

5.0 REQUIRED TEST EQUIPMENT

- ① AC Power Supply (110V AC)
- ② RF Wattmeter
- ③ Multimeter
- ④ Automatic Modulation Meter
- ⑤ Audio Signal Generator
- ⑥ Frequency Counter (100 MHz)
- ⑦ RF Signal Generator (100 MHz)
- ⑧ Automatic Distortion Meter
- ⑨ Oscilloscope (50 MHz)
- ⑩ Sinad Meter

5.1 ALIGNMENT PROCEDURES

This transceiver has been aligned at the factory and does not require any adjustments at installation. The required test equipment listed are used for the test setup or alignment shown in Figure 5-1 Transmitter Test Setup and Figure 5-2 Receiver Test Setup. These test setups are used in part or total during the following adjustments and refer to Page 21 for adjustment location.


5.1.1 PLL ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
VCC Voltage	Set radio to Fr. Pool 12, CH 40 AM RX mode. Connect Multimeter to B+(EPT0SSB62A).	VR601 on Power PCB	13.8 VDC ± 0.1
VCO Voltage	Disconnect "short PCB" from TP7, TP8 & TP9. Set radio to Fr. Pool 12, CH 40 AM RX mode. Connect Multimeter to TP2.	L14	6.5 VDC ± 0.1
AM Frequency	Set radio to Fr. Pool 4, CH 1 AM RX mode. Set radio to Fr. Pool 10, CH 1 AM RX mode. Connect Frequency Counter to TP3.	L20 L17	14.9200 MHz ± 20Hz 17.6200 MHz ± 20Hz
USB Frequency	Set radio to Fr. Pool 4, CH 1 USB RX mode. Set radio to Fr. Pool 10, CH 1 USB RX mode. Connect Frequency Counter to TP3.	L21 L18	14.9225 MHz ± 20Hz 17.6225 MHz ± 20Hz
LSB Frequency	Set radio to Fr. Pool 4, CH 1 LSB RX mode. Set radio to Fr. Pool 10, CH 1 LSB RX mode. Connect Frequency Counter to TP3.	L22 L19	14.9175 MHz ± 20Hz 17.6175 MHz ± 20Hz
TX Frequency	Set radio to Fr. Pool 10, CH 1 AM TX mode. Set Coarse/Fine Control at 12 o'clock. Connect Frequency Counter to TP3.	VR7	17.6200 MHz ± 20Hz
AM OSC	Set radio to Fr. Pool 7, CH 1 AM TX mode. Connect Frequency Counter to TP5.	L23	10.6950 MHz ± 10 Hz
USB OSC	Set radio to Fr. Pool 7, CH 1 USB TX mode. Short the Collector & Emitter of Q34. Connect Frequency Counter to TP5.	L24	10.6925 MHz ± 10 Hz
LSB OSC	Set radio to Fr. Pool 7, CH 1 LSB TX mode. Short the Collector & Emitter of Q34. Connect Frequency Counter to TP5.	L25	10.6975 MHz ± 10 Hz

5.1.2 TRANSMITTER ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
TX Power	Set radio to Fr. Pool 7, CH 1 AM TX mode. Modulation off.	L40,L42, L43,L44	Maximum Output.
	Set radio to Fr. Pool 7, CH 1 USB TX mode. Set Mic Gain Control Fully Clockwise. Set RF PWR Control Fully Clockwise. Set Coarse/Fine Control at 12 o'clock. AF signal 30mV, 1 KHz to microphone. Connect Oscilloscope to Q51 (C). Set radio to 24.265 MHz and 29.655 MHz.	L43,L44	Maximum Output and Balance.
AM APC	Set radio to Fr. Pool 7, CH 1 AM TX mode. Connect Multimeter to TP7.	VR14	6 VDC
SSB APC	Set radio to Fr. Pool 7, CH 1 USB TX mode. Connect Multimeter to TP7.	VR17	12.5 VDC
BIAS Current	Set radio to Fr. Pool 7, CH 1 USB TX mode. Modulation off. Connect current meter to TP7(+) and TP9(-). Connect current meter to TP7(+) and TP8(-).	VR12 VR10 + VR11	100 mA (50 mA + 50 mA) = 100 mA
AM/FM TX Power	Set radio to Fr. Pool 7, CH 1 AM TX mode. Set RF PWR Control Fully Clockwise. Set RF PWR Control Fully Counter Clockwise. Modulation off. Connect "short PCB" to TP7, TP8 & TP9. Connect RF Power Meter to antenna jack.	VR14 VR18	10W 1W
RF Power Meter	Set radio to Fr. Pool 7, CH 1 AM TX mode. Set RF PWR Control Fully Clockwise.	VR9	For a needle reading of "10" on TX PWR scale.
AM Modulation	Set radio to Fr. Pool 7, CH 1 AM TX mode. Set Mic Gain Control Fully Clockwise. AF signal 30mV, 1 KHz to microphone.	VR16	90%
AM Modulation Meter	Set radio to Fr. Pool 7, CH 1 AM TX mode. Set Mic Gain Control Fully Clockwise. Set Calibrate Control Fully Counter Clockwise. AF signal 30mV, 1 KHz to microphone.	VR15	For a needle reading of "100%" on MOD scale.

