouse in Manila.

At 0900 Saturday, 24 September, the operations conference to discuss details of the following weeks exercises was held on board the USS FLOYDS BAY (LVP 40) at Sangley Point. Units involved in these exercises were: All ships of DesDiv 32, RAZORBACK, BLUEBIRD, FLOYDS BAY, Patron 22 and Patron 42.

26 to 29 September advanced ASW exercises.

Departed Sangley Point at 0400 H Monday morning, 26 September in formation with DesDiv 32 and BLUEBIRD. On clearing Manila Bay proceeded independently to initial point for first exercise starting at 0900 H. For a straight 30-hour period two-hour plane-destroyer coordinated exercises to track and hold down the submarine were conducted every alternate two hours. Four hours after the last of these exercises a six-hour Y-91-AW was started. The pace was terrific for the submarine but from comments brought out at the critique it was even harder on the destroyers. No difficulty was encountered keeping the boat ready to dive at all times. By jamming ampere hours between each exercise the battery charge was kept well up.

The week of advanced ASW exercises was concluded with one Y-97-AW modified to reduce the distance to be covered by the submarine from 300 to 125 miles and the time from 55 hours to 16 hours. RAZORBACK succeeded in reaching the convoy point within the required time without being detected.

On completion of ASW exercises Thursday afternoon, 29 September returned to Subic Bay for critique and final logistics prior to departure from Philippine Area.

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ComDesDiv 32 held critique of advance ASW exercises at 0900 H to 1200 H 30 September.

At 1400, 30 September, CTG 70.5 (ComDesDiv 32) released RAZORBACK from his operational control by dispatch as quoted: "AT 301400H CONSIDER YOURSELF DETACHED FROM TASK GROUP 70.5 X COMPLY COMSEVENTHTASKFLT 250201Z NOTAL X YOUR EFFORTS HAVE RESULTED IN THE ASW ABILITY OF TASK GROUP 70.5 BEING RAISED TO A NEW HIGH AND YOU LEAVE WITH THE DEEP RESPECT OF ALL WHO HAVE BEEN YOUR ASW QUOTE OPPONENTS UNQUOTE."

At 1800 H Friday, 30 September, RAZORBACK departed Subic Bay for Hong Kong. The short passage, a night, a day, and a night, was made on the surface all the way with weather clear and sea calm.

30 September to 2 October. Enroute Hong Kong. 2 to 6 October. At Hong Kong for liberty and recreation.

Arrived Hong Kong at 0846 I Sunday morning, 2 October. Moored alongside U.S.S. GARDINERS BAY (AVP 39). Granted crew liberty and permitted selected Chinese merchants to come on board and display their wares on the topside deck.

At 1000 I received boarding officer from H.M.S. BLACK SWAN. He supplied considerable information on the port and city of Hong Kong and extended an invitation to the wardroom officers to come on board the BLACK SWAN for cocktails at noon. The invitation was enthusiastically accepted.

During Monday morning, 3 October, the Commanding Officer made calls on Vice Admiral Madden, Flag Officer Second in Command, British Far Eastern Fleet, and Commodore Brownfield, Commodore-in-Charge, Hong Kong.

On the morning of 3 October the typhoon OMBLIA which we had been watching anxiously as it approached from east of the Philippines began curving toward Hong Kong. British authorities advised clearing the harbor. Recalled all men from liberty and made preparations to get underway. At 1700 I with no change in the direction movement of the typhoon, got underway in order to clear harbor prior darkness. Ran south in company with GARDINERS BAY until noon the following day, 4 October, then headed back to the north to return to Hong Kong. Arrived Hong Kong at 1440 I Wednesday, 5 October.

After we had departed Hong Kong the typhoon had curved to the north and no high winds at all had been experienced in Hong Kong

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Harbor. Nevertheless, two days had been spent at sea which might much better have been spent enjoying the sights of Hong Kong. The crew of the RAZORBACK had little good to say about one typhoon named OMELIA.

However, all hands had at least one day ashore, all saw much of the ways and customs of the Chinese, and all made many good purchases of Chinese art goods. The side trip to Hong Kong definitely was interesting and was worthwhile.

At 1800 I Thursday, 6 October, departed Hong Kong for Pearl Harbor via Midway.

6 October to 16 October. Enroute Hong Kong to Midway.

During the first night out from Hong Kong heavy head seas slowed us down to about eleven knots, but after that the weather and seas improved and were excellent for the remainder of the voyage.

With our SOA set at 14 knots there was little time for drills. The training program during the passage to Midway and on to Pearl was concentrated on completing the qualification of all members of the crew.

On 13 October reported to ComSubPac for operational control.

16 October was repeated on crossing the International Date Line.

At 1405 Y, 16 October, moored at the Submarine Base, Midway Island. Received 15,000 gallons diesel fuel, 3,000 gallons fresh water, and fresh provisions including one large island-caught Tuna.

RAZORBACK met a very hospitable reception at Midway. During overnight stay the crew played one softball game, Chiefs were invited to a fish fry at the CPO Club, and all officers not on duty were entertained at dinner by the Commanding Officer, Submarine Base, Midway, LT. H.W. CHELLEW, USN.

Lack of mail at Midway was a disappointment.

Departed Midway in the very finest of weather at 0900 X, Monday, 17 October.

17 to 21 October. Enroute Midway to Pearl Harbor.

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(B) MATERIAL

(1) Hull and Machinery

(a) PERISCOPES.

Both periscopes were packed with Chevron packing by the Pearl Harbor Naval Shipyard. Number two periscope was entirely satisfactory throughout the patrol but number one periscope leaked excessively at the start of the patrol. On 1 August the periscope was honed and an extra ring of chevron packing installed. This resulted in an improvement but the periscope was not entirely dry. On 10 September the periscope was again honed and all packing renewed. Performance since then has been excellent.

(b) COMPENSATING WATER SYSTEM.

While submerged on 15 September the compensating water line sprung a leak in the control room outboard of the hydraulic manifold. The leak was temporarily repaired by using 5/8" banding over lead and steel. This patch became unsatisfactory when the size of the leak increased and was replaced by a section of rubber held by a steel clamp made to fit the line. This clamp held successfully but a limiting depth of submergence of 200 feet was established. It is believed, however, that the clamp would have held if an emergency had necessitated deep submergence. It is apparent that the section of line is badly deteriorated and will have to be replaced.

