COMMANDER DESTROYER FLOTILLA 1

SERIAL 0005 19 DECEMBER 1950

ASW OPERATION

EVALUATION OF SUBMARINE CONTACT OF USS MC KEAN WHICH WAS HELD AND DEVELOPED BY USS FRANK KNOX, USS ENDICOTT, AND USS TAUSSIG "PROBABLE SUBMARINE".

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TOP SECRET

UNITED STATES PACIFIC FLEET
COMMANDER DESTROYER FLOTILLA ONE
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SAN FRANCISCO, CALIFORNIA

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Ser 0005
19 Dec 1950

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TOP SECRET MEMORANDUM

CONFIDENTIAL - OPNAV INST 5500.30
BY [illegible] DATE 23 Mar 60
See CTF 95 [illegible] [illegible] 0001, 0002 of 12913 [illegible] 51. [illegible]

From: Commander Destroyer Flotilla ONE
To: CTF 95

Subj: Submarine contact - evaluation of

1. A review and study of the circumstances under which the USS FRANK KNOX (DDR742) had sonar contact was conducted informally on board that vessel during this forenoon (19 December). From this interview with the officers and leading petty officer (sonarman) concerned, the following was determined:

a. That the sonarman at the sound stack during the approach and actual attacks, T.R. MARK, SO1, USN, is an experienced QHB operator and that both he and the Electronics officer compare favorably with the personnel of the majority of destroyers that have come under my observation. Their long experience both in maintenance and operation of the present type of equipment on the FRANK KNOX gives credence to their beliefs that the contact was definitely a submarine.

b. That the contact had an "up doppler" on the first contact by the FRANK KNOX.

c. That as the range was closed for the 1st, 2nd, and 3rd attacks the sonar scope gave indications of a noise maker having been fired by the contact. This indication appeared as a "spoke" on the scope and was identified as a torpedo picture. (Ref. Page I-3, Third Partial Report by COMOPDEVFOR). This noise evaluated first as a torpedo was later determined to be a jamming signal. An explosion similar to a hand grenade was heard after the first attack and prior to the 2nd and 3rd attacks.

d. That the contact echo ranged on the FRANK KNOX during the 2nd approach. This ranging was determined to come from the contact and showed up on the tracing in an erratic pattern - entirely different from the assisting ships (McKEAN) ranging.

e. That there was a range rate during the first two runs of 17 and 19 knots respectively. This would indicate a moving contact. The range rate was zero on the fourth run. This run also showed no evidence of noise makers, interference, and no evasion.

f. That the indications on the recorder tracing give evidence electronics-wise that the contact was other than a mountain peak, rocks, etc. Also that indications of patterns of noise frequency changes (jamming), doppler, or changes in range rates, would have to come from a live or moving target.

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See CTF 95 ___ ___ 0002 ___ 1213 ___ New Sub

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2. The above indicates that the contact was a moving object and that the noises, changes in frequency in these noises, etc., indicated on the tracings, were being manipulated from a moving contact which was, more than likely, a submarine. However, on the other side of the picture there are no positive indications, other than the mechanical ones stated above, such as floating debris, heavy oil slick, etc., which definitely proves the contact to be a submarine. Actually, the only real positive evidence of a submarine in any contact such as this is to sight the submarine.

3. In summary, a contact can be classified as (a) positive, (b) probable, (c) doubtful, and (d) non-submarine. From the evidence and opinions obtained from the interview in the FRANK KNOX, and the information obtained from the McKEAN, this contact is evaluated as a probable submarine. Detailed questions and answers obtained at the above interview will be provided earliest.

K. M. McMANES

PS: I have not forgotten the "Battle of the Pips"!

My two expert Soundmen are now aboard the Knox to observe

Final evaluation number top clip
Tom mmm 4K

TOP SECRET

INTERROGATION OF MEMBERS OF USS FRANK KNOX BY COMDESFLOT ONE UPON THEIR RETURN FROM INVESTIGATING POSSIBLE SUB CONTACT BY USS McKEAN

STATEMENT BY T. R. MARK, SO1, USN:

We were on watch and as we came up on the McKEAN they reported a submarine contact about 8,000 yards ahead of us and they started to fire. Then we got in closer to the range to about 3,000 yards and by that time we had our general quarters team down there. Then we started echo ranging trying to pick up the McKEAN contact getting vectored in by them.

