

DATE 7-26-61  
SH. 1 OF 10  
COMPILED BY  
S.D.

TMC SPECIFICATION NO. S-590

TITLE: TEST PROCEDURE FOR TMC MODEL VOX-5

JOB A

APPROVED

STEP

I. POWER SUPPLY:

A. PRELIMINARY PROCEDURE

1. Inspect power supply for any electrical or mechanical imperfections.
2. Check correctness of METER knob indication.
3. Check power supply for proper insertion of tubes, capacitor and fuses.
4. If there are any errors in the above, return the power supply to production for correction.
5. With the power supply removed from the VOX-5, connect all cables as shown in FIGURE 1.
6. Insert a 455KC xtal in each BFO xtal socket (Y101 and Y102).
7. Connect a 1000 ohm load to the BFO output jack (J102 or J103 or J104).
8. Connect power supply line cord to a 115VAC power source.
9. Turn POWER switch ON.
10. Remove POWER fuse (F102). All lamps on the front panel of the VOX-5 should go out, indicating no power. Replace fuse. Record result on test data sheet.
11. Remove OVEN fuse (F101). The two oven lamps on the front panel of the VOX-5 should go out. This indicates proper fusing of the VOX-5 ovens. Replace fuse. Record result on test data sheet.

B. POWER SUPPLY VOLTAGE CHECK

NOTE: All voltages taken to ground with a HEWLETT PACKARD VTVM MODEL 410B.

1. B+ SUPPLY:

- a. +300 VDC between pin 5 of C102A and ground.
- b. +150 VDC between pin 1 of V102 and ground.

2. FILAMENT:

- a. 6.3 VAC between pin 3 of V103 and ground  $\pm$  10%.
- b. 6.3 VAC between pin 4 of V104 and ground  $\pm$  10%.
- c. 6.3 VAC between pin 3 of V105 and ground  $\pm$  10%.

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3. BALLAST:
  - a. 12 VAC between pin 2 of R119 and ground  $\pm$  10%.
  - b. 6.2 VAC between pin 8 of R119 and ground  $\pm$  10%.
4. If all voltages are correct, indicate this by placing a check mark in the space provided on the test data sheet.

II. ALIGNMENT OF BFO:

- A. BFO switch ON.
- B. METER switch in BFO position.
- C. BFO XTAL SW in Y101 position.
- D. Adjust R116 for a reading of 0.32 MA. on the front panel meter.
- E. Set BFO XTAL SW in Y102 position.
- F. Meter reading should be approximately 0.32 MA.
- G. Connect the 1000 ohm load across each BFO output jack in turn and monitor the output with the VTVM. This procedure will insure that proper electrical connection is made to each output jack.
- H. Record result of test in the space provided on the test data sheet.

III. ALIGNMENT OF HFO:

A. PRELIMINARY PROCEDURE

1. Check correctness of all knobs, being sure they indicate correctly.
2. Insert a 2 MC xtal in Y204 xtal socket (XTAL switch position NO. 1).
3. Insert a 4 MC xtal in Y203 xtal socket (XTAL switch position NO. 2).
4. Set METER switch in HFO position.
5. Place HFO switch ON.

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6. Set XTAL FREQ control in 0 position.
7. Turn OUTPUT control fully clockwise.
8. Connect a 70 ohm load across HFO output jack. (J208 or J209 or J210).
9. Connect the A.C. probe of the VTVM across the 70 ohm load.
10. Set trimmers C235, C232, C227 and C224 to their mid capacity range.
11. Place XTAL switch to position NO. 1.
12. Set TUNING control to 2 mcs.
13. Adjust XTAL FREQ control to maximum output.
14. Align low end of band as per TABLE I in the order given.

## B. ALIGNMENT PROCEDURE

TABLE I

### ALIGNMENT OF LOW END OF BANDS

STEP	BAND-MCS POSITION	FREQ. MC.	PEAK	VTVM RF VOLTS	PANEL METER MA.
1	2-4	2	L203	13	0.7
2	4-8	4	L205	9	0.5
3	8-16	8	L206	8	0.4
4	16-32	16	L207	7	0.35
5	32-64	32	L208	6	0.25

1. Repeat the above until proper alignment of the low end is assured. Record readings obtained on test data sheet.
2. Place XTAL switch to position NO. 2.
3. Set TUNING control to 4 mcs.
4. Align high end of band as per TABLE II in the order given.

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TABLE II

ALIGNMENT OF HIGH END OF BANDS

STEP	BAND-MCS POSITION	FREQ. MC.	PEAK	VTVM RF VOLTS	PANEL METER MA.
1	2-4	4	C224	12	0.7
2	4-8	8	C224	6	0.3
3	8-16	16	C227	8	0.4
4	16-32	32	C232	10	0.5
5	32-64	64	C235	9	0.4

Record readings obtained, on test data sheet.

- Repeat the above until proper alignment of the high end is assured.
- Check that the TUNING control peaks on 2 MC and 4 MC, on all positions of the BAND-MCS switch and also all positions of the XTAL switch.
- If TUNING control does not peak on 2 MC and 4 MC for all positions mentioned above, repeat alignment procedure.
- Insert the 2 MC xtal in Y202 xtal socket (XTAL switch position NO. 3).
- Place XTAL switch to position NO. 3.
- Set tuning control to 2 MC and observe output. This procedure insures proper operation of Y202.
- As a final check of the HFO, connect the 70 ohm load across each HFO output connector in turn and meter each output. This procedure will show that proper electrical connection is made to each output jack.

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IV. ALIGNMENT OF IFO

A. PRELIMINARY PROCEDURE

1. Insert a 3.5 MC xtal in Y201 xtal socket.
2. Connect a 70 ohm load across IFO output jack (J205 or J206 or J207).
3. Place the AC probe of the VTVM across the 70 ohm load.
4. Place IFO switch ON.
5. Place METER switch to IFO position.