(c) PRESSURE HULL.

On 31 August fuel oil was discovered on the deck of the boatswain locker in the after torpedo room. Investigation disclosed a crack of about six inches in length in the pressure hull between #7 NFO and the after room. The leak appears to be in the weld between #7 NFO and the top of #7 MBT and is probably the result of a defective weld. The leak does not prevent deep submergence but presents a definite fire hazard.

(d) MESSENGER BUOYS.

On both the forward and the after messenger buoys, the after locking pawl arms were bent to such a degree that they no longer lock the cable drum. However, it is believed that the buoys will still operate satisfactorily since the forward locking pawl arms which are still operative will control the cable drum permitting it to function as designed.

(e) MAIN ENGINES.

During most of the patrol the only engine casualty was one cracked liner jacket (3105 hours) which was satisfactorily patched.

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Enroute from Hong Kong to Midway three more cylinder liner jackets developed minor leaks after 2651, 2675, and 1000 hours respectively. The piston rings in #2 cylinder of #1 main engine had to be replaced after 2800 hours of use. On 8 October the ball bearing in the pulley bearing assembly of #1 fuel oil purifier, burned out. Ball bearing was replaced, but it failed again about 4 hours later. The spindle and complete bearing assembly was replaced and no further bearing failures occurred. It is believed that a bent spindle caused the bearing failures.

(f) CLEANING OF BADGER STILLs.

The Nitre-Cake method of cleaning the stills was used just prior to departure on patrol and proved to be a great saving in man-hours of work. During the patrol the stills operated efficiently which was an indication that this method of cleaning is satisfactory.

(2) Ordnance and Gunnery

One torpedo ran erratic after running straight for approximately 1000 yards. The torpedo had been fired twice previous to this. The only possible cause of the erratic operation found by ship board personnel was a bad outer gimbel bearing of the gyro.

(3) RADIO

COMMUNICATIONS REPORT

(a) FOX SCHEDULE RECEPTION.

In general reception of fox from both Radio Pearl and Radio Guam has been excellent in regards to the readability and strength of signals and to the correctness of tape transmissions. Also, a pronounced improvement has been noticed in corrections made to errors in messages being transmitted. The only trouble encountered on fox reception was on the 0600 Zebra broadcast in the area between Subic Bay and Hong Kong. In most cases it was impossible to copy any of the broadcast, and at best, the signal strength never exceeded two.

Some difficulty was encountered on Radio-Guam's broadcast frequency 8530 KCS due to interference by other stations. Also jamming on this frequency was quite common by station or stations unknown. In one instance Radio Guam's transmission was being duplicated by hand sending and at a much slower speed. However, this jamming and interfer-

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ence did not render the above frequency useless.

(b) SHIP/SHORE TRANSMISSIONS.

All messages sent on the ship/shore series were readily received for. All calls were promptly handled by the radio operators at Radio Pearl and Radio Guam. At the same time proper circuit discipline was maintained with very few discrepancies.

The major discrepancy encountered on this series was the use of commercial prosigns by both Radio Pearl and Radio Guam when dealing with some Navy ships.

The use of DNC 14 series publications has proved very efficient and has speeded the handling of all traffic. The only exceptions noticed were the low frequencies used when within the 250 to 500 mile zone. In almost all cases when the frequency 8470 was to be used, the shore radio stations requested we shift to 4235 because of frequency interference or too heavy a volume of traffic.

(c) RADIO EQUIPMENT REPORT

(1) TBL Transmitter & Motor Generator.

From the beginning of the patrol to its conclusion, the performance of the TBL has been excellent. We have encountered three minor breakdowns which are as follows:

(a) Frequency drift in the output stage which was caused by a bad 860 master oscillator tube. Cause of failure was normal life expiration. Replaced tube, operation normal.

(b) Excessive voltages to the TBL. Main plate voltage reading 2500 volts DC, master oscillator plate voltage 1300 volts DC, Bias voltage 300 volts DC and filament voltage 15 volts AC. By adjusting the rheostat controls was able to drop main plate voltage to 2000 and the filament voltage to 12. However the bias voltage, master oscillator plate voltage and filament were still reading high. Upon investigation found the motor generator to be running at excessive speed. This was caused by the contacts of the centrifugal switch which were badly burned and pitted. Contacts were cleaned and adjusted and normal operation was restored. During this failure it was necessary to operate the transmitter for a period of approximately one hour which at the excessive voltages carried caused extreme damage to both the master oscillator tube and the two power amplifiers reducing their life to approximately fifty hours. This was proved by their failure one month later.

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(c) Master oscillator heater relay not working. First indication was the extreme heat of the heater compartment. The thermostat reading was above 72 degrees centigrade and the relay failed to cut out the heater circuit. Checked the heater relay and found both contacts badly burned. Replaced -
Operation normal.

(2) SCR 624

(1) SCR 624 transmitter putting out a CW signal but not modulating. Found an open lead in the phone circuit which was renewed restoring the transmitter to normal operation. At this time the receiver went out and the trouble was traced to the detector stage by use of the signal generator. However, after testing all components of this stage, no definite failure can be located. At present receiver operation is very poor with a strength two signal being received at close range.

(c) VLF REPORT

(1) Signal strength and readability on both VLF frequencies were excellent while enroute Pearl Harbor to Guam and while conducting exercises in the Marianas area. Speed of advance required between Guam and Yokosuka precluded copying on these frequencies. Tests conducted off the southern coast of Honshu, Japan revealed that signal strength and readability had dropped to an average between two and three. These tests off Japan were the last complete tests held on the patrol as operations conducted after departing this area were of such a nature as to make further test impossible due to depth maintained on all dives. However, brief periods were copied while at periscope depth at which times strength and readability were one and infrequently two. If complete test, could have been accomplished on different bearings and at various depths, it is believed that strength and readability would have attained three or four.

