TMC SPECIFICATION			NO. S-845
REV: 0 A B			
COMPILED: RDeV	CHECKED: LEL	APPD: RJR	SHEET 1 OF 10
TITLE:			

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TEST PROCEDURE

for

STR-1

A. EQUIPMENT REQUIRED

1. VOM Simpson Model 260 or equivalent.
2. Audio Signal Generator - HP200, or equivalent.
3. 4 ohm Loudspeaker.
4. HP 410 VTVM, or equivalent.
5. HP 606A RF Signal Generator, or equivalent.
6. TMC Model PTE-3 Spectrum Analyzer, or equivalent.
7. A two-tone RF signal source. TMC model TTG, VOX, SBE-2 or SBE-3, or equiv.
8. Ballantine Model 314 A-C VTVM, or equivalent.
9. Schematic CK-741.
10. Step Attenuator, 50 ohms, TELONIC Model TG 950 or equivalent.
11. 600 ohms resistor - 1 watt.
12. Frequency Counter - HP 524C, or equivalent.
13. BNC "T" adapter UG-274A/U.
14. Sonic Analyzer - LP-1A, or equivalent.
15. AX-436 Extension Module.
16. Test Procedure S-808.
17. One pair of ear phones (600 ohms).

B. WARNING

This unit is a Solid State Device. Any indiscriminate resistance measurement may harm this unit. Make resistance measurements only where and when so indicated.

C. PRELIMINARY

1. All RF modules should be pre-tested per TMC S-808 before being installed into this unit. Install the customer specified RF module into this unit.

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C. PRELIMINARY - Cont'd

2. Inspect the unit for mechanical imperfections such as loose screws, printed circuit boards, cold solder joints etc.

3. With the ohmmeter d-c setting in the + position, measure 130 ohms ±10% from Pin #11 on the AF board to GND. With the ohmmeter d-c setting in the minus (-) position, measure 200 ohms ±10% from Pin #14 on the AF board to GND.

D. POWER

1. Connect the unit to an a-c outlet.

2. Set the power switch to ON. The white light should go on.

3. With the HP VTVM measure +12V ±5% from Pin #11 on the audio board to GND, from Pin #7 on the IF board to GND, and from Pin #1 on the RF board to GND. Also measure -12V ±5% from Pin #14 on the audio board to GND, from pin #8 on the IF board to GND and from Pin #8 on the RF board to GND.

4. Connect the a-c Ballantine between Pin #11 on the AF board and GND. The a-c noise measured should not exceed 1 mv.

5. Repeat Step #5 for Pin #14 on the audio board.

6. Make sure that the removal of the a-c line fuse, the B+ fuse and the B- fuse will make the respective voltages disappear.

7. Measure 115V A-C with the Simpson between Pin #10 and Pin #9 on the RF board.

E. RECEIVER AUDIO CHECK

1. Set the VOLUME control on the front panel maximum clockwise.

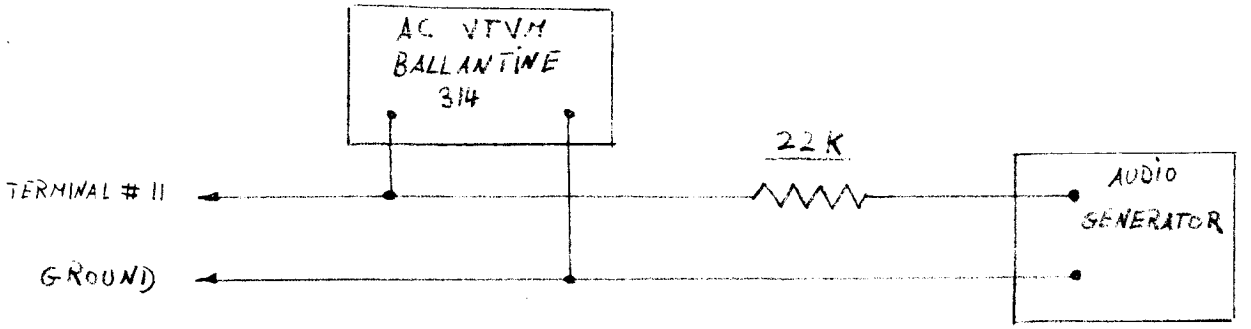
2. Set the power switch to the ON position.

