TMC SPECIFICATION

NO. S-913

REV: 0A

COMPILED: [signature] CHECKED: [signature] APPD: [signature]

SHEET 1 OF 5

TITLE:

Typed by mtp 1/29/65

LRRA FINAL TEST

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I. EQUIPMENT REQUIRED

a. Signal Generator - Marconi TF144A or equivalent.

b. Frequency Counter - HP 5244L or equivalent.

c. AC VTVM - Ballantine 314 or equivalent.

d. SONIC ANALYZER

II. INITIAL CONTROL SETTINGS

a. VLRB Receiver:

Band - to 30-55 range
Tune - to 30 KC
Noise Silencer - OFF
Meter Switch - ZERO DBM
BFO - to center position
RF Gain - Full clockwise rotation
AGC Decay - FAST
Mode - CW
IF Selectivity - .5
Synth. - TUNE
Line Level - Counter-clockwise
AF Gain - Fully clockwise
Power Switch - ON (up)

Connect a 600 ohm resistor across "600 ohm" terminals of terminal board E101 on rear apron of receiver.

b. LFSB Synthesizer:

Power Switch - ON (up)
Frequency Multiplier - "Times 1 "
Set all frequency selector knobs t 3 0 . 0 0 0

c. Frequency Standard CSS-2:

Meter - Oven Temp.
Synchronize - OFF
Amplifiers - ON

d. LP4A Speaker Panel:

Volume - Pointer vertical (12 o'clock)
Channel - A

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e. LFCA Sideband Converter:

Synth. - up
Monitor - OFF
Gain (LSB/USB) - Fully CCW
Meter - OFF
Power Switch - ON (up)

III. LRRA PRELIMINARY ADJUSTMENTS

Prior to commencement of tests in accordance with LRRA Final Test, a warm-up period is required during which the CSS-2 Frequency Standard is powered and allowed to stabilize. An initial warmup of at least 24 hours is required to allow for full stabilization. The meter on the front of the CSS-2 should be in the green portion of the calibration when the Meter Function switch is placed in the "Oven Temp" position. This indicates normal heating.

Before operating the balance of the equipment, install 600 ohm load resistors across the 600 ohm terminals of E101 at the rear of the VLRB receiver, and across the 600 ohm USB and LSB terminals to be found in the termination box of the RAK.

IV. CHECK OF SYNTHESIZER/RECEIVER OPERATION

1. On VLRB, turn tuning knob for ZERO beat.

2. Turn Synth. knob to ON.

3. On LFSB, Synch light should go off and Synchronize meter pointer should remain stationary.

4. DELETED

5. Place SYNTH. switch on VLRB to tune, and zero beat, using tuning control.

6. Turn SYNTH switch to "ON". SYNC ALARM should remain off, and meter pointer should stabilize at the center location.

7. Repeat above operation for each succeeding cycle in 1-cycle steps.

   a. Repeat in 10-cycle steps using second knob from right.

   b. Repeat in 100-cycle steps.

   c. Repeat for 1 kilocycle steps.

d. Repeat for 10 kilocycle steps.

After the 10 KC control has advanced to 50 KC, it is necessary to shift the bands on the VLRB. To go to 60 KC, the bandswitch must be set to band 2 (55-100). This band will be used to complete the 10 KC check.

In the next succeeding operation, set to Band 3 for 100 KC, to test for 100 KC; Band 4 for 300 KC; Band 5 for 400 KC, 500 KC and 600 KC checks.

8. Now shift to the "Times 10" (X 10) position of the Frequency Multiplier control, and repeat the above operation for the 100 KC decade (switch to far left of front panel.

9. Upon successful completion of this operation, synthesizer has been completely checked.

10. Check Sideband Converter and Automatic Frequency Control (LFCA) as follows:

a. Leave receiver/synthesizer locked on 600 KC, where last test stopped.

b. Put Channel control of LP4A speaker panel to Channel "B".

c. Using the signal generator to supply 600 KC, supply a test signal for checking. Set the controls on the LFCA thus: MONITOR toward LSB, and METER to LSB. With a strong signal from the generator, listen for the tone signal in the speaker. When heard, advance the GAIN control LSB clockwise, and watch the line level meter. It should move up.

d. Now adjust the signal generator for 0.3μv of signal into the receiver. It should now be possible to adjust the LSB gain control until 0 dbm is achieved.

e. Re-arranging the controls of the LFSB, check the upper sideband in the same fashion.

11. To check AFC performance, set receiver (VLRB) SYNTH switch to "OFF" and mode switch to SSB.

12. On LFCA, set SYNTH switch in the off position (down).

13. Hold the small red button marked AFC on the LFCA in. Move the frequency of the signal generator slowly and carefully around 600 KC (our test frequency), and watch the SYNC light on the LFCA. Stop adjusting the signal generator when red light remains off, and the meter is in about the center of the green. Now, release the button. Signal should be locked in.

14. AFC should hold over deviation of ±5 cycles. To check, hold red button in and carefully move signal generator vernier. As the frequency is moved, the sync level meter should follow the signal. (This test can also be conducted by carefully de-tuning the receiver the required amount.) Check ±300 CPS "IN SYNC" range at 31 KC by inserting signal and varying VLRB tuning very slowly either side of 31 KC. One half division equals 250 CPS. Use extreme care when approaching limits.

15. To Check Signal-plus-Noise/Noise Ratio:

a. Connect Ballantine VTVM across 600 ohm output of VLRB receiver (terminals so marked on terminal strip).

b. Tune receiver to 470 KC. Feed a 470 KC signal from the signal generator into the receiver. To hear this incoming signal, set the control on the speaker pane to Channel A. Set audio gain control to a normal level for local ambient noise, so the receiver can be tuned. Tune receiver for tone, and adjust RF gain control to the point where the Ballantine reads 0.8 V with audio level on maximum. Now remove the signal generator input cable from the receiver input connection, and observe the decrease in meter indication. This should be not less than 15 db change.

c. Repeat the above test on each band as follows:

approximately
Band 4 - 260 KC
Band 3 - 140 KC
Band 2 - 80 KC
Band 1 - 40 KC

Also at frequencies shown on test data sheet.

16. Hum level at full audio output to be greater than -50 DB at USB and LSB 600 ohm output terminals. Apply signal at antenna input and check hum level with sonic analyzer.

17. Audio distortion for two tones at VLRB 600 ohm output to be greater than -40 db. Modulate signal generator with two tones; apply signal to antenna input and read distortion with sonic analyzer.

18. AGC range ±3 db output for 100 db input change. Apply signal at antenna and take out 100 db of attenuation while observing change at VLRB 600 ohm output.

19. BPS power failure switching will be checked by installing necessary batteries, switching all battery switches to "IN" and disconnecting AC input power. All battery lamps should light and units function after delay circuits cut out.

REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S-913 0
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
1/29/65		1 of 5		O- ORIGINAL RELEASE FOR PRODUCTION.	
2/2/65	A	-----	13597	Revised shts. per EMN	