(2) The strongest reception was obtained when the plane of the loop antenna was on the true bearing of the transmitter. While on this bearing an average signal strength of four was obtained. Signal strength and readability varied from zero to two when the plane of the antenna was within twenty degrees of being a normal to the true bearing of the transmitter.

(3) Best reception was obtained at an antenna depth of approximately ten to fifteen feet. The signal faded out completely, in most cases, below this depth. There were no instances when keel depth of the submarine was required to be above 55' for copying.

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these signals.

(4) In comparing 16.68 and 19.8 KCS it is to be noted that the above frequencies are well adapted for underwater reception with 16.68 standing out as possibly the best frequency with regards to signal strength. However, great turbulence was encountered on this frequency which resulted in 19.8 giving better all around readability. Most of this turbulence is probably due to the fact that it more closely approaches the sonic range. This is derived from the fact that both screw and water noises can be recognized during certain periods of submergence.

(5) The major interference to VLF has been caused by the operation of radar which induces a high CW note across the entire VLF band making reception impossible except for a strength four to five signal.

(4) RADAR

(a) SS RADAR.

The SS Radar performance was excellent during the first eleven weeks of the patrol. The only difficulty encountered during this period was a shorted tube (393A) in the high voltage rectifier unit. This short caused general arcing and excessive currents which resulted in the blowing of high voltage and transmitter fuzes. Tube and fuzes were replaced and gear returned to normal operation. On 31 September the range error warning light remained lighted and ships force was unable to zeroize the range pulse with the transmitter pulse. The 500V DC tap from the auxiliary rectifier was too low causing improper horizontal deflection and focus in the A-B scope. When the sweep selector switch is shifted to the 80 milc sweep position, the PPI scope does not give any presentation. Switch continuity and capacitors were checked and found to be functioning properly. All the associated circuits, tubes and parts were tested, resistance reading and wave forms taken and the troubles remain. The RAZORBACK will request assistance upon return to Pearl as the present troubles are beyond the capacity of the ships force.

(b) SV RADAR

After one week of operations the SV Radar started blowing high voltage fuzes in the transmitter due to gassy modulator tubes (5D21's). Tubes were renewed but failed to last any appreciable length of time and it is believed that the faulty operation of these tubes was due to their age, as the acceptance date of these tubes was December 1943. It is to be noted that the performance of one modulator tube depends on three similar tubes being of the same internal resistance. Thus, if one tube becomes gassy and is removed and replaced with another modulator tube of slightly different internal resistance it will cause arcing in the other tubes of

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the modulator network. Also the "on time" potentiometer which controls the current to the modulator tubes cannot be advanced to the recommended setting because prior to reaching this setting high voltage fuzes are blown due to excessive current being drawn in this circuit. This has been an inherent trouble in this radar for over two years and assistance from Electronic Engineers will be requested upon return to Pearl as repair is beyond the capacity of ships force.

(c) ST RADAR

The performance of the ST Radar throughout the patrol was excellent except for the range troubles in the SS console which occurred on 31 September and were covered in the report on that gear.

(d) DAS 3 LORAN

In the DAS 3 Loran equipment the oscillator frequency control is inoperative, thus causing drift when the sweep speed selector is shifted from slow to fast sweep. Equipment completely checked, parts renewed and trouble remains. The ship will request assistance from the submarine base upon return to Pearl as the repair of gear is beyond the capacity of ships force.

(5) ELECTRONIC SPARES

(a) Use of.

(1) The use of consolidated spares on this simulated patrol has been very slight and has given little chance to determine the adaptability of our present allowance to the electronics equipment in use.

(b) SPARES - Increase Allowance of.

(1) The major items which have need of more frequent replacement are fuzes, among which the one half amp, 1000 volt high voltage fuze for use in the WFA ranging driver and the NGA driver are the most necessary. Also spares for use with the WFA and NGA recorder units, formerly on our allowance, should be incorporated in our new allowance. Besides the consolidated spares our vacuum tube allowance has fallen far short on such tubes as the 5D21, 807, 836, 12SK7 and 12SG7.

(c) Spares - Access to.

(1) The present stowage of spares has proven to be far superior to the old system as to convenience in locating necessary items. However the stowage of items too large for the drawer space provided has resulted in their being in a large bin which has made quick location difficult. Present solution to this problem is the separating of storeroom shelves into small compartments

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and stowing the larger spares in these spaces sorting them into small groups and itemizing each compartment as to its contents.

(6) SONAR

(a) JT SONAR

(1) Ranges for JT sonar varied from a low of 8000 yards to a high of 44,000 yards. Listening conditions in the Marianas area were considered good, however the only target available was one small AKL. Ranges of 12,000 yards were obtained on this target. The low ranges of 8,000 yards were obtained in the Japanese area. These ranges were not considered the result of a malfunction of the JT but were attributed to the extremely poor sound conditions found in this area. Sharp negative gradients commencing at 40 feet and increasing sharply at 90 and 200 feet produced a maximum temperature difference of 19 degrees. The extremely long ranges were obtained in the Philippine area and while enroute this area from Japan. Long range listening was conducted while enroute and 24,000 yard ranges were obtained daily. These ranges were received while hovering at a depth of 300 feet on a three degree negative gradient. Ranges from 30 to 40,000 yards were frequently obtained in the area off Subic Bay, P.I.

(2) The targets for operations conducted were as follows:

ASR, AKL, DD's, CA, and CL.

(3) The operation of the JT has been excellent. The only difficulties encountered was three degree lag in the follow up of the bearing card which was caused by a faulty worm shaft and gear in the training mechanism. No spares are carried for these parts and replacements have been on order for three months. This worm shaft and gear caused hunting in ATF and as a result this modification to the JT was not used on the patrol. The only other casualty occurred while in the Pearl Harbor area prior to departure for patrol. The neoprene cover of the JT baffle was torn during salvage operations off Lahaina. A spare baffle assembly was obtained but was not used as the JT performance was considered excellent.

(b) WFA REPORT

(1) Listening ranges on the WFA varied between 6 and 14,000 yards, listening frequencies employed were 15 to 18 KCS, 23 to 26 KCS and 30 KCS. All frequencies proved very effective when used under varying sound conditions.

