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TITLE:				

Typed by mtp 6/23/66

COMPLETE INSTRUCTIONS FOR THE PRODUCTION TESTING OF THE MODEL RFA-1B

1. TEST EQUIPMENT REQUIRED

   a. TMC VOX and SBE.

   b. HP VTVM or equivalent.

   c. TMC Spectrum Analyzer, PTE.

   d. 50 ohm, 500W Load.

   e. RF Ammeter 0-5A scale, or Bird Model 43 Wattmeter.

   f. PSP-350B Power Supply.

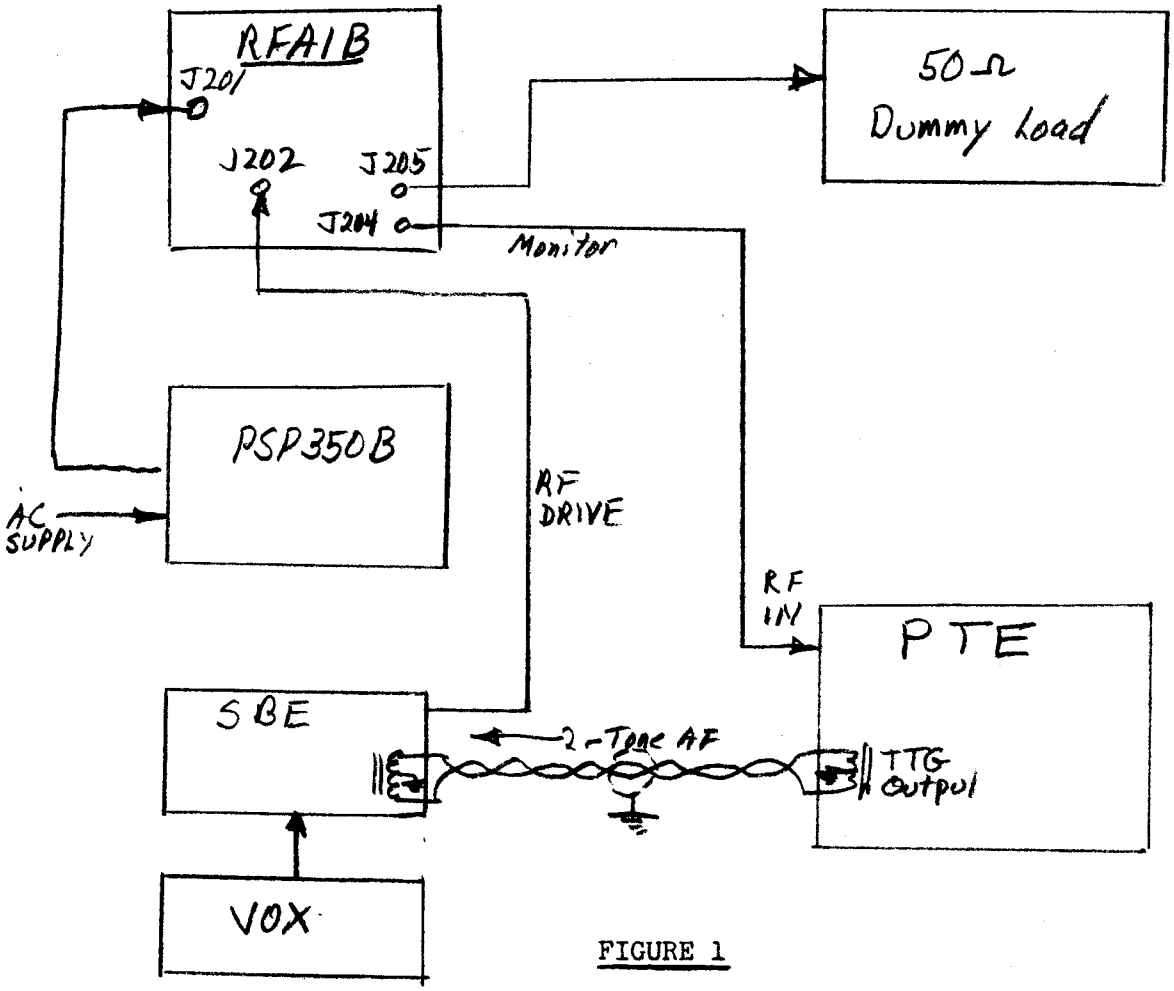

FIGURE 1

2. RFA-1B AND TEST EQUIPMENT HOOKUP

NOTE: a. Feed the HF drive directly out of the VOX to the RFA-1B during alignment tests.