B. ALIGNMENT PROCEDURE

1. Tune L201 for maximum output.
  - a. RF OUTPUT --3.5 VOLTS.
  - b. PANEL METER - 0.3 MA.
  - c. Record results in the space provided on the test data sheet.
2. As a final check of the IFO output, connect the 70 ohm load across each IFO output connector in turn and meter the output. This procedure will insure that proper electrical connection is made to each output jack.

C. 3.5 MC OSCILLATOR CHECK

1. Connect a RF jumper between J205 and J203.
2. Place BAND-MCS switch to 2-4 MCS position.
3. Place METER switch to HFO position.
4. Place IFO switch ON.
5. Place HFO switch ON.
6. Place XTAL switch to VMO position.
7. Vary TUNING control for a peak on panel meter. Peak should occur at 3.5 MC indicated by TUNING control. Record result of test by entering a check mark in the space provided on the test data sheet.

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## V. CALIBRATION CHECK OF MASTER OSCILLATOR

### A. PROCEDURE

1. Place XTAL switch in VMO position.
2. Place METER switch in HFO position.
3. Place BEAT switch in ON position.
4. Turn MO dial for ZERO BEAT and measure output voltage at phone jack with VTVM (18 to 24V).
5. Place BAND-MCS switch in 4-8 MC position.
6. Set TUNING control to 2.5 MC.
7. Tune a receiver for WWV (5 MC).
8. Monitor frequency with a HEWLETT PACKARD FREQUENCY COUNTER.
9. Set MO dial for 2.5 MC and zero beat on the receiver. This can be observed by the fluctuations of the S-meter at the difference frequency.
10. Plug in ear phones (J106) and adjust C311 for a zero beat.
11. Set MO dial to 2000 KC. Adjust CALIBRATE control for zero beat.
12. Set MO dial to 4000 KC. Adjust trimmer through hole near CALIBRATE dial for zero beat. (use a receiver to make sure that it is 4 MC).
13. Repeat steps 11 and 12 as many times as is necessary until the 2 MC and 4 MC positions on the dial are exactly on frequency.
14. The amount of error at every 100 KC on the dial between 2 MC and 4 MC, should not exceed 200 cycles.  
Record cycles deviation for every 100 KC between 2 MC and 4 MC in the space provided on the test data sheet.

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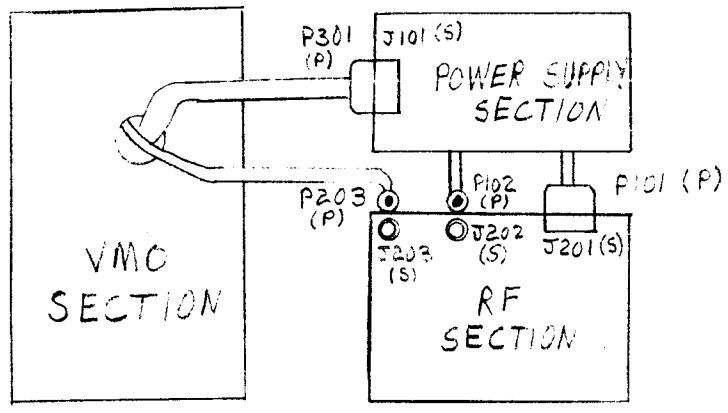


FIGURE 1

CABLE CONNECTIONS

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TITLE:

VOX-5 TEST DATA SHEET

JOB

A

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POWER SUPPLY CHASSIS

VOX SERIAL NO. \_\_\_\_\_

POWER SUPPLY NO. \_\_\_\_\_

STEP

TEST

I - A10

POWER FUSE \_\_\_\_\_ OK

I - A11

OVEN FUSE \_\_\_\_\_ OK

I - B

POWER SUPPLY VOLTAGES \_\_\_\_\_ OK

II

BFO ALIGNMENT \_\_\_\_\_ OK

DATE \_\_\_\_\_

TESTED BY \_\_\_\_\_



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TITLE: VOX-5 TEST DATA SHEET

JOB A

APPROVED \_\_\_\_\_

RF CHASSIS \_\_\_\_\_

VOX SERIAL NO. \_\_\_\_\_  
RF CHASSIS NO. \_\_\_\_\_

<u>STEP</u>	<u>TEST</u>			
III - B	MULTIPLIER OUTPUT (HFO)			
	BAND	FREQ. MC	RF OUTPUT VOLTS	PANEL METER MA
	2-4	2	_____	_____
	4-8	4	_____	_____
	8-16	8	_____	_____
	16-32	16	_____	_____
	32-64	32	_____	_____
	2-4	4	_____	_____
	4-8	8	_____	_____
	8-16	16	_____	_____
	16-32	32	_____	_____
	32-64	64	_____	_____

IV - B1 IFO OUTPUT  
RF OUTPUT \_\_\_\_\_ RF VOLTS  
PANEL METER \_\_\_\_\_ MA

IV - C7 3.5 MC OSCILLATOR CHECK \_\_\_\_\_ OK

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TESTED BY \_\_\_\_\_

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MASTER OSCILLATOR

VOX SERIAL NO. \_\_\_\_\_

CONDENSER NO. \_\_\_\_\_

STEP

TEST

V - A4

ZERO BEAT INDICATION \_\_\_\_\_ OK

AUDIO OUTPUT \_\_\_\_\_ AC VOLTS

V - A14

CALIBRATION

FREQUENCY KC

CYCLES DEVIATION

2000  
2100  
2200  
2300  
2400  
2500  
2600  
2700  
2800  
2900  
3000  
3100  
3200  
3300  
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4000

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