DATE 11/20/63	TMC SPECIFICATION NO. S -780	A
SHEET 1 OF 9		
BDV COMPILED / NP CHECKED	TITLE:	
APPROVED RJC		

TEST PROCEDURE VLR-1

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 459M 6444

DATE 11/20/63	TMC SPECIFICATION NO. S -780	A
SHEET 2 OF 9		
RDV COMPILED / NP CHECKED	TITLE: TEST PROCEDURE VLR-1	
APPROVED		

A. TEST EQUIPMENT

1. Signal generator TF 144H, MARCONI INSTRUMENTS LTD or equiv.
2. TEKTRONIX SCOPE Type 545A, Type L Plug-in Unit or equivalent.
3. Counter, HEWLETT PACKARD, Mod. 525A or equivalent.
4. AC VTVM BALLANTINE MO. 314 or equivalent.
5. VTVM HEWLETT PACKARD MO.410 B or equivalent.
6. 24 volt rechangeable NICKEL CADMIUM BATTERY, SONOTONE 19-S103.
7. 1 Pair of EARPHONES (600 ohms or better).
8. RF ATTENUATION BOX. TELONIC MODEL TG-950(50 ohms to 50 ohms)
9. One(1) 2.2K $\frac{1}{2}$ watt load resistor, $\pm$5%.
10. One(1) 4 ohm $\frac{1}{2}$ watt load resisotor, $\pm$5%.
11. Two(2) 300 $\frac{1}{2}$ watt load resistors, $\pm$5%.
12. AC POWER CABLE.
13. BATTERY CONNECTING CABLE.

B. WARNING

This Unit is a solid state device. Any indiscriminate resistance measurements may harm this Unit. Make resistance measurements ONLY where and when so indicated.

C. PRELIMINARY

1. All modules such as : RF, IF, BFO, AUDIO AND POWER SUPPLY, should be pretested before being installed into this Unit.
2. Remove the RF, IF, BFO, and AUDIO modules temporarily.
3. Inspect the Unit for mechanical imperfections such as loose screws, printed circuit boards, cold-solder joints, etc.
4. With the ohmmeter DC setting in the + position, measure 4.5K$\pm$10% ohms from either +12V or -12V lines to GROUND.

D. DC POWER

1. Set BATTERY switch S305 to the OUT position.
2. Set POWER switch S302 to the OFF position.
3. Connect the AC Power cable between an AC outlet and MAIN AC J319 on the Unit.
4. Connect the Battery connecting cable between BATTERY input J315 on the Unit and Battery.

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5. Set the POWER switch to the ON position. The GREEN power light should go on.
6. Measure +12V±10% from any B+ point to GND.
7. Measure -12V±10% from any B- point to GND.
8. Set BATTERY switch to the IN position.
9. Measure -13V±10% from any B- point to GND.
10. Measure +12V±10% from any B+ point to GND.
11. Remove the Battery cable from the Unit.
12. Measure -17V±10% from any B- point to GND.
13. Reconnect the Battery cable to the Unit.
14. Set the POWER switch to the OFF position.
15. The GREEN Power light should go off and the RED Battery light should go on instantaneously.
16. Measure voltages as in steps #9 and #10.
17. Set the Battery switch to the OUT position. The Battery light should go off.

E. GENERAL OPERATION

1. Insert the BFO, IF, and AUDIO modules into Unit. Also insert the 10 RF modules, specifically assigned to this Unit, into the Unit.
2. Connect the 4 ohm load resistor from Pin #1 to Pin # 2 on E301.
3. Connect the two(2) 300 ohm load resistors from Pin #6 to Pin #5 and from Pin #5 to Pin #4 respectively.
4. Terminate J317 with the 2.2K load resistor.
5. Make sure that the white indicator line on the BFO knob points to 0 when the capacitor plates are fully meshed.
6. Turn the POWER switch on.
7. With BFO capacitor C304 fully meshed, connect the counter to Pin #11 on J312.
8. After a warm up period of five(5) minutes, adjust trimmer C311 to obtain 3KC $^{+5cps}_{-0cps}$ on the counter.
9. With an unterminated antenna input J318, turn CHANNEL SELECTOR to any operating channel.
10. Set AGC to manual, and adjust RF GAIN, AF GAIN, and BFO to obtain a rushing noise in the earphones.
11. Set the meter switch to the RF position.
12. Turn RF ZERO SET R306, until the meter needle moves from a "minus 0" reading to exactly "0". Lock R306.
13. Inject .luv. CW. @ the operating frequency, from the sign l g n rator, to the ANT input J318.
14. Turn RF GAIN to approximately 3/4 clockwise.
15. Connect the AC VTVM across the 600 ohm LINE.