2. RFA-1B AND TEST EQUIPMENT HOOKUP - Cont'd

NOTE: b. To minimize undesired pickup during S/D tests, the 2-tone AF should be run with a shielded twisted twin lead. The SBE AF input and TTG AF output should be connected for "BALANCED" line operation with the center taps tied to the shield of the cable and grounded to th TTG and SBE chassis.

3. TEST INSTUCTIONS

a. Proceed with the test as outlined in Test Sequence and Procedure, Paragraph 4 to follow.

b. Fill in blanks on report sheet, rejecting those units which do not meet specifications stated herein.

c. Sign report sheets and submit them to your supervisor.

4. TEST SEQUENCE AND PROCEDURE

A. General Inspection

1) Inspect the unit for obvious mechanical and electrical imperfections.

2) Inspect all the relative positions of variable capacitors C205, C213 and C276 with respect to dial settings. The dials must read zero when capacitors are fully meshed (extreme counter-clockwise positions).

3) Visually inspect the pressurized compartment for "shorts" from components to ground as well as between the component parts.

All RF connections must be as short as physically possible.

NOTE: Do not enclose the pressurized compartment until resistance check has been performed.

4) Visually inspect the driver chassis for "shorts" of component parts, and make sure that all RF connections were kept as short as physically possible.

5) Inspect all the RF wiring of S202, T208, T209, C213, C276 and C273.

B. Blower Wiring

Blower must be wired in accordance with schematic CK-1002 C268 must be 1 mfd. All connections are color coded.

NOTE: If power applied, the improperly wired blow r will be damaged.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

C. Resistance Check

WARNING: Place a bus wire across the meter terminals and disconnect the RED lead from M202, Multi-Meter (50 micro-ampmeter) before measuring resistances with an ohmmeter, otherwise the meter will be permanently damaged.

1) J201:

PIN	TO	OHMS	REMARKS
1	- Terminal of M202	Short	S203 in H.V. position
2	Pin 7 of J202	3 to 6 ohms	F201 must be inserted
3	Ground	14-16 Meg.	S203 in PA SG position
4	Ground	M201 must read	
5	Ground	20K-38K	
6	N.C.		
7	Ground	Short	F201 must be inserted
8	Ground	190K-250K	
9	Ground	Open	
10	Ground	Open	With S204; S205 in closed position
11	To Pin 10 of J201	Short	With S204; S205 in closed position.
12	Ground	Short	
A-1	Ground	Open	

2) Pressurized Compartment

WARNING: Do not place ohmmeter leads to other point than indicated in the chart below, otherwise the germanium diodes CR204 and CR205 may be damaged.

FROM	TO	"R" LIES BETWEEN THE VALUES OF:	REMARKS
Pin 1 of V203	C259	3 1/2 to 4 1/2 ohms	Be certain that ohmmeter leads are making good contacts.
Pin 1 of V203	Pin 1 of V2	2 to 3 ohms	R213 and R221 set in extreme CCW position.

3) Reconnect the RED lead on M202, Multi-meter.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

D. Initial Power Check

1) Connect power supply unit, PSP-350B, to unit under test as shown in general instrument layout, Figure 1. DO NOT apply RF drive.

2) Be sure that transmitter plates switch and high voltage breaker are OFF.

3) Turn the main line breaker to ON position and note if all filaments operate.

4) Quickly go through all positions of metering switch observing multi-meter. No meter readings should be seen except in filament position.

5) Meter switch in filament position, reset filament adjust pot. R216 to "FIL ADJUST" mark on multi-meter, (equivalent of 6 volts).

6) Set bias controls R213 and R221 to full counter-clockwise position.

7) Measure voltage to ground from Pin C of V203 -- must be 90V to 115V.

8) Measure voltage at Pin 2 of V201 -- must be 147V to 163V.

9) Pull out all the interlocks: S204 and S205.

10) Turn on the transmitter plates switch; the transmitter plates indicator lamps must go on.

E. Voltage Check

1) With VTVM, check following voltages:

FROM	TO	VOLTAGE
Plate Cap	Ground	90 to 150V
Pin 6 of V201	Ground	90 to 150V
Pin 3 of V202	Ground	40 to 70V
Pin 4 of V202	Ground	-120 to -130V
Pin 5 of V202	Ground	-140 to -150V
Pin 2 of V201	Ground	-145 to -155V
Pin 1 of V201	Ground	-140 to -150V

2) Turn off the power and place cover on the bottom of pressurized compartment.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

F. Alignment of Driver Chassis

1) Place special cover (with holes) over driver chassis. Place special cover on bottom of unit. Tighten all screws.

