

ALIGNMENT AND ADJUSTMENT

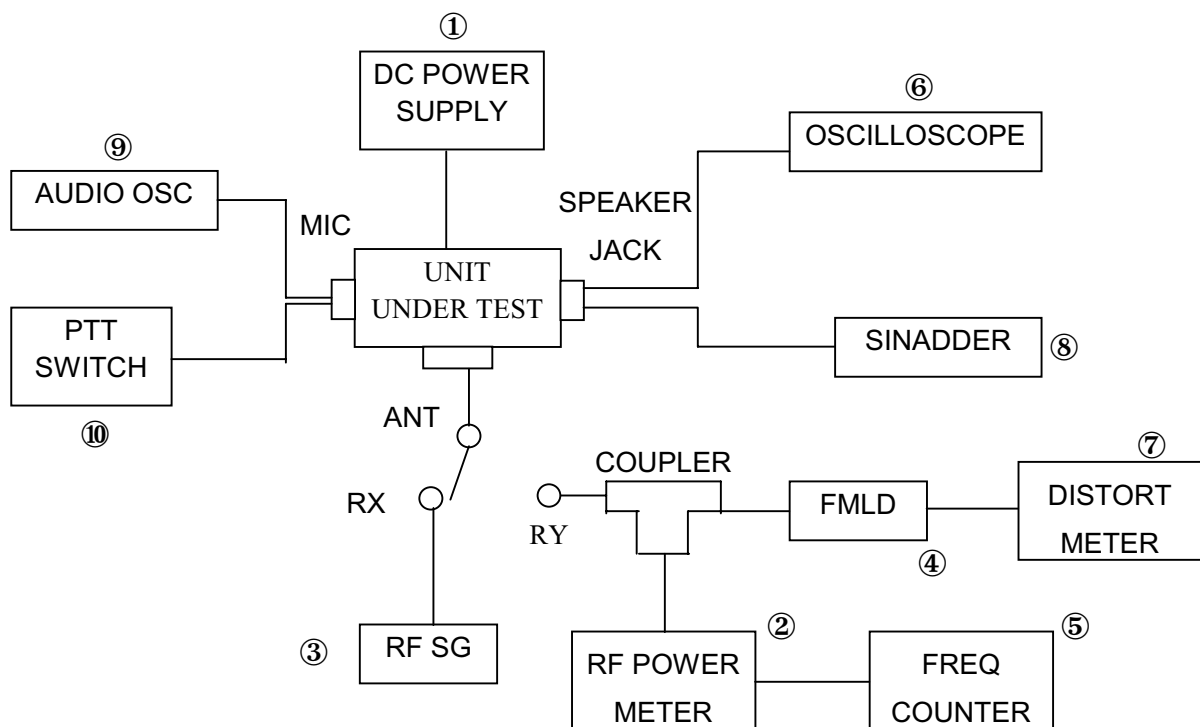
This transceiver is completely aligned at the factory and does not require any adjustments for installation. However it is considered as good practice to verify that none of the adjustments have changed.

The test equipment listed below are used for the test setup shown in Fig. 3.1.
This test setup used either partially or totally during the following adjustments.

A. TEST EQUIPMENT

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|---|---------------------------------|
| 1) DC Power Supply (7.2V DC) | 0 - 15V 3A max. |
| 2) RF Power Meter | 10 W 50 Ohm 100-200 MHz |
| 3) RF Signal Generator | 100-200 MHz, 50 ohm termination |
| 4) FM Linear Detector (FMLD) | 100-200 MHz |
| 5) Frequency Counter | 1-500 MHz |
| 6) Oscilloscope | 20 MHz |
| 7) Distortion Meter | |
| 8) SINADDER (Trademark of Helper Instruments Co.) | |
| 9) Audio Oscillator | |
| 10) Toggle Switch (for use as PTT switch). | |

Fig. 3.1



ADJUSTMENT PROCEDURE

Step	Adjustment	Test Point	Procedure
1	L22 Receive	TP1	<ol style="list-style-type: none"> 1. Connect digital voltmeter to TP1 on RF PCB. 2. Set CH01 USA. 3. Adjust L22. 4. TP1 voltage 1.3~1.7V DC.
2	L23 Transmit	TP1	<ol style="list-style-type: none"> 1. Connect a digital voltmeter to TP1 on RF PCB. 2. Set CH01 USA. 3. Adjust L23. 4. TP1 voltage 1.3~1.7V DC.
3	VC1		<ol style="list-style-type: none"> 1. Connect the antenna coupler output to a frequency counter. 2. Set channel to CH01 (156.050 MHz). 3. Adjust VC1 to obtain a frequency reading 156.050 MHz\pm200Hz.
4	VR3 Modulation		<ol style="list-style-type: none"> 1. Connect the antenna coupler output to an FM linear detector. 2. Connect Audio Oscillator to Microphone Jack. 3. Set unit to transmit mode. 4. Set audio oscillator output to -23dBm 1 kHz. 5. Adjust VR4 to obtain \pm4.5 kHz deviation.
5	VR6, VR1 RF power output		<ol style="list-style-type: none"> 1. Connect a RF power meter to antenna connector through antenna coupler. 2. Set unit to transmit mode. 3. Adjust VR6 to obtain: High power 4.5~5.5W. 4. Adjust VR1 to obtain: Low power 0.7~1.0W
6	T1		<ol style="list-style-type: none"> 1. Connect a VHF signal generator to the antenna connector. 2. Connect a SINADDER to speaker jack. 3. Set signal generator to output 1 kHz with \pm3 kHz deviation. 4. At frequency 156.050 MHz, adjust T1 to get maximum voltage and minimum distortion.

TROUBLE SHOOTING

Item	Symptom	Possible Cause
1	Unit does not turn on.	<ul style="list-style-type: none"> ● Defective power switch VR4. ● Check the battery voltage. ● Defective regulator IC7.
2	Speaker no sound with AF signal applied to volume control	<ul style="list-style-type: none"> ● Defective volume control. ● Defective speaker. ● Defective IC3 and/or associated components.
3	Squelch circuit inoperative	<ul style="list-style-type: none"> ● Check squelch control. ● Defective IC4 and/or associated circuitry between pin 9, 10 and 11.
4	No receive (RX)	<ul style="list-style-type: none"> ● Defective regular IC9. ● Check TP1 voltage 0.5 – 4V; ● Check second OSC 20.95MHz, pin1 of IC4; ● Defective Q21, Q23, D11, Q1. ● Check IC4 audio output voltage at pin 9. ● Defective audio signal buffer Q12. ● Defective F1 and F2;
5	Low receiver sensitivity	<ul style="list-style-type: none"> ● Check antenna and connector for possible corrosion or bad connection. ● Failure of the output from Q101, Q102, Q103, IC4 ● Check the output level of local OSC.
6	No transmit (TX)	<ul style="list-style-type: none"> ● Defective PTT switch. ● Defective regulator IC9. ● Check TP1 voltage 0.5 – 4V; ● Check power transmits circuit Q25, Q24, D3 and D1; ● Defective D11, Q4, Q2. ● Check power control circuit IC1, Q12, VR6, VR1, Q15 and D2;
7	Low RF power output	<ul style="list-style-type: none"> ● Check RF power output from Q24, If it checks good, then check and antenna switching diode D3, D1. ● If not good then check the voltage level outputs of the drive amplifiers Q2 and Q4 as well as the associated circuitry.
8	Poor or no modulation	<ul style="list-style-type: none"> ● Defective microphone. ● Defective IC8 and/or its associated components.
9	Deviation of transmit frequency	<ul style="list-style-type: none"> ● Check crystal X1 and VC1.