16. Turn LINE LEVEL to obtain 0.DBM = .78V across the 600 ohm line.
17. Set meter switch to the AF position.
18. Adjust AF CALIBRATION R311 until the meter needle rests on 0.DBM. Lock R311.

F. BFO RANGE

1. Connect the counter across the 600 ohm line,(to monitor AF output).
2. Turn BFO from 0 to approximately 2 o'clock. The frequency should change from zero to approximately 2500 cps. (At this time, the meter needle should have fallen to approx. -3DBM.
3. When turning the BFO further toward 3KC, the meter needle should fall off rapidly and reach 0.DB @ approx. 2:30 o'clock.

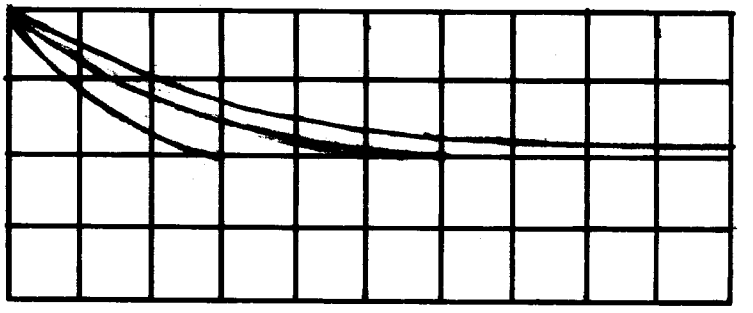
G. AGC DECAY RANGE

1. Set the scope input to the DC position and the Volt/cm control to .1 Volt/cm.
2. Set the time base control to 1cm/second.
3. Connect a shielded cable from the vertical scope input to
4. Turn AGC to FAST.
5. Adjust vertical position so that the slow moving point on the scope travels on the first line from the top of the scope.
6. Disconnect the .1uv signal.
7. Adjust the Red variable knob on Volts/cm so that the moving point travels on the third line from the top. Reconnect signal generator. This step will affect step #4. Readjust,back and forth,to obtain desired effect.
8. Disconnect SIGNAL GENERATOR,at the same instant that the moving point on the scope reaches the first vertical line on the scope.
9. Observe the point moving exponentially downwards towards the third line.
10. Count the number of cm(squares) it takes the moving point to reach the third line.

11. In the **FAST** position, the number of cm should be approx. 3 cm.
In the **MED.** position, the number of cm should be approx. 7 cm.
In the **SLOW** position, the number of cm should be approx. 14 cm.

NOTE: Tolerances of above ±1/2 cm.

SEE ILLUSTRATION:



H. DYNAMIC RANGE

1. Connect scope and AC-VTVM across 600 ohm line.
2. Increase input from .1uv to +80DB; the output should not increase by more than 3DB.
3. Observe clean sine wave @ the above steps.
4. Connect the AC VTVM and scope across the 4 ohm loudspeaker load.
5. With an antenna input of .1uv, adjust the AF GAIN to obtain 1.4V(.5 watts) across the 4 ohm load.
6. Repeat steps 2 and 3 from above.

I. MANUAL RF

1. Turn AGC to MAN. RF, RF Gain full CCW, and AF gain full CW.
2. With an antenna input of .1 uv, adjust the RF GAIN to obtain 1.4V across the 4 ohm load. This output should be obtained with the RF GAIN approximately set at 3/4 clockwise

J. PHONE OUTPUT

1. Connect earphones and , listen to an audio frequency tone (dependent on BFO setting).
2. Increasing or decreasing the AF GAIN should have a corresponding effect on the tone instensity.

