TREASURY DEPARTMENT
U. S. COAST GUARD
CG-3883 (4-59)

U. S. COAST GUARD

RAPIDRAFT LETTER

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Commander,
Fourteenth CG District (o)
1347 Kapiolani Boulevard
Honolulu, Hawaii

STAFF SYMBOL AND FILE NO.

OAN-3

DATE

7 Dec 1964

NOTE - Send in window envelope (size 8⅞" x 3⅞").

(Fold)

Subj: LORSTA Miyako Jima's CG-2899 for October 1964

1. It is requested that the reference, in block C, to the use of "CDA's" on rate 2H5 be explained.

B.R. RYAN

RCVD DEC 22 1964 OAN 1535

Reply (if required)

1. Since 1 September 1964, Loran-A rate 2H5 has functioned on a master controlled, coding delay operation during night time when locally generated errors are introduced into slave monitor equipment. This operation is similar to Loran-C Method TWO Control. Enclosures (1) and (2) are forwarded for information relative to action taken in this regard. This method has proved successful in avoiding an otherwise unpredictable system error.

J. 2H5 type 3 manual blink
Remarks: Master controls coding delay during nighttime to maintain constant monitor standard T.D.
FS. 2H5 type 3

E. C. CROSBY
By direction

Encl: (1) CCGD14(e) ltr 10553/FESEC, Ser 18623 dtd 19 Aug 1964
(2) CCGD14(e) ltr 10553/HQGEN, Ser 18622 dtd 18 Aug 1964

COMMANDANT,
U.S. COAST GUARD
1300 E ST NW
Washington, D.C. 20226

← SENDER'S MAILING ADDR

Reply hereon and return in window envelope (size 8⅞" x 3⅞").

96814

10553/FESEC
Serial 18623
19 August 1964

AIR MAIL

From: Commander, Fourteen Coast Guard District
To: Commander, Far East Section

Subj: Loran-A, Rate 2H5; information concerning

Ref: (a) CCGD14 ltr 3260, Serial 32143 of 25 June 1964

1. Reference (a) gave some background information of the error phenomena, real and artificial, caused to Loran station electrical synchronizers by adjacent rate skywave, and/or noise. Recent reports have indicated that rate 2H5 operation was being adversely affected by similar effects.

2. Analyses of data from MIYAKO JIMA, GESASHI, and IKE SHIMA, for rate 2H5 over the initial ten day calibration period conclusively indicates that the slave is introducing a coding delay error into the system during the night hours. The excellent correlation between master and special rate monitor indicates that the degree of local error to the master synchronizer is negligible in the face of the system error introduced by the slave. Accordingly, MIYAKO JIMA is considered an accurate rate monitor.

3. To retain as many of the desirable features of Type Three operation as possible and still offer an interim relief to this problem, the following is authorized and directed for Rate 2H5:

a. MIYAKO JIMA (monitor) type three operation, less auto blink. Synch error auto alarm set for plus/minus one microsecond. To minimize operation of alarms by noise on transients, synch control unit motor speed should be reduced from the nominal, good S/N ratio setting of 5 (Low Range), to 3, or lower, if conditions dictate. Motor speed settings must be included on charts and logs. At the initiation of a synch error alarm, MIYAKO will check operation at the operate and standby timers, analyze T.D. variations at the operate timer chart recorder and compare with manual, video derivative pulse match observation at the standby timer. If both observations are in agreement, direct GESASHI to make a Coding Delay Adjustment (CDA) of the proper sign to realize standard master reference T.D. Refer sign and value of CDA on charts and/or logs.

b. GESASHI (Slave) Type Mimeo operation. Maintain 1000 microseconds coding delay, verified by monitoring at standby timer. Synch control motor speeds should be reduced during night time operation, or during periods of heavy noise or interference. Speed setting of 2, or lower if necessary, are suggested.

Main Coding Delay Adjustments, when, and only, as directed by MIYAKO JIMA. Recheck adjustment of the auto synchronizer for every CDA. Sign and amount of CDA must be entered

on charts and logs as well as video derivative pulse match, manual T. D.'s from standby timer, before and after making any CDA.

4. These instructions are to be implemented upon receipt. Airmail master and slave chart recorder sections covering the first week of such operation to CCGD14(o). MIYAKO and GESASHI comments are requested.

