ALIGNMENT AND ADJUSTMENT

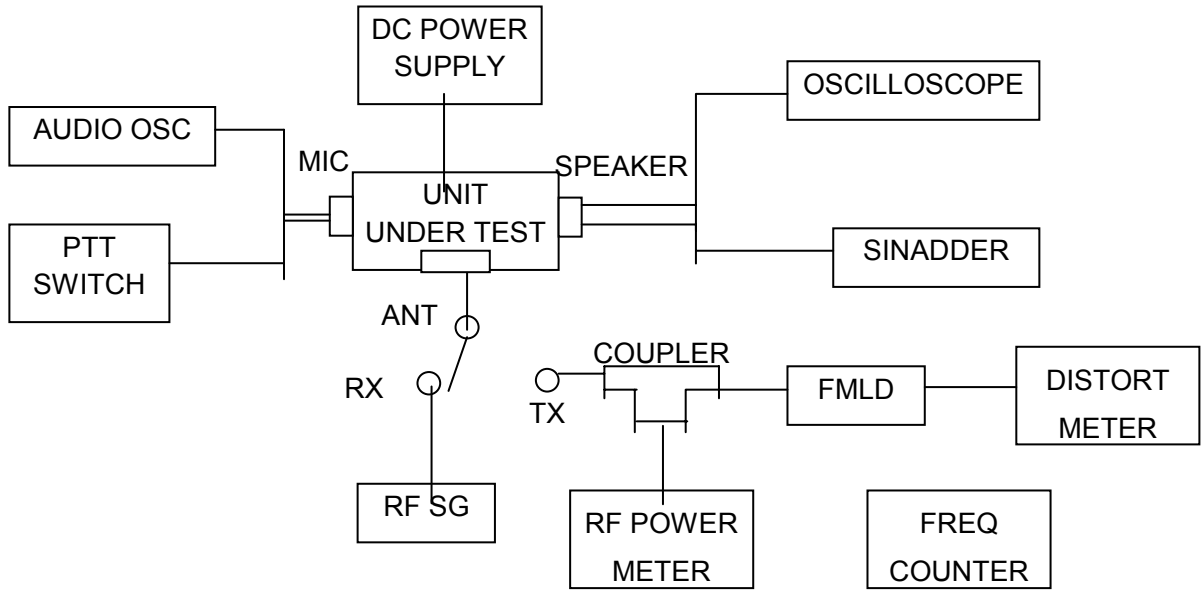
This transceiver is completely aligned at the factory and does not require any adjustments for installation. However it is considered as good practice to verify that none of the adjustments have changed.

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 adjustmentslibr.

A.TEST EQUIPMENT

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	L16 Receive	TP1	1. Connect digital voltmeter to TP1 on RF PCB. 2. Set CH16. 3. Adjust L16. 4. TP1 voltage 1.2~1.6V DC.
2	L17 Transmit	TP1	1. Connect a digital voltmeter to TP1 on RF PCB. 2. Set CH01 INT. 3. Adjust L17. 4. TP1 voltage 1.8~2.2V DC.
3	VC1		1. Connect the antenna coupler output to a frequency counter. 2. Set channel to CH16 (156.800 MHz). 3. Adjust VC1 to obtain a frequency reading 156.800 MHz ± 200 Hz.
4	VR3 Modulation		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 VR3 to obtain ±4.5 kHz deviation.
5	VR5, VR1 RF power output		1. Connect a RF power meter to antenna connector through antenna coupler. 2. Set unit to transmit mode. 3. Adjust VR5 to obtain: High power 4.5~5.5W. 4. Adjust VR1 to obtain: Low power 0.8~1.2W
6	T1		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 ± 3 kHz deviation. 4. At frequency 156.800 MHz, adjust T1 to get maximum voltage and minimum distortion.

TROUBLESHOOTING

Item	Symptom	Possible Cause
1	Unit does not turn on.	● Defective power switch VR6. ● Check the battery voltage. ● Defective regulator IC6.
2	Speaker no sound with AF signal applied to volume control	● Defective volume control. ● Defective speaker. ● Defective IC2 and/or associated components.
3	Squelch circuit inoperative	● Check squelch control. ● Defective IC3 and/or associated circuitry between pin 9, 10 and 11.
4	No receive (RX)	● Defective regulator IC6. ● Check TP1 voltage 0.5 – 3.5V. ● Check second OSC 20.95MHz, pin1 of IC3. ● Defective Q21, Q24, Q7. ● Check IC3 audio output voltage at pin 9. ● Defective audio signal buffer Q12. ● Defective F1 and F2.
5	Low receiver sensitivity	● Check antenna and connector for possible corrosion or bad connection. ● Failure of the output from Q5, Q18, Q1, IC3 ● Check the output level of local OSC.
6	No transmit (TX)	● Defective PTT switch. ● Defective regulator IC7. ● Check TP1 voltage 0.5 – 3.5V; ● Check power transmits circuit Q19, Q20, D2 and D1; ● Defective D11, Q4, Q2. ● Check power control circuit IC1, Q6, VR6, VR1, Q9 and D5;
7	Low RF power output	● Check RF power output from Q19, If it checks good, then check and antenna switching diode D2, 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	● Defective microphone. ● Defective IC7 and/or its associated components.
9	Deviation of transmit frequency	● Check crystal X1and VC1.