2) Turn on the main power.

3) After 60 seconds turn on the transmitter plates switch.

4) Check the PA filament voltage (reset if necessary, R216, "FIL ADJUST").

5) Set the multi-meter switch to RF DR position.

6) Set all trimmers to their midway capacity.

7) Set the driver band switch to 2-4 mcs position.

8) Set driver tuning at point No. 1.

9) Apply drive slowly at 2 mcs (carrier).

10) Tune T201 and T204 to the peak indication on the multi-meter reducing the drive to maintain reading of approximately 5.

11) Apply drive slowly at 4 mcs.

12) Set driver tuning at point #9.

13) Tune trimmers C201 and C207 to the peak indication on multi-meter; readjust drive to maintain a reading of 5 on multi-meter.

NOTE: Remove drive. If multi-meter continues to read, readjust C223 and start from Step #8.

14) Repeat Steps #7 through #10 several times until no further adjustment of coils and trimmers is necessary.

15) Set driver band switch to 4-8 mcs position.

16) Set driver tuning at point No. 1.

17) Apply drive slowly at 4 mcs (carrier).

18) Tune T202 and T205 to the peak indication on multi-meter.

19) Apply drive slowly at 8 mcs.

20) Set driv r tuning at point No. 9.

21) Tune trimmers C202 and C208 to the peak indication on the multi-meter.
NOTE: Check for oscillation as in the note after Step #14.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

F. Alignment of Driver Chassis

22) Repeat Steps 16 through 21 several times, until no further adjustment of coils and trimmers is necessary.

23) Set driver bandswitch to 8-16 mcs position.

24) Set driver tuning at point No. 1.

25) Apply driver slowly at 8 mcs (carrier).

26) Tune T203 and T206 to the peak indication on multi-meter.

27) Apply drive slowly at 16 mcs.

28) Set driver tuning at point No. 9.

29) Tune trimmers C204 and C211 to the peak indication on the multi-meter.

NOTE: Check for oscillation as in the note after Step #14.

30) Repeat Steps 16 through 29 several times until no further adjustment of coils and trimmers is necessary.

31) Set driver switch to 16-32 mcs position.

32) Set driver tuning at point No. 1.

33) Apply drive slowly at 16 mcs (carrier).

34) Tune L208 and T207 to the peak indication on the multi-meter.

35) Apply drive slowly at 32 mcs.

36) Set driver tuning at point No. 9.

37) Tune trimmers C203 and C210 to the peak indication on the multi-meter.

NOTE: Check for oscillation as in the note after Step #14.

38) Repeat Steps #31 through #37 several times until no further adjustment of coils and trimmers is necessary.

39) Lock all coils observing the multi-meter.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

F. Alignment of Driver Chassis

40) Repeat Steps #7 through #37 but setting driver tuning at point No. 9 only and retuning trimmers only.

NOTE: It is of the utmost importance that the driver chassis be aligned with great care. Inadequate gain in these stages will originate an appreciable amount of distortion.

41) Turn off the transmitter plate switch.

G. Neutralization of P.A.

WARNING: Be certain that overload breaker stays in OFF position throughout the neutralization process.

1) Turn ALDC ADJUST to extreme counter-clockwise position.

2) Connect VTVM to the plates of power amplifiers.

3) Set P.A. loading at point No. 0.

4) Disconnect lead from C215.

5) Turn on transmitter plates switch.

6) Apply drive at 32 mcs (carrier), tuning the driver stages to the peak meter indication in RF DR position. Adjust the drive control approximately 5 volts on multi-meter.

7) Set PA bandswitch to 24-32 mcs position.

8) Tune PA tuning to peak indication on RF VTVM.

9) Adjust PA neutralizing capacitor C214 each time retuning PA tuning to the peak until pak and dip coincide (should be less than 1 volt RMS).

10) Apply drive at 16 mcs and tune the driver stages to the peak indication in RF DR position. Adjust the drive control until a reading of 10 on multi-meter is obtained.

11) Set the PA bandswitch to 16-24 mcs position.

12) Tune PA tuning to the peak indication on RF VTVM. The reading must not exceed 1 volt RMS.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

G. Neutralization of PA

13) Set up the unit at 2 mcs. The reading on VTVM must not exceed 1 volt RMS. If more than 1 volt RMS, readjust the neutralizing capacitor C214, and recheck at 32 mcs.