3. Set the SQUELCH control on the rear apron to maximum clockwise.

E. RECEIVER AUDIO CHECK - Cont'd

4. Connect a 600 ohm 1 watt resistor between terminals 3 and 5 on TB1501, and a 4 ohm loudspeaker between terminals 9 and 10 on TB1501.

5. Set the AUDIO SIGNAL GENERATOR at 1 KC and connect to the RECEIVER IF board as shown below with the generator output at zero, and A-C VTVM across input to board.



6. Increase the AUDIO GENERATOR output until a 1 KC tone is heard through the speaker. Insert the phones into J1516. The 1 KC tone should disappear from the speaker and should be heard on the phones. Remove phones.

7. Connect the frequency counter to the arm of potentiometer R1663 on the RCVR IF printed circuit board. The arm of R1663 is accessible through the rear of the printed circuit assembly. The counter should register a frequency of 250 KC ±50 cps. Remove counter.

8. Set the RCVR sideband switch to LSB.

9. Turn R1554 and R1555 fully clockwise.

10. Connect the counter to emitter lead of Q1602 and adjust C1629 for a frequency of 1.5 ±2 cps as registered on the counter. Leave counter connected.

11. Set the RCVR sideband switch to USB/REMOTE.

12. Adjust C1631 for a frequency of 2.0 mc ±2cps as registered on the counter. Remove the counter.

13. Connect the Ballantine A-C VTVM between the collector of Q1610 and GND.

14. Adjust R1663 for a minimum (null) reading on the Ballantine (approx. 110 mv Remove meter.

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E. RECEIVER AUDIO CHECK - Cont'd

15. Connect the HP VTVM between Terminal 9 on the RCVR IF printed circuit board and GND. The meter should read approximately ±.8 volts d-c. Remove meter.

16. Rotate the SQUELCH control maximum counter-clockwise. The tone should abrubtly disappear.

17. Set the AUDIO GENERATOR output for a 10 mv reading on the Ballantine A-C VTVM. Remove meter.

18. Connect the Ballantine across Terminals 3 and 5 on TB1501. The meter should read approximately 780 mv.

19. Connect the Ballantine across Terminals 3 and 4 on TB1501. The meter should read exactly half the voltage obtained in Step 9. Remove meter.

20. Connect the Ballantine across R1660 on the RCVR AF printed circuit board. The meter should read approximately 1.4 volts. Leave meter connected.

21. Rotate the VOLUME control counter-clockwise. The voltage across R1660 should drop porportionately with rotation of the VOLUME control knob. Reset the VOLUME control maximum clockwise, and remove the Ballantine A-C VTVM.

F. RECEIVER IF ALIGNMENT

1. Set the RCVR sideband switch to LSB and remove the mc crystal Y1603.

2. Connect the Ballantine between the base of Q1602 and GND.

3. Connect the HP 606A RF GENERATOR between Terminals 1 and 2 on the RCVR IF board with the generator's output control at zero.

4. Set potentiometer R1612 on the RCVR IF board maximum counter-clockwise.

5. Set the generator frequency at 1.75 mc using the frequency counter, and increase the generator output to approximately 1.0 mv. The Ballantine should indicate some voltage present at the base of Q1602.

6. Adjust C1602 for a peak indication on the Ballantine meter. Peak reading should be 10 mv minimum.

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F. RECEIVER IF ALIGNMENT - Cont'd

7. Reduce generator output to zero and remove meter.

8. Replace the 1.5 mc crystal , Y1603.

9. Connect the Ballantine across terminals 10 and 11 on the RCVR IF board.

10. Set the HP 606A RF GENERATOR to 1.75 mc +1KC as indicated on the frequency counter.

11 11. Check that the SQUELCH control on the rear apron is maximum counter-clockwise.