(2) Echo ranging although little used, proved efficient up to 3000 yards. The type of exercises conducted limited the use of echo ranging to a minimum. However, sonar communications were

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used extensively for operations and top efficiency was maintained at extreme ranges with excellent results.

(3) The only operational difficulties encountered occurred in the blowing of the high voltage fuse in the ranging driver on 9 August. On 11 August the fuses in the training unit were blowing quite frequently for a period of two days. Replaced the thyatron tubes and decreased the bias voltage which restored training to normal.

(C) PERSONNEL AND TRAINING

The Operation Order directed that an intensive shipboard training program be conducted. The program conducted on this vessel during the patrol may be discussed under the following headings (a) qualification in submarines by enlisted men (b) advancement in rating (c) enlisted training in watch standing (d) Officer training.

The qualifications in submarines part of the program was based on daily lectures to all non-qualified men on the various systems, arrangements, and procedures in the boat. These lectures were given by petty officers who were most familiar with the particular subject and by officers. The lecture program lasted for the first two months of the patrol. During these first two months, the non-qualified men also worked on their required sketches and spent considerable time familiarizing themselves with the various compartments throughout the boat. During the last month of the patrol, there were no lectures and non-qualified men spent their time completing sketches and having their qualification cards checked off. During this final month each non-qualified man was assigned to a qualified petty officer who acted as both instructor and expeditor. The system seemed to work quite well. In addition, a poster listing all non-qualified men and indicating their per centage completed towards qualification was kept posted on the Bulletin Board. It is believed that this also helped to stimulate interest in qualification. LTJG BONDS and BLATTI, W.M., TMC were the officer and the chief petty officer in charge of the qualification program. It was a collateral duty for LTJG Bonds, but it was the sole duty for Blatti other than standing his hydraulic manifold watch. It is considered that both did excellent jobs.

Advancement in rating training was a department function and each head of department carried out his own instruction program. Most of this training was based on Navy Training Courses, but other "on the spot" instruction was given by department heads and senior petty officers on matters not sufficiently covered by the book.

The enlisted training program in watch standing was taking place continuously. All lookouts were rotated in the usual manner from lookout to helm to messenger, but, in addition, they had as one station a radar watch under the direction of the regularly assigned operator. This

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method accomplished two results: (a) trained the lookout to stand a radar watch (b) kept the radar operator from over-straining his eyes. When submerged, all lookouts were rotated amongst their submerged stations one station of which was JT Sonar. This provided considerable sound training for each of them since so much time was spent submerged on ASW exercises. Hydraulic manifold watch standers and electrician mates were rotated amongst various stations to give them broader training. One Chief Petty Officer, Mehalick, J., EMC who is considered to be potential officer material was trained to stand JOOD watches on the way back to Pearl from Hong Kong. During the passage from Yokosuka, Japan to Subic Bay, P.I. daily visual signal drill with the U.S.S. BLUEBIRD (ASR19) was held for a period of at least one hour. This proved to be of immense value since there is normally very little time for Quartermasters to receive this type of training. In addition, flag hoist drill coupled with tactical maneuvers was held during this same passage and proved to be of value to OOD's, Quartermasters, and the Communications Officer. From time to time maneuvering drill for inexperienced electrician mates was held. Telephone talker lectures were also given and they appeared to improve talker procedure. However, as has been found out many times in the past, this must be followed up by continual monitoring of the circuit.

All officers except one were qualified in submarines at the beginning of the patrol. The non-qualified officer, Ensign J.L. DICKEY, USN, reported aboard just prior to the start of the cruise directly from Submarine School. This officer's on-board training during the cruise consisted of giving lectures to non-qualified men; learning to stand throttlemans watches on the surface and during the dive; learning to man the controllers on the surface, on the dive, and submerged; standing various watches in the Control Room including the hydraulic manifold; and finally becoming qualified to stand an Officer-of-the-Deck Watch. During the early part of the patrol, he stood one watch as JOOD and the next one at one of the various stations below decks. In addition to watch standing, he managed to complete a large portion of his notebook work required for qualification. All officers took their turn at navigation under the supervision of the Navigator. All were considered proficient and made excellent landfalls without any help from the Navigator. One officer handled these duties during each different leg of the patrol. In making torpedo approaches emphasis was placed on the Junior Officers and their results were considered to be very good. Each obtained at least one hit. During these approaches the fire control stations manned by officers were rotated sufficiently to give additional training in these duties to all officers.

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The following is a tabulation of the results obtained in education and training during the patrol:

- (1) 9 men were advanced in rating during the patrol.
- (2) Five men passed the October 1st examination for advancement in rating.
- (3) One man was accepted for U.S. Naval Academy Preparatory School, Newport, R.I.
- (4) 6 men were qualified in submarines during the patrol.
- (5) The following submarine training exercises were completed:

<u>EXERCISE</u>	<u>REHEARSAL RUNS OR NO. TIMES EXERCISE CONDUCTED</u>	<u>FIRING RUNS (WHEN APPLICABLE)</u>
S-2-G	5	7
S-3-G	4	1
S-4-G	4	1
S-5-G	0	1
S-4-S	1	
S-11-E	1	
S-21-E	1	
S-22-E	1	
S-11-C	2	
S-21-C	33	
S-25-C	21	
S-41-C	46	
S-61-C	21	
S-62-C	3	
S-72-C	2	

(D) HEALTH, FOOD, and HABITABILITY

HEALTH

The health of the crew was excellent. Common colds, ring worm, and minor lacerations of the usual number occurred. One man was permanently transferred from the ship for medical observation. There were no communicable or venereal diseases during the patrol. The lack of venereal diseases reflects the results of the well prepared and well presented venereal lectures given by JONES, L.C., HML on the way to the patrol area.

FOOD

The quality, preparation, and variety of the food met the usual high standards found in submarines. However, there was a noticeable lack of fresh provisions (as distinguished from frozen foods) available in the

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Philippine Area and Hong Kong. All other types of food were available in adequate quantities. The amount of food spoilage was minor. However, it was observed that stowage of flour in the engine rooms is not satisfactory for long cruises in tropical waters. A cooler location would have reduced the spoilage that did occur.