Q. What keying interval were you using?

A. We were using about 3,750 yards. The initial range was about 2,000 yards. The McKEAN had evaluated it as a definite submarine.

Q. Did you make any evaluation at that time?

A. As soon as I picked up contact after a few transmissions with the target, etc., I classified it as a submarine. It had an up doppler. As we closed the range to attack and get permission to make a firing run, the submarine fired a noise maker and a very sharp spoke came in on the scope.

Q. This spoke. That is the one that is square shaped. Did it have a pulse to it?

A. That spoke is identical to a torpedo picture. (Page I-3, Third Partial Report by COMOPDEVFOR). I reported it as a torpedo, probable torpedo, and believe the Captain took action and we got underway at a much higher speed. Breaking off the attack the Captain speeded up and I kept reporting it as a torpedo giving fast bearing, sweeping back and forth over the spoke. We turned around and regained contact about 600 yards. We had evaluated the noise not as a torpedo but as a jamming signal.

Q. Why?

A. It was still going on as we turned from it and as we got further away it got weak and strong. It kept coming in as an echo signal.

Q. Did the pip change any?

A. The pip changed up and down. The sweep from a low frequency to a high frequency got very erratic shape back to a low frequency and disappeared. I regained contact around 700 yards. We opened the range to make a re-attack. There was still noise. We came in and closed the range. We closed contact as we were coming in. We regained it about 1000 yards and we closed the range on contact but did not fire as we never could get around on the proper course. We opened the range again and another noise maker was fired.

Q. This is a different type of noise?

A. Same kind. This noise maker was very strong and I began to use every means I could to cut it out. You can look at the picutre and by screening at it you can get a definite pattern. During the attack there was no pattern.

Q. Did the McKEAN make any report that would give an indication that she might possibly have any trouble with her equipment?

A. No, I don't believe so. I don't hear anything that goes on up in combat.

Q. Did you hear any intermittent keying on her part?

A.

Q. Her keying seemed to be good and solid?

A. Neither ship had key casualty due to keying or anything. We had a recorder casualty, after we had fired I think 4 runs, which I fixed in a few minutes.

Q. But that was well after this keying that you heard?

A. Yes, sir. That was 3-4 hours later. The reason I believe this intermittent keying was not from our ship or assisting ship McKEAN is the fact that I got a pattern on the scope sort of a curvature, about actual size, 1/8" of an inch to 1/4" wide and about a half an inch long which indicates a keying on a lower or higher frequency. This appeared to be lower frequency.

Q. Was that the height of the signal across the half inch section? Was it varying?

A. No, it was steady. After the first firing run we opened up range at which time noise makers, two I believe, were still in operation. It was definite that the noise makers were far detached from the submarine making it easy for us to disregard them while working on the target but during this time I was looking for more which I figured might be a torpedo which gives the same picture. Run number two we came in on another noise spoke very strong and right on bearing of the target. Towards the end of the run ~~about~~ I put in peak filter again and cut most of the noise, about 95%, out.

Q. That was about the same effect that you had on the previous run? With relation to the noise?

A. Yes. We fired on run number two pattern able.

Q. Did you notice any doppler effect on this second run?

A. The second run had definite up doppler and a higher range rate. The range rate of the previous run can be seen on the paper and compared with run number two which shows a higher range rate.

Q. What percentage of it was cut out by your peak filters?

A. I cut about 98% of the presence of the spoke on the scope but the echo also went out after the picture. After I had the echo audibly.

Q. How about your noise?

A. I got rid of that. Still I had the echo audibly and tried to use the cut-on procedure. The signal died away, that is the echo, and I went back to band filter. On band filter the submarine emerged out of the noise spoke very easy to see. And heard hydrophone effects which give an indication to me that he was trying to slip out from underneath us.