5. It appears that other rates are similarly affected. These, however, will be treated separately. Commandant has be advised of these problems and the interim operating procedures. Any additional suggestions or information you may have to offer will be welcome.

C. F. SCHARTEMSTEIN, JR.
By direction

Copy to:
CO, MIYAKOJIMA CGLORSTA
CO, GESASHI CGLORSTA

BLIND COPY TO:
CCGD14(oan)
CCGD14(o)

10553/HQGEN
Serial 18622
96814 18 August 1964

AIR MAIL

From: Commander, Fourteen Coast Guard District
To: Commandant (EEE)

Subj: Western Pacific, Loran-A, Rate 2H5 Operation

Ref: (a) My ltr 10553/HQGEN, Serial 18562 of 23 July 1964
(b) Comdt(OAN-3) ltr of 10 August 1964

1. Reference (a) forwarded calibration period test summaries for the reconfigured Western Pacific Loran-A system, recommended time difference and operational standards, and reported that tests were in progress to analyze "out of tolerance" blinking being experienced on Rate 2H5. Reference (b) approved these operational standards recommendations as permanent assignments.

2. Subsequent evaluation of master, slaves, and monitor data for the entire ten day calibration period conclusively indicates that an actual rate error is being introduced by the slave, probably due to the multiplicity of Loran-A rates at GESASHI and their contribution to overwhelming local "back scatter" skywave effects to auto synchronizers. As in other such cases, the degree of "off-set" was found to vary nightly, and undoubtedly will also change seasonally, varying with the propagation conditions.

3. Time differences data for the ten day period from all system units are plotted on enclosure (3). In view of the excellent correlation, particularly between that of the master (MIYAKO) and the special rate monitor (on LorSta OKINAWA), we believe that any local effects to the master synchronizer, in this particular case, can be considered negligible when compared to the actual system error introduced by GESASHI, and that MIYAKO is capable of accurate rate monitoring. We have therefore temporary amended the MIYAKO JIMA rate 2H5 operating standards established in reference (b), pending your review, to include all the authorized provisions --- type three operation, less auto blink --- with the additional instruction that auto alarm circuits should not be set for plus-minus one microsecond. Upon activation of the synch error alarm --- or timer before, if conditions warrant --- MIYAKO will check rate operation as plotted at the operate chart recorder, and will direct GESASHI to make appropriate compensating coding delay adjustments. In all other respects normal auto synch operation will continue.

4. Enclosure (2) is an enlarged plot of a seven hour segment on the last day of the calibration period with Performance Test conditions prevailing. Rate 2H4 Master (MIYAKO) is also plotted for comparison. It will be noted that an off-set approaching one microsecond was also experienced for this rate. However, since normal, automatic, type three operation limits are not exceeded, nor it is definitely known at this time whether or not this off-set represents a system error, no immediate 2H4 correction is contemplated.

CCGD14(e) ltr 10553/HQGEN, Serial 19615 of 18 August 1964 to Comdt (EEE)

5. We understand that the problem of synchronizer contamination is under active EEE study. In the interim we request authorization for rate 2H5 operation as discussed, and further, recommend application to other similarly affected rates, assigning control responsibility as dictated by the prevailing conditions. What if:

a) ensure a cross-rate exists in a good S/N ratio area, appropriate slave coding delay adjustments should be made at the counter direction to counter slave auto synchronizer off-sets, Master out of tolerance blinking should likewise not be initiated unless out of tolerance conditions are verified by the monitor,. (Similar to Loran-C - Method One Control)

b) in the absence of an effective cross rate monitor, and where it is has been determined that locally induced, artificial errors are not a problems, the master station should direct necessary coding delay adjustments. (Similar to Loran-C - Method Two Control)

c) in the special case where poor S/N ratios, and/or verified artificial electrical synchronizer errors at the master preclude objective rate reconfiguring --- and assuming satisfactory S/N at the slave --- the slave should assume rate control, ,monitoring the transmitted coding delay at the standby timer, correcting as required. Similar to Loran-C – Method Three Control)

5. Operation of other rates is being analyzed, specific recommendations will be submitted as developed.

C. F. SCHARTEMSTEIN, JR.
By direction

Encl: (1) Rate 2H5 10 Day Operation T.D. Plot (1 copy)
(2) Rate 2H5 Performance Test Plot (1 copy)