HABITABILITY

The habitability was generally satisfactory although the boat was excessively hot during engineering exercises, active periods of ASW exercises, and long dives. The compartments from the Control Room forward continue to be the hottest part of the ship.

Games such as acey-ducey, checkers, and cribbage, plus the lookout contest helped a great deal as morale builders.

(E) MILES STEAMED - FUEL USED

PEARL HARBOR to GUAM	3370 MILES - 60650 GALLONS
GUAM to YOKOSUKA	1330 MILES - 21980 GALLONS
YOKOSUKA to SUBIC BAY	1620 MILES - 27510 GALLONS
SUBIC BAY to HONG KONG	540 MILES - 11000 GALLONS
HONG KONG to MIDWAY	3750 MILES - 64950 GALLONS
MIDWAY to PEARL HARBOR	1220 MILES - 17000 GALLONS
TO, FROM, and IN OPERATING AREAS	<u>4610 MILES - 49120 GALLONS</u>
TOTAL	16440 MILES - 252210 GALLONS

(F) REMARKS

1. GENERAL. The simulated patrol provided an unequalled opportunity to shake down the boat following a major overhaul, and to train the crew into a war-ready combat unit.

2. MATERIAL CONDITION OF THE BOAT AS RESULT OF MAJOR OVERHAUL BY NAVSHIPYD PEARL. The patrol lasted a total of 95 days, 79 of which were spent underway. Not a single day was assigned for upkeep, and not a single day was lost because of material failure. All commitments were met on time and carried through to the finish. This record can be attributed in no small way to the outstanding workmanship and thoroughness of the major overhaul completed on this vessel by the Pearl Harbor Naval Shipyard just prior to the start of the patrol.

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3. LACK OF YELLOW SUBMERGED IDENTIFICATION FLARES. When RAZORBACK departed from Pearl Harbor at the start of the patrol there were no yellow submerged identification flares available in the area. An adequate supply of green and red flares were loaded, and while operating in the advanced areas agreements were reached with the ASW surface forces that green signals would be substituted for yellow signals. This system worked satisfactorily but precluded the use of the green flares for their normal meanings to indicate torpedo fire and to indicate the submarine position on loss of sonar contact by surface ships. No other system was possible while still permitting full observance of safety precautions.

4. USE OF EVASIVE DEVICES AND PYROTECHNIC SIGNALS. The RAZORBACK loaded and used various evasive devices and pyrotechnic signals as indicated below:

<u>TYPE</u>	<u>NO. ON BOARD AT START OF PATROL</u>	<u>NO. USED DURING PATROL</u>
Red Flares	12	0
Green Flares	122	95
FTS	100	89
FTC	100	93
NAC	107	104

5. LIBERTY PORTS. When the patrol first started it was the general expectation among all hands that we would be spending much time in out-of-the-way places with little to do for recreation except beach parties and ball games. While there were no long stops in any one port, the regular weekend-liberty periods, with paydays adequately included in between whenever possible, provided just the right opportunities for rest and relaxation following each week's operations. Yokosuka, Manila, and Hong Kong were interesting and hospitable ports of call. The conduct of the RAZORBACK crew was exemplary. Not a single report of serious offense or of deliberate violation of rules was received.

6. BASKETBALL TEAM. The RAZORBACK basketball team ran up a string of seven consecutive victories over various opponents in the Western Pacific. Most of the opposing teams were from destroyers with which the ship was operating. In spite of little time available for practice, it is considered that the team did an excellent job of keeping the Submarine Force out in front in the basketball competition.

7. MAIL. Mail service during the patrol was poor. During the last week each in Japan and in the Philippines only a trickle of mail was received. It appeared as though our movements were being anticipated and that our mail in each case was being sent on ahead to our next port of call. No mail at all was received during the overnight stop at Midway.

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8. SUBMARINE "COLD-WET" CLOTHING. Submarine "Cold-Wet" clothing was used periodically during the patrol and proved to be more satisfactory than the usual type found on submarines. During heavy rain, the inside of this type clothing will stay dry for approximately three hours, which is well above average. Since the cruise was in tropical waters, no opportunity was presented for determining its suitability for cold weather. Two weaknesses were discovered - one was the lack of visor on the helmet to deflect water from flowing across the face and the other was the lack of suitable means of making the sleeves fit tightly around the wrist to prevent water from flowing down the arms while holding binoculars.

(G) RECOMMENDATIONS

1. EXERCISE TORPEDOES. It is recommended that submarines making the Western Pacific patrol carry six rather than four Mk. 14 exercise torpedoes. A limitation on the number of practice firings which may be conducted is placed on the submarine by virtue of the Bureau of Ordnance restrictions regarding the number of firings of each torpedo between overhauls. With the Western Pacific commands cooperating to the fullest extent possible in scheduling submarine torpedo firing exercises and with plenty of targets available, the submarine should be ready to take full advantage of all opportunities to fire.

2. SUPPLY OF YELLOW SUBMERGED IDENTIFICATION FLARES. Referring to Remark No. 3 above, it is recommended that an adequate supply of yellow submerged identification flares be kept in stock at Pearl Harbor. The lack of all the proper flares resulted in some minor inconvenience to surface forces and placed unnecessary restrictions on the ASW exercises conducted.

3. SUPPLY OF EVASIVE DEVICES ON PATROL. Referring to remark No. 4 above, it is recommended that a minimum of the following numbers of evasive devices be carried by submarines on patrol in the Western Pacific

- 125 NAC's
- 200 FTC's or FTS's,

It is further suggested that a program for the development of new devices be kept active to counter improved techniques and equipment devised by the ASW forces, and that all such newly developed devices be given extensive service tests by patrol submarines.

4. VACUUM TUBES. It is most strongly recommended that up-to-date vacuum tubes be provided for submarines on patrol. Lack of skilled technicians in the "forward" areas makes it impossible to get help from outside sources with the result that the entire burden of electronic

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maintenance and repair is on ship's personnel. Poor quality vacuum tubes serves to increase the already heavy work load on electronic technicians.

5. SCR 624 FOR ASR's. In order to provide for VHF communications between submarines and submarine rescue vessels while operating in company, it is recommended that the latter, at least while in the Western Pacific, be equipped with the SCR 624 with the same crystals as carried by submarines. This recommendation has been concurred in by the Commanding Officer of the BLUEBIRD (ASR19).