Q. At what time did you hear these hydrophone effects?

A. I heard the hydrophone effects about the last 800 yards of the attack.

Q. All the way in?

A. Yes, sir.

Q. By the hydrophone effects you mean the key?

A. No, sir, I mean the submarine. The submarine moved quite a distance out of the noise sector in the last five or 600 yards of the run.

Q. Do you have any estimation of the speed?

A. Our range rate was about 17 knots and the noise spoke moved off bearing of the submarine which gave little or no interference in the end of the run. We finished out the run firing one pattern.

Q. That was A-pattern?

A. Yes, sir, pattern able.

Q. On your way in is where you discovered the key?

A. During this run we heard echo ranging and I definitely believe it was not from the McKEAN.

Q. The reason you believe it was not from the McKEAN was because it was erratic keying? Was it a much lower pitch?

A. It gave a square pulse shape on the scope.

Q. Did the note appear to vary in frequency?

A. No. It was a good solid note. It was steady frequency.

Q. Was that the first time you had heard that keying?

A.

Q. Did it persist always after that till you left the scene?

A. It disappeared.

Q. This interference that you got before you went in on the approach on this first attack. What did you evaluate that as?

A. These transmissions were the McKEANs. You get a line if you screened at it.

Q. What speed were you making?

A. I would say about all the time the ship was making 15 knots. The ship's speed was 15 knots on all attacks. With up doppler echos and the submarine moving out of noise spoke we had very strong hydrophone effects. The submarine put a pronounced wake behind it and the wake was being picked up in towards the last few hundred yards of the run.

Q. Did you have definite pattern between wake and target?

A. Yes. It was very easy to see due to the submarine's speed. We opened the range for another attack which we of course got another jamming signal. The same type jamming signal but it was another one. He definitely fired another noise maker. As we opened the range for re-attack we had a new signal introduced which completely blocked out the QHB scope and was of a spiral nature with a rise and fall of frequency.

Q. At about what range were you at this time?

A. About 1300 all the way in to 800 or 500. This made it practically impossible to get an echo.

Q. What types of antijamming did you use at this point?

A. I went to peak filter and of course cut in MCC off and on and manipulated my gain trying to cut it out.

Q. Did you try any frequency change?

A. Negative. This spiraling signal died away abruptly. It lasted not more than 15 or 20 seconds. It was never heard again and when it disappeared we were about 500 yards from the target and continued in on our run.

Q. Did this spiral interference -- did it sound anything like the previous noise makers you had heard?

A. No

Q. What was the type of its signal?

A. The noise maker with the spiral presence sounded as if they were increasing and decreasing their transmitter frequency on the submarine.

Q. Did it appear that they might possibly be trying to get a zero beat on your frequency?

A. I think that is what they were trying to do. I don't think they knew how effective it was because they stopped with ample time enough for us to finish our run with all the needed information, range rate, etc.

Q. After this point did you receive any further intermittent keying?

A. No.

(Remarks by Crawford, ETC, USN) It appears that the operator at the submarine end accomplished his purpose in sweeping the zero frequency of our equipment aboard the FRANK KNOX. It looks likely that he found the frequency and then shifted his frequency either appreciably higher or lower and used that frequency as a means of determining the position of the ship without being investigated by the ship. There is a remote possibility that he has a broad range of frequency control, and by shifting up or down he could get above our scope and we would never know it. The fact that he disappeared right after he screened our frequency indicates that he definitely did shift his frequency one direction or the other.

(Remarks by Mark, SO1, USN) This sound with the spiral signal from my experience sounded like older equipment possibly something like QCS and T magneto strip type of equipment. It definitely was not strong in power. It reminded me of more zero beating their equipment on the older type sonar equipment listening to them while on watch.

Q. (Adm McManes) Was there anything in the remaining runs that was unusual or different from this general pattern? Would you summarize those?

A. I can't think of anything else that was out of the ordinary the last two runs.

Q. Just prior to run number 3 where you had 3 distinct echoes is there any possibility that you may have been picking up false target shell that the submarine may have released? Were these other echoes sharp with no doppler echoes along with you?