14) Disconnect VTVM and remove drive.

15) Turn off the transmitter plate switch.

16) Connect the feedback cable to C215.

H. Adjustment of PA Bias

1) Be certain that V203 Bias and V204 Bias control potentiometers are in extreme counter-clockwise position, and switch S206 is in SSB position.

2) Disconnect the exciter from J202.

3) Turn on the transmitter plate switch.

4) Turn on the high voltage breaker.

5) Turn V203 Bias control potentiometer slowly clockwise until the PA plate current will read 90 ma, and lock the potentiometer.

6) Turn V204 Bias control potentiometer slowly clockwise until the PA plate current will read 160 ma, and lock the potentiometer.

7) Set the multi-meter switch to PA HV position. The multi-meter must read approximately 2000 VDC.

8) Turn off the transmitter plate switch.

I. Spurious Test

NOTE: DO NOT connect a load and drive to the unit for this test.

1) Turn on the transmitter plate switch.

2) Turn on the high voltage breaker.

3) Tune the driver stages and the PA at approximately 2 mcs. Move tuning knobs slightly, observing the PA plate current and RF DR.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

I. Spurious Test

4) Continue to rotate driver tuning and PA tuning knobs throughout the band, keeping the driver tuning frequency and the PA plate frequency approximately the same. Switch bands and check all frequencies up to 32 mcs.

NOTE: If there is a sudden jump in PA plate current and RF DR during the tests in Steps 3 and 4:

a. Determine the parasitic frequency.
b. If it is grid-to-plate oscillation, then the unit must be re-neutralized.

J. PA Performance and Intermodulation

1) Distortion Test:

a. Set up the equipment as described in Figure 1.

b. Set up the unit for all operations, using two tone signal from exciter. Set the bandswitches as per chart below; the voltage across the 52 ohm load must be 140V as measured with Hewlett-Packard VTVM.

The third and fifth order products may not be less than 40 db below fundamental tones.

F	Driver Band	PA Band
2	2 - 4	2.0 - 2.5
2.5	2 - 4	2.5 - 3.0
3.0	2 - 4	3.0 - 4.0
4.0	4 - 8	4.0 - 6.0
6.0	4 - 6	6.0 - 8.0
8.0	8 - 16	8.0 - 12
12	8 - 16	12 - 16
16	16 - 32	16 - 24
24	16 - 32	24 - 32
32	16 - 32	24 - 32

The multi-meter reading must be as follows at each frequency:

Sw. Pos	Value
ISG	-8 to -10 ma
RF DR	Approx. 5
RF PL	Approx. 800 V
RF OUT	Approx. 140 V

c. If the above test is acceptable, proceed immediately to the next test.

4. TEST SEQUENCE AND PROCEDURE - Cont'd

K. ALDC Adjustment

1) While the unit is still fully tuned at some frequency, turn slowly clockwise the ALDC adjustment potentiometer until the output will just begin to drop off.

2) Increase the drive from the exciter. The output must increase only slightly.

3) Turn off all the power.

L. Class "C" Operation

1. Throw switch S206 to clockwise position. Plate current should be ZERO.

2. Increase drive until plate current reads 300 ma. RF drive should read approximately 5 on the multi-meter. Record power output (approximately 350 watts average).

3. Vary ALDC ADJUST and return to original setting. There should be no change in plate current.

TEST REPORT SHEET

for

MODEL RFA-1B

A. GENERAL INSPECTION _____ OK

B. BLOWER WIRING _____ OK

C. RESISTANCE CHECK _____ OK

D. INITIAL POWER CHECK _____ OK

E. VOLTAGE CHECK _____ OK

F. ALIGNMENT OF DRIVER CHASSIS _____ OK

G. NEUTRALIZATION OF P.A. _____ OK

H. ADJUSTMENT OF PA BIAS _____ OK

I. SPURIOUS TEST _____ OK

J. PA PERFORMANCE AND INTERMODULATION PERFORMANCE TEST -- Intermod. Dist. - _____ DB MAX.

K. ALDC ADJUSTMENT _____ OK

L. CLASS "C" OPERATION -- Power Output _____ WATTS

SERIAL NUMBER _____ ACCEPTED _____

DATE _____ TESTED BY _____

REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S 1094
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION Sheet 13 of 13	APP.
6/27/66	Ø			ORIGINAL RELEASE FOR PRODUCTION	

TMC FORM MLR-1 2-65—AINS.