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ANNEX A

ASW and Submarine Evasion

The many hours spent as target for ASW attacks by DesDiv 51 (QGA equipped) and DesDiv 32 (QHB equipped) provided excellent opportunity for trying out and evaluating different methods of evasion. No new or startling system of certain evasion was discovered and no claim is made for any. Those tactics which proved to be effective are reviewed here for information.

1. A bathythermograph trace was taken on every dive and the data obtained was evaluated and used according to instructions contained in the manual "Use of Submarine Bathythermograph Observations," NAVSHIPS 900,069. It was surprising to learn that only one destroyer of each division was equipped with the surface ship type bathythermograph, and that none of the associated publications similar to those carried by submarines were available to the destroyers. It is the opinion of the Commanding Officer that every surface ship engaged in ASW should have and use the bathythermograph, and that considerable study should go into the evaluation of the sound conditions as based on B/T traces.

2. In the sharp negative gradients found off Japan, loss of contact was certain whenever the submarine went below the cold layer. In the isothermal waters of the Philippines, deep submergence was the best method of avoiding detection although by no means certain. On several occasions RAZORBACK was located and successfully attacked while running silent at 300 feet.

3. Best defense for the submarine against a destroyer attack group is counter torpedo fire. On the advanced air-surface coordinated exercises where the submarine was definitely spotted by the search planes and the destroyers were vectored in for attack, complete escape was considered highly improbable; and the most logical action for the submarine was to attack first. Twice we were able to get into excellent position between ships in line of bearing and launched simulated torpedoes from both tube nests before being detected. The approaches were easy as the destroyers were concentrating on a sonar sweep making slow speed and not zigzagging.

In exercises where initial contact and attack by the destroyers is implied, the best means of counter attack is to pop to periscope depth immediately after a destroyer has passed by on a depth charge attack. With only a very short time available to make the fire control setup and with the added hazard of possible depth charge attack by a second destroyer while firing at the first, the problem is by no means easy. This tactic is really more for GUPPIES whose higher submerged speed will permit faster changes of depth and better positioning of the submarine for attack.

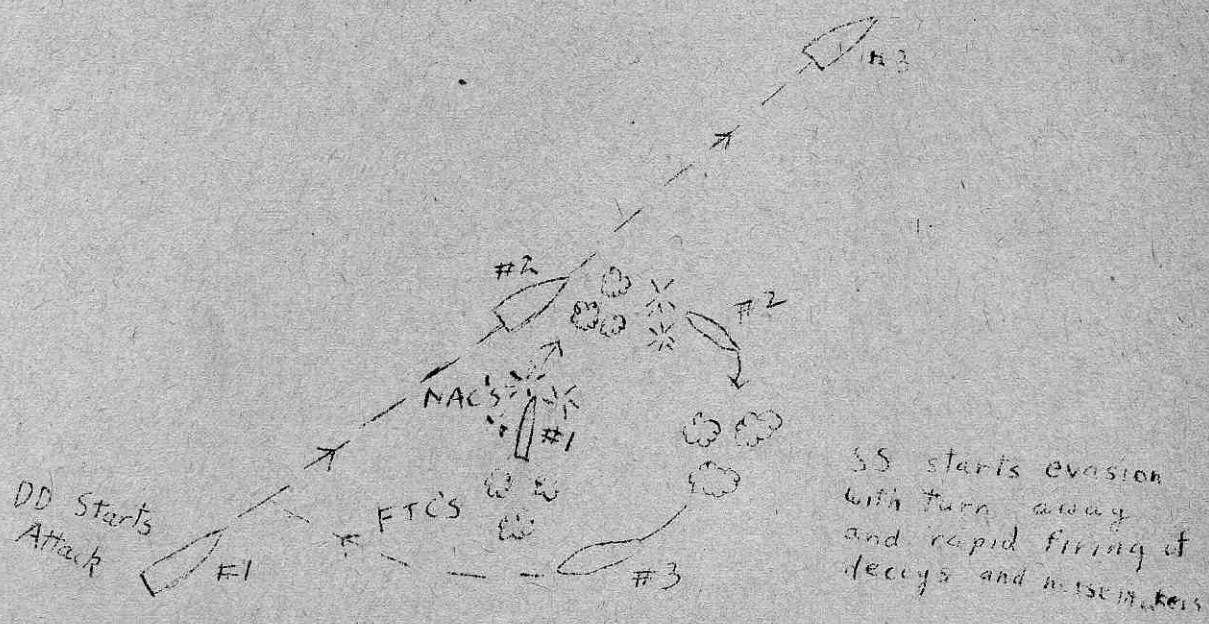
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It is recommended that the offensive use of torpedoes against destroyer attack groups be exploited to the fullest and that an actual exercise be set up in which a submarine is paired off against a division of destroyers with enough ready exercise torpedoes available to "sink" every destroyer in the division if his skill is great enough. Torpedo recovery facilities should be arranged so that the exercise could be carried to the finish without interruption for the submarine or the destroyers. Such an exercise would provide excellent advanced training for the submarine in firing at alert, fast and maneuverable targets, and would further serve to impress emphatically on the surface ASW forces the hazards to be expected in dealing with truly "offensive" submarines.

4. For evasion prior to counter attacking the best system found was to keep the attacking destroyer on the quarter and use radical maneuvers, decoys, and noise makers to the maximum extent possible. With a destroyer closing from either quarter for attack we found that one standard maneuver nearly always threw the attack off and resulted in at least a temporary loss of contact. The following sketch describes



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The purpose of the above maneuver was first, to avoid the immediate attack, and second, to throw up a blanket of noise and false targets between the destroyer and the submarine in order to permit the latter's escape. One point which made the maneuver even better was not realized until after discussing the results with the destroyer commanding officers. The full turn away almost invariably brought the submarine into the high speed wake left by the destroyer on his initial attack. The MAC noisemakers, fired three or four at a time, were very effective in completely blanking out the destroyers QHB gear. More than one was necessary in order to increase the intensity of the noise and to create irregular pulse beats. The FTS and FTC decoys usually were not effective alone, but when used with the noisemakers seemed to add something to the general confusion.