12. Increase the SIGNAL GENERATOR output for an indication on the Ballantine. Use the 10 mv scale on the meter.

13. Adjust C1655 and C1656 for a peak indication on the meter. Do not allow the meter reading to exceed 10 mv.

14. Set R1554 and R1555 maximum clockwise.

15. Set the SIGNAL GENERATOR output at 260 microvolts and adjust R1612 for a reading of 10 mv on the Ballantine. Remove meter.

16. Connect the Ballantine across terminals 3 and 5 on TB1501. The meter should read .78V with the VOLUME control maximum clockwise. Re-adjust R1612 to obtain this reading if necessary.

17. Set the VOLUME Control maximum counter-clockwise and the SQUELCH control maximum clockwise.

18. Slowly rotate the VOLUME control clockwise. A 1 KC note should be heard through the speaker.

19. Remove the SIGNAL GENERATOR input connections.

G. RECEIVER TESTING - OVERALL

1. Insert TTRR.
2. Set VOLUME control on front panel maximum clockwise.
3. Set sideband selectors to USB.
4. Set SQUELCH control maximum clockwise.

G. RECEIVER TESTING - OVERALL - Cont'd

5. Set power switch to OFF.

6. Connect the HP 606A to the ANTENNA jack, J1502, on the rear apron of the STR-1. Set at zero output.

7. Set the power switch to the ON position.

8. Connect the Ballantine VTVM between Terminals 9 and 10 on the TB1501.

9. Set the signal generator for an output of 100 mv at the operating frequency noted on the receiver converter frequency nameplate.

10. Tune the signal generator for a beat note (e.g. 1kc) on the speaker. Reduce signal generator output until beat note just exceeds noise.

11. Adjust VOLUME control for a comfortable listening level and obtain reading on the Ballantine VTVM.

12. Adjust reciever converter tuning capacitors A through E, in that order, for peak indication on the Ballantine. Signal generator output should be reduced to maintain signal level just above noise.

13. Adjust USB ADJUST, R1555, for a peak reading, and back off slightly. Set. Sideband selector to LSB. Reset the signal generator and adjust LSB ADJUST, R1554, for a peak reading, and back off slightly.

14. Sensitivity-

a. Set output of signal generator to ZERO.

b. Short out CR1607 with a jumper on IF BOARD.

c. Set Ballantine to 1 volt scale.

d. Set VOLUME CONTROL for 0 DB indication on Ballantine.

e. Increase Signal Generator output until Ballantine reads +15 DB.

f. Record output of signal generator in uv on Test Data Sheet (Sensitivity). This is signal + noise-to-noise sensitivity.

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G. RECEIVER TESTING - OVERALL - Cont'd

14. Sensitivity-

g. Remove jumper from CR1607 on IF BOARD.

h. Set signal generator output at 1 microvolt.

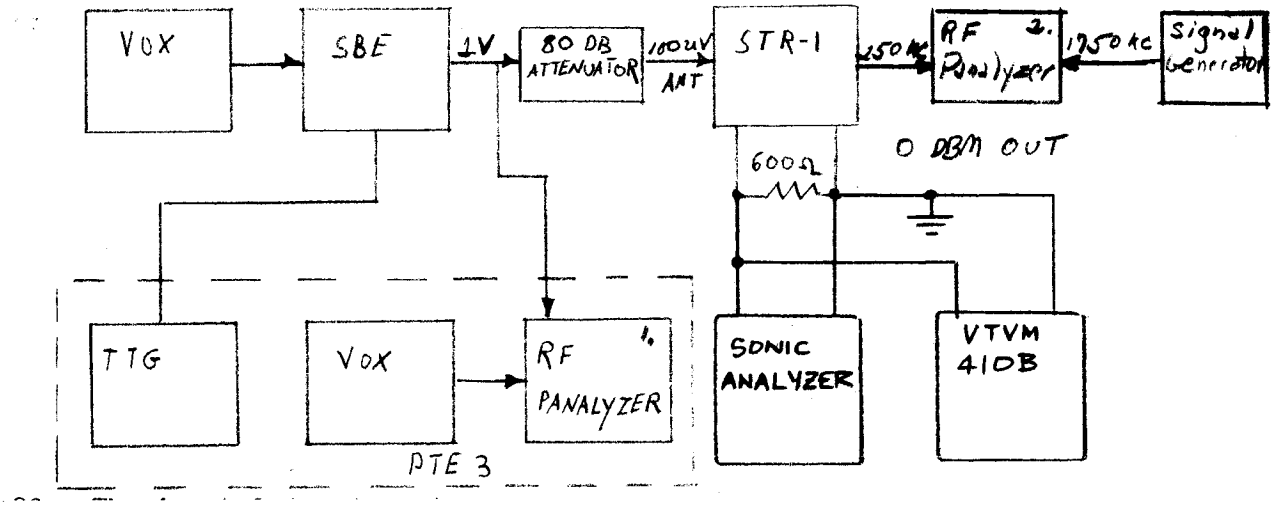
i. Adjust the VOLUME CONTROL to obtain a 0 db reading with the Ballantine set on the 1 volt full scale range.