A. I can't answer that because I don't remember. Disregarding no doppler outside echoes because we had been firing depth charges and I believe these echoes are from the turbulence from the other depth charges and I was trying to keep away from getting off one of those.

Q. You mentioned previously that during this search time and your attack time you heard explosions. Were these at any definite time with relation to your attack time?

A. They were after we dropped charges.

Q. Did that occur every time after you dropped charges?

A. I don't remember. Maybe the ASW Officer can answer that. I can't.

(Statement by LTJG W.P. Warlick, USN, ASW Officer) On 3 of the runs they definitely heard explosions just prior to the jamming signals 5 or 10 seconds. It sounded like a hand grenade. It could have been the charges going off or it could have been the exhaust of blowing these noise makers out into the water. Our submarines fire noise makers by compressed air but those noise makers did not appear to be fired in that manner.

Q. Do you have anything further that you think would be of value to us in evaluating this?

A. (By Mark, SO1, USN) Run number 4, the only thing is no noise makers, no interference, beam target on dead target right on into the firing time. No evasion. Did not hear any doppler and it was a straight 15 knot range rate. The echo quality was very sharp.

Q. How long did you hold him? As a dead target?

A. We regained contact from run number 3, 1800 - 2000 yards about. We came in and shifted to short scale and finished out the run. You can see on the paper in run number 4 some more keying signals but I think they are the McKEANS. I don't remember hearing any out of the ordinary keying signals. Run number 4 we completed firing and run number 5 was uneventful. It appeared another dead target or very very slow target. I believe the submarine was trying to sneak off under cover of wakes, depth charge explosions, turbulence, and did not use any evasive maneuvers except very slow speed. Our submarines' defense against QHB is slow speed so there is no cavitation or wake. It is easy then for the operator to get off on a false target or wake and still get the same echo quality, and thereby the submarine -- if he is low enough in the water -- he can sneak off.

Q. How long have you been a sonarman?

A. Since November, 1942. I started striking for sonar on an old World War I destroyer, a four-piper. I went to the HERNDON (DD368) which had QCJA equipment and then got new equipment, QGB. I went to Sonar Maintenance School at Key West, Florida and then back to the fleet. In 1946 I went aboard the SHELTON as pre-commissioning detail. The SHELTON had QGA.

Q. Are you a graduate of the Sonar School?

A. In 1947 I went to Fleet Sonar School in San Diego where I was teaching for 2-1/2 years maintenance and also QHB maintenance for about 5 months and I

was sonar maintenance instructor there and was fortunate enough to go to NEL lectures although I did not have much contact with the operations department. We had UTE training in San Diego where my men and myself had our first experience with brand new QHBA and we made 17 runs and got about 49 or 50 hits which gave us quite a bit of practical and also in Honolulu our experience with the SEA FOX was invaluable because it gave us a more fleet type submarine and we had very good experience there, too.

Q. How long have you been in the FRANK KNOX?

A. Since March, 1950.

(Adm McManes) Crawford, you have visited all the destroyers that have come in and examined their sound gear, sonar gear, talked with the operators -- what is your estimate of the ability of the sonar team in the FRANK KNOX?

A. I don't feel exactly qualified to evaluate them as operators. However, I feel that a good materiel man must also be a good operator of his equipment in order to evaluate the trouble that he has with his equipment. I found on this particular ship that the electronics officer and the men were always willing and eager to accept any suggestion that I have and at the same time their equipment is always in the best shape of any that I have a chance to come in contact with. Also it was aboard this ship that we discovered a trouble that had us all snowed in COMCRUDESPAC including the field engineers for a period of about 6 months and I claim that we probably would not have found it for quite a while after that had it not been the suggestions made by Marks and the Electronics Officer on board here.

(Adm McManes) From past experience aboard the KNOX and observing her operators I feel that they were in pretty good shape as far as a team and due to the fact that Marks has been mostly a materiel man he apparently attached himself to this QHB equipment as far as operating it goes very well in the short time he has been aboard here. Marks, with all the information you have given us and what you know about it and sat in here through these first attacks, do you think in your own mind without any shadow of a doubt that you got a submarine contact?