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U.S.S. RAZORBACK (SS394)
REPORT OF SIMULATED WAR PATROL NO. THREE

R-E-S-T-R-I-C-T-E-D

ANNEX B

Supplementary report of operations with British naval units during Third Simulated War Patrol.

1. During the period 8 to 27 August while under the operational control of Commander Support Group, Naval Forces Far East, based at Yokosuka, Japan, RAZORBACK conducted various tactical and ASW exercises with British units as narrated below:

17 August - At 0900 K at rendezvous position off Shiono Misaki, Honshu, Japan, (Lat. 33-10 North, Long. 135-45 East) RAZORBACK joined HMS COSSACK (D-57), HMS CONCORD (D-03), HMS CONSTANCE (D-71), and H M A S BATAAN (I-191) and reported for operational control to Captain D-8 (Capt. R.T. White, DSO, RN, in COSSACK) for ASW exercises. An intense rain squall covering the entire area prevented commencement of the exercises. RAZORBACK cruised in formation with the British destroyers until 1135 K when, with no improvement in the weather in sight, Captain D-8 cancelled the ASW exercises and released RAZORBACK for return to area off entrance to Tokyo Bay. USS BLUEBIRD was in company throughout this period for the purpose of providing submarine search and rescue services if required.

19 August - At 1200 K RAZORBACK took station for Event 21 in accordance with ComCruDiv One Operation Order No. 4-49, Annex A. This event consisted of a submerged torpedo (simulated) attack on a task group composed of the USS MANCHESTER (CL 83) screened by four U.S. destroyers of DesDiv 51 and the same four British destroyers formed into an interrupted circular screen, plus A/S air patrol flown by one Sunderland seaplane. Capt. White, RN, acted as screen commander during this exercise. RAZORBACK dived at initial range 14,000 yards, distance to the track 7,000 yards. A high speed submerged run-in was made, passing clear of the right flank destroyer (BATAAN) and gaining a fair firing position undetected. Six torpedoes set at low speed were simulated, average torpedo run 5,000 yards, spread for 150% coverage. On completion of Event 21 RAZORBACK proceeded to clear area and return to Yokosuka.

23 August - At 1210 K RAZORBACK joined HMS CONCORD and HMS CONSTANCE for ASW exercises in area to the southeast of Nojima Saki, Honshu, Japan. Dived to 90 feet at 1300 K and acted as target for Exercise Y-30-AW (USF 54). Surfaced at 1500 K and was joined by Captain D-8 in COSSACK. At 1541 K dived to continue Y-30-AW and surfaced at 1752 K. In spite of very poor sound conditions, with the submarine B/T trace indicating a sharp 8° negative gradient between 40 and 80 feet, the British destroyers equipped with their ASDIC were able to maintain continuous contact and to complete nine

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U.S.S. RAZORBACK (SS394)
REPORT OF SIMULATED WAR PATROL NO. THREE

R-E-S-T-R-I-C-T-E-D

good depth charge attacks. An officer ASW Instructor from the UTU Japan acted as liaison officer for Captain D-8.

2. On 5 October while visiting Hong Kong for recreation and goodwill under the operational control of ComSeventh Task Fleet, RAZORBACK provided target services for one 3-hour period of ASW training with British destroyers based at Hong Kong. The exercise was tentatively scheduled by ComSeventh Task Fleet on obtaining clearance for RAZORBACK's visit. The Commanding Officer completed detailed plans in person on 3 October with the staff of Flag Officer Second in Command, British Far Eastern Fleet, and with Captain D-8.

At 0700 I, 5 October, on returning toward Hong Kong after evading typhoon OLELLA at sea, joined Captain D-8 in HMS COSSACK (D-57), HMS COMUS (D-29), and HMS CHARITY (D-20) at lat. 21-30 North long. 114-45 East. At 0716 I dived to 90 feet and maintained steady course at 3 knots conducting Exercise Y-30-AW. Sound conditions appeared to be good. The B/T trace indicated isothermal conditions from surface to 70 feet, thence a sharp drop of four degrees between 70 and 90 feet. Twelve excellent attacks were completed in the three hour period. All attacks were signalled by hand grenade and were answered with an air bubble released from Safety Tank. Surfaced at 1018 I, exercise completed. Released by Captain D-8 to proceed independently to Hong Kong.

3. All of the above exercises were carried off smoothly and without mishap. Communications by visual, radio, and sonar were excellent. The British ASW technique appeared to be sound although perhaps a bit rusty because of the lack of submarine targets and therefore little opportunity for practice. It was the opinion of the Commanding Officer that the smaller British destroyers were more maneuverable and probably better suited for ASW work than the present large U.S. destroyers.

4. The Flag Officer Second in Command expressed his appreciation of services rendered by signal received on return to Hong Kong:

"MANY THANKS FOR YOUR READY COOPERATION IN EXERCISES WHICH AS ALWAYS IS GREATLY APPRECIATED".

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SUBMARINE DIVISION TWELVE
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San Francisco, California

FB5-12/A16
Ser 88
4 Nov 1949

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FIRST ENDORSEMENT on USS RAZORBACK (SS394) rest ltr SS394/A16
Ser 335 of 21 Oct 1949

From: Commander, Submarine Division TWELVE
To: Chief of Naval Operations
Via: (1) Commander, Submarine Squadron ONE
(2) Commander, Submarine Force, U.S. Pacific Fleet
(3) Commander in Chief, U.S. Pacific Fleet

Subj: U.S.S. RAZORBACK (SS394); report of simulated war patrol
No. 3

1. Forwarded.

2. This simulated war patrol was excellently planned and resulted in a maximum of training both for RAZORBACK and for units who received services. RAZORBACK conducted a total of nine (9) rehearsal and ten (10) torpedo firing exercises, one (1) photo reconnaissance of Subic Bay, and engineering tests in addition to services rendered.