j. Using the output attenuator on the signal generator, increase the output 100 db to .1 volt. The Ballantine should show an increase in output not greater than +10 db.

k. Set Squelch control to trigger at 1 uv input at Antenna.

15. Intermodulation-

a. Disconnect the signal generator and install additional equipment as shown below:



b. The input 3rd order distortion to the attenuator as part of the SBE output should be more than 40 db below each tone at 1V RMS output. Intermodulation products of STR should be down a minimum of 35 db from PEP of two tones as read on Sonic Analyzer. Check how far down the 3rd order is in DB and record on Test Data Sheet. Disconnect all test equipment.

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G. RECEIVER TESTING - OVERALL - Cont'd

16. Bandwidth-

a. Connect signal generator to ANTENNA INPUT of STR.

b. Set signal generator to 1 uv.

c. Short out CR1607 with a jumper.

d. Connect Ballantine to Terminals 9 and 10 on TB1501.

e. Connect frequency counter to Terminals 9 and 10 on TB1501.

f. Tune signal generator for a peak indication on Ballantine. It should be between 300 and 3300 cycles seen on frequency counter.

g. Slowly tune signal generator lower in frequency until frequency counter reads 300 cycles.

h. The decrease in db on Ballantine should be a maximum of -4 db. Record on Test Data Sheet.

i. Slowly tune signal generator up in frequency to 3300 cycles on frequency counter.

j. DB change from peak should be a maximum of -4 db. Record on Test Data Sheet.

17. Image Rejection-

a. Retune signal generator for peak on Ballantine. Note db reading on Ballantine.

b. Tune signal generator 3.5 mc above TTRR frequency.

c. Increase output of signal generator until image is at same db indication as it was when tuned to TTRR frequency.

d. If TTRR frequency is between 2 and 28 mc, minimum increase in DB of signal generator should be 50 db. If TTRR frequency is between 28 and 32 mc, minimum increase in db of signal generator should be 40 db. Record frequency of TTRR and db increase of sig. gen. output when set 3.5 mc higher than TTRR frequency.

THE TECHNICAL MATERIEL CORP.
MAMARONECK, N.Y.

TEST DATA SHEET - STR-1

SERIAL NO.: _____

MFG. NO.: _____

Mechanical _____ OK

Wiring _____ OK

D-C Power _____ OK

RECEIVER - OVERALL

1 uv into antenna results in _____ mv audio output.

LSB and USB adjust _____ OK

Sensitivity _____ uV

Dynamic Range (100 db) results in _____ DB change in audio output.

3rd Order Distortion _____ DB

Bandwidth: 300 Cycles _____ DB
3300 Cycles _____ DB

Image Rejection Freq. _____ DB

Squelch Set to trigger at _____ uv.

DATE: _____

TESTER: _____

TTRR- _____ MFG. NO: _____ FREQ: _____

REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S-845
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
1/20/67	B	8,10	17713	Revised per EMN	al