A. I believe without any doubt that we had a submarine. I have never had as good a contact. Even at times with our own submarines I don't think I have ever had as good a contact and I classify it definitely as submarine and I think he is still there. I believe he is either sunk or just waiting for us to get tired and forget about it. I definitely without a doubt believe it was a submarine.

(Statement by CDR S.J. Caldwell, USN) I believe it was a definite submarine. That opinion is based more on the jamming showing up on the scope than on any target movement. I have always been a little skeptical of doppler and believe range rate gives a better overall picture of what the submarine is doing. The pips on the PPI scope on the bridge looked exactly like pips of our submarines when we were engaged in exercises with them. The spoke jamming and spiral jamming satisfied me that the contact was an actual submarine.

(Adm McManes) Crawford, from your examination of the recorder and the answers which you have heard to various questions put, is there any doubt in your mind that it was a submarine?

A. No, sir. Electronics-wise, everything makes sense. Nature or rocks or anything that forms that might be in that water could not possibly put the effects on the paper that are there and also show up on the scope and be evaluated as Marks has evaluated.

(Adm McManes) Crawford, suppose there was a hulk on the bottom. Would you not get an echo from that?

A. Yes, sir, you would get echoes from the hull but you would not get these definite patterns of noise. You would not get frequency changes. You would have no doppler at all. You would have no range rates. There are many things that have shown up here such as your intermittent keying, your frequency sweep, your inferference patterns, your range rates, etc. That indicates that there had been life on that contact to create those things.

Q. (Adm McManes) Lieutenant Warlick, in your opinion, from all the information which you have had available and sightings that have been made from the bridge, is there any doubt in your mind as to whether or not it was a submarine?

A. No, sir. All the features have been brought out here by Marks; the range rate, echo quality and I agree with Caldwell that the clincher is the jamming.

(Adm McManes) Does anybody know of any other indications? Did anybody see anything from the topside that hasn't been brought out?

A. This may not be a definite indication, but both McKEAN and ourselves noticed an expanding of the oil slick on the surface a considerable time after the last charges had been dropped.

(Mark) It seemed to me before this target became a dead target -- no motion near the last after about run number 6 or 7 -- that during those 4, 5, 6 runs the submarine appeared to be doing everything in his power to get out of there. But he was, in my opinion, hampered by the shallow water. If he came up the aircraft would have seen him. He had to stay down and then after we heard these slight explosions which we can't quite account for, depth charges or not, and then keying stopped, the jamming stopped even though at times when I would lose contact and the McKEAN would lose contact we would vector ourselves back in and pick him right up again as he appeared to be staying in that one place. He never did move for quite a while. He either stopped all evasive operation and was a dead submarine or was playing possum. But it appeared in the initial runs he was, in my opinion, doing his best against the commanding officers on these two ships to get away. I honestly believe he would have outsmarted them and got away if we would have had searchlight equipment. The change of this equipment permits them about 99% of the time to know where he was visually as well as audibly.

(Price) After TAUSSIG arrived it appeared on the CIC plot that the submarine then appeared to get underway on the approach of the TAUSSIG which might indicate

that they heard the arrival of the TAUSSIG and anticipated another attack. McKEAN called and gave us a course and speed of approximately what we had plotted. Shortly after the first attack by the TAUSSIG the speed appeared to drop to what was an average we considered to be 3.5 approximately. After a minute there was no further movement of the submarine or did I notice any further movement throughout the night. It would be a very good place to lie in order to watch ship movements back and forth in Sasebo. The McKEAN and ourselves checked on the noise and got a bearing and we got that and I have that plotted on the first sheet down there which plotted very closely within the track line.

(Adm McManes) During the night did you drop any flares or float lights or dye markers?

A. No, sir. We dropped dye markers yesterday. There were none dropped last night to my knowledge. We did not make any attacks after the TAUSSIG arrived. She made her attacks. Whether or not she dropped dye markers I do not know.

Q. You did not see any float lights?

A. No, sir.

NOTE: Pattern Able depth setting varies from 75 to 150 feet. Water was 45 fathoms. First run was Able. Thereafter all runs were Baker; depth setting 250 feet.