3. The following comments are made on material:

a. Compensating Water System:

The ship's company did a fine job in repairing the leaky compensating water line in the control room. This was excellent training in the use of damage control equipment.

b. Pressure Hull:

The leak in #7 N.F.O. tank has been investigated by the Submarine Base Repair Department. RAZORBACK will have to be docked to effect repair.

c. Messenger Buoys (BuShips Plan #S9400-935407 Alt #4):

The reel stops (PcC3) for the float brackets (PcB3) on the after pawls on the messenger buoys both fore and aft are damaged. However, it is considered that both buoys would operate with the forward pawls on each messenger buoy functioning as designed.

d. Main Engines:

Casualties to the main engines were of a minor nature and the ship's force successfully effected repairs.

e. Cleaning of Badger Stills:

Normal.

f. The minor nature of engineering casualties experienced on the patrol indicates that the navy yard overhaul was highly satisfactory.

. The recommendations contained in section (G) of the basic report are considered to be well taken and are concurred in.

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Ser 88

4 Nov 1949

5. The commanding officer, officers, and crew are congratulated on the successful completion of this excellent simulated war patrol.

H. K. Nauman
H. K. NAUMAN

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J.S.S. RAZORBACK

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Ser 1148
5 December 1949

RESTRICTED

SECOND ENDORSEMENT on USS RAZORBACK rest ltr SS394/A16 ser 335
of 21 Oct 1949

From: Commander, Submarine Squadron ONE
To: Chief, Naval Operations
Via: (1) Commander, Submarine Force, U.S. Pacific Fleet
(2) Commander-in-Chief, U.S. Pacific Fleet

Subj: U.S.S. RAZORBACK (SS394); Report of Simulated War Patrol
Number 3

1. Forwarded.

2. This simulated war patrol was very well conducted and resulted in excellent training to both the U.S.S. RAZORBACK and forces under Commander, Naval Forces, Western Pacific.

3. The recommendations set forth in section (G) are concurred in. Providing that six torpedoes Mark 14 cannot be provided it is recommended that waivers on the Bureau of Ordnance overhaul restrictions be obtained for submarines on simulated war patrols. In regard to the evasion devices, it is further recommended that submarines departing on simulated war patrol carry one MAD-10

4. All engineering casualties suffered during the patrol have been corrected with the exception of the leak between Normal Fuel Oil Tank Number Seven and the After Torpedo Room. This work will be accomplished during the next scheduled decking and will include complete radiograph tests of the affected area.

5. The Electronic Replacement System proved effective and adequate except for the items mentioned under section (B)(5)(b) and (c). The comment concerning access to spares is similar to the one made by the U.S.S. QUEENFISH upon returning from patrol.

6. The recurrent failure of the SV Radar has been a source of constant concern to the RAZORBACK over a two year period. Technicians from the Electronic Maintenance Unit have been assigned to accomplish a permanent correction to the deficiency.

7. The on board training was thorough and the results gratifying. The rotation of officers navigating is considered excellent and is recommended for all submarines departing on simulated war patrols.

8. The report of flour spoilage stored in engine rooms has been the subject of separate recommendations in the quarterly Sanitary Report.

9. Upon arrival of RAZORBACK in the Pearl Harbor Area, physical examinations of all personnel were performed by the Epidemic Disease Control Unit No. 6, U.S. Naval Shipyard, Pearl Harbor, T.H. No enteric pateric pathogens or parasites were found.

10. The U.S.S. RAZORBACK is congratulated for the successful completion of an excellent patrol.

Rob Roy McGregor
ROB ROY MCGREGOR.

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COMSUBDIV-12
CO USS RAZORBACK

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COMMANDER SUBMARINE FORCE
UNITED STATES PACIFIC FLEET
Fleet Post Office
San Francisco, California

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THIRD ENDORSEMENT on USS RAZORBACK (SS394) rest. ltr SS394/A16 ser 335
of 21 Oct 1949

From: Commander Submarine Force, U.S. Pacific Fleet
To: Chief of Naval Operations
Via: Commander in Chief, U.S. Pacific Fleet

Subj: U.S.S. RAZORBACK (SS394); Report of Simulated War Patrol
Number 3

1. Forwarded.

2. The material condition of the RAZORBACK as evidenced by the long operating period with only a few minor repairs necessary reflects very favorably on the Pearl Harbor Shipyard Overhaul and on the routine maintenance practiced by ship's force.

3. Radio communications were excellent throughout the patrol. The frequency recommendations of the DNC 14 series were followed, and proved very helpful in clearing ship-shore traffic. Valuable data was collected on VLF reception and it will be incorporated in a separate report by COM SUBPAC.

4. RAZORBACK carried experimental foul weather clothing on this patrol. A detailed report, with questionnaires, has already been forwarded to the Brooklyn Naval Clothing Depot by COM SUBPAC.

5. Referring to the recommendations in section (G) of enclosure (A):

Exercise Torpedoes: Patrol loading instructions have been modified to provide for carrying 6, instead of 4, exercise torpedoes.

Yellow S.E.I.S.: An adequate supply is normally maintained at NAD, Oahu.

Supply of Evasive Devices on Patrol: The supply of evasive devices now available in the Pacific will not permit loading of the numbers recommended. COM SUBPAC will promulgate a patrol loading list of available devices.

Vacuum Tubes: The quality of vacuum tubes in stock, and their procurement by submarines, is under active investigation.

SCR 624 for ASR's: The subject of SCR installations in ASRs is being covered by separate correspondence.

6. In Annex (A) to enclosure (A), RAZORBACK recommends that an exercise be set up with a submarine opposing a well trained destroyer division, and that the submarine have enough exercise torpedoes to "sink" the destroyers. While this concept is excellent, the practical difficulty of torpedo recovery will preclude its use. It is considered that exercise No. S-3-G in USF 45(A) will provide the

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realistic training desired in attack and counter-attack for both surface craft and submarines.

7. It is noted that no cases of venereal disease appeared on board during this patrol. This is highly commendable, considering the ports visited, and indicates efficient instruction in VD control measures.

8. This excellently conducted patrol and well prepared report reflect great credit on RAZORBACK, and serve to continue the fine record of that ship. A hearty "Well Done" is given to the commanding officer, officers and crew.

JHB

J. H. BROWN, Jr.

Authenticated:

L. P. Gray, III
L. P. GRAY, III
Flag Secretary

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