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USCG HEADQUARTERS
CLASSIFIED MATERIAL

From: Commander, Fourteenth Coast Guard District
To: Commandant (OAN)

Subj: Central Pacific Loran-C System

1. Enclosure (1) is forwarded for information. The USS OBSERVATION ISLAND (EAG-154) used the subject system during Pacific Missile Range Operations between 28 March and 12 May 1964.

A. W. JOHNSON
By direction

Encl: (1) USS OBSERVATION ISLAND ltr 9784/4 Serial 028 of 14 May 1964

RCVD JUN 19 1964 OAN
From: Commanding Officer, USS OBSERVATION ISLAND (SSC-194)
To: Special Projects Office (Attn: DP-25)

Subj: General comments on LORAN-C coverage in the Hawaiian-Johnston-Kuri Chain.

1. The following comments reflect the experience obtained by OBSERVATION ISLAND while using LORAN-C in the Hawaiian-Johnston-Kuri Chain area. It is hoped they will prove useful to prospective users of LORAN-C in that area.

   a. When approaching Oahu from the eastward, particularly at night, the user of LORAN-C must beware of sky wave reception from the Kuri station. The sky wave appears as a very strong signal about 40 microseconds delayed from the ground wave. The Kuri ground wave was practically unrecognizable on the receiver scope. The receiver showed a strong tendency to slip from the ground wave and attempt to lock on the sky wave.

   b. In the vicinity of Oahu proper, LORAN-C is not useful for precise navigation because of the weak Kuri signal. In that area the LORAN-C hyperbolae are virtually parallel to latitude and longitude lines, with KURI-JOHNSTON providing the latitude lines and Hawaiian-Johnston providing longitude lines. Latitude position showed an oscillation of ±0.2 miles centered about a point 0.25 miles south of the ship's actual position. Longitude position was good. Good lock-on to the Kuri signal was usually possible if the ship was dockside or steaming a steady course and speed. Maneuvers in general would cause loss of lock.

   c. LORAN-C signals became good for accurate navigation about 100 miles west of Oahu and remained good for the rest of the trip to Johnston Island. The determination that the signals were good came from the facts that the Kuri ground wave was easily recognizable on the receiver scope and the fixes achieved good repeatability. Normal deterioration of the accuracy occurred near the Kuri-Johnston base line extension. In the launch area (10° 50'N, 166° 50'W) the repeatability of fixes was outstanding.
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1. An additional indication of signal quality was gained by
   scanning (listen only) the LORAN-C inter-station communication
   net (1871.5 kc night; 3631.5 kc, 7474.5 kc, or 7472.5 kc daytime).
   By monitoring this net, it was possible to hear exactly how far
   envelope and cycle were out of tolerance.

2. As per previous agreement with CDR R. V. Weston, CCOD 14
   Communication Officer, the Coast Guard was advised in advance
   by passage as to the hours good LORAN-C coverage was mandatory.
   On the first launch, coverage was outstanding. On the second
   launch the LORAN-C stations encountered difficulty remaining
   in tolerance, however coverage was good during the terminal
   portion of the count. On the third launch coverage was excellent
   with some difficulty during early portions of the count.

3. Unknown as yet by OBSERVATION ISLAND is the geostatic
   accuracy of the LORAN-C stations. CR-23 is checking this with
   the Oceanographic Office.

4. OBSERVATION ISLAND experienced excellent cooperation from
   the Coast Guard during all phases of operations in the Hawaii-
   Johnston area.

R. C. MIDDLETON

Copy to:
CR-23
Oceanographic Office
Commander
Coast Guard