K. TRF OUTPUT

1. Connect the scope and the AC VTVM to J317 and GND.
2. Turn AGC DECAY to FAST.
3. Inject 1. uv at the operating frequency into the antenna.
4. Read 10.mv ± 2.mv on the AC VTVM and observe a sine wave on the scope.
5. Disconnect generator, the sine wave should disappear.

L. S+N/N RATIO (SENSITIVITY)

1. Connect AC VTVM across the 600 ohm LINE
2. Inject .luv into the antenna and set the AGC DECAY to MAN RF. Then set the RF GAIN full CW, and LINE LEVEL to obtain 1V. on the AC VTVM.
3. Interrupt the carrier on the signal generator. Now the AC VTVM needle should drop to -10 DB or more.

M. RF CHANNEL LEVELS

1. Turn the AGC DECAY to FAST; the AF GAIN full clockwise and the BFO to 2kc (12.o'clock).
2. Turn CHANNEL SELECTOR to channel #1 and inject .luv @ a frequency, corresponding to channel #1, into the antenna input.
3. Adjust the LINE LEVEL to obtain O.DBM on the Unit's meter when the meter switch is set to AF. This output should be obtained with LINE LEVEL set to no more than 3/4 clockwise.
4. Repeat steps 2 and 3 for every RF Head by turning the CHANNEL SELECTOR to all 10 channels, one at a time, and by injecting the appropriate frequency into the antenna.
5. If there are any dummy RF modules in the Unit, remove them temporarily for this test; and replace them with any one of the operational RF modules: and repeat steps 2 and 3. This will insure that the unused channels operate correctly.

N. SIGNAL CONTINUITY WITH POWER SOURCE CHANGE

1. Connect a signal generator to the antenna input.
2. Set AGC DECAY to SLOW,BFO to 2KC,AF GAIN to 12 O'clock, and Battery switch to the IN position.
3. Turn CHANNEL SELECTOR to any channel and tune generator to channel frequency.
4. Listen to the tone on the earphones and switch the POWER off. There should be no interruption whatsoever,of the tone when the switching occurs,and the tone level should not change by more than 2DB as can be observed on the AF meter.
5. Switch Power on. The same results should occur in this step as in step #4.

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THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y.

VLR-1 TEST DATA SHEET #1

SERIAL NO._____

MFG. NO._____

Mechanical_____ok
Wiring _____ok

DC POWER

With POWER switch ON, POWER light should be on_____ ok
B+voltage+12v.± 10%_____ volts
B-voltage -12v.±10%_____ volts
With BAT switch IN., B-voltage, -13V. ± 10%_____volts
With POWER switch OFF, POWER light should be off
and BATTERY light should be on_____ ok
With BAT switch OUT, the BATTERY light should be out_____ ok

GENERAL OPERATION

BFO capacitor adjustment_____ok
AF-RF meter adjustment_____ok
BFO_____ok

AGC-DECAY RANGE

FAST position_____ ok
MEDIUM position_____ ok
SLOW position_____ ok

AGC-DYNAMIC RANGE

For an 80 DB change in input, output change not more
than 3 DB_____ DB
AGC-MAN RF position_____ok
PHONE OUTPUT_____ok

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VLR-1 TEST DATA SHEET #2

TRF OUTPUT

For a .luv input, output at J317, 10mv ± 2mv_____MV

S+N/N RATIO (SENSITIVITY)

For .luv input and 1V. output at 600ohm LINE terminals, noise ratio should be -10 DB or better_____DB

RF CHANNEL LEVELS _____ ok

SIGNAL CONTINUITY WITH POWER SOURCE CHANGE

With POWER switch OFF, signal change on AF meter not more than 2 DB _____ DB

With POWER switch ON, signal change on AF meter not more than 2 DB _____ DB

DATE_____

TESTER_____

MODULE MFG.NO

AX424(BFO)_____

AX425(IF)_____

AX431(AF)_____

AX433(P/S)_____

RF MODULE(AX432)

CH1_____ CH9_____

CH2_____ CH10_____

CH3_____

CH4_____

CH5_____

CH6_____

CH7_____

CH8_____

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REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S780
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
10/30/64	A	all	12792	Revised all shts. per EMN	