TRANSMITTER ALIGNMENT (Continued)

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
FM Deviation	Set radio to Fr. Pool 7, CH 1 FM TX mode. Set Mic Gain Control Fully Clockwise. AF signal 30mV, 1 KHz to microphone.	VR5	4KHz
SSB ALC	Set radio to Fr. Pool 7, CH 1 USB TX mode. AF signal 30mV, 1 KHz to microphone.	VR13	25W
SSB Carrier Balance	Set radio to Fr. Pool 7, CH 1 USB TX mode. AF signal 30mV, 1 KHz to microphone. Connect Oscilloscope to antenna jack.	VR6	Spurious Emission to minimum.
CW TX	Set radio to Fr. Pool 7, CH 1 CW TX mode. Plug in CW Key. Disconnect the Mic Jack. Connect AC Voltmeter to EXT SP.	VR8	200mV (Sine Wave)
Frequency Counter Adjust	Set radio to Fr. Pool 7, CH 1 AM RX mode. Set DIM Control Fully Clockwise.	VC1 on Frequency Counter PCB	Display should be 

5.1.3 RECEIVER ALIGNMENT

ITEM	SETTINGS	ADJUST POINT	MEASUREMENT
AM Sensitivity	Set radio to Fr. Pool 7, CH 1 AM RX mode. Set Coarse/Fine Control at 12 o'clock. Set RF Gain Control Fully Clockwise. Set SQ Control Fully Counter Clockwise. Set NB-ANL/OFF switch to OFF position. Set VOL Control at 2 o'clock. Connect RF SG to antenna jack. Frequency 26.965 MHz, 1uV. Mod 30%. Set radio to Fr. Pool 1, CH 1 AM RX mode. RF SG setting 24.265 MHz. Set radio to Fr. Pool 12, CH 40 AM RX mode. RF SG setting 29.655 MHz.	L5,L6,L7, L8,L9,L10, L2,L3 L5,L6, L7	Audio Output > 2V S/N > 10 dB Balance between 24.265 and 29.655 MHz
FM Sensitivity	Set radio to Fr. Pool 7, CH 1 FM RX mode. RF SG setting 26.965 MHz, 0.5uV. Mod 3KHz.	L4	S/N > 20 dB
USB Sensitivity	Set radio to Fr. Pool 7, CH 1 USB RX mode. RF SG setting 26.966 MHz, 0.25uV. Mod off.	L11, L12	Audio Output > 2V S/N > 10 dB
LSB Sensitivity	Set radio to Fr. Pool 7, CH 1 LSB RX mode. RF SG setting 26.964 MHz, 0.25uV. Mod off.	L11, L12	Audio Output > 2V S/N > 10 dB
AM S-Meter	Set radio to Fr. Pool 7, CH 1 AM RX mode. RF SG setting 26.965 MHz, 100uV. Mod 30%.	VR1	For a reading of "9" on the "S" scale.
SSB S-Meter	Set radio to Fr. Pool 7, CH 1 USB RX mode. RF SG setting 26.966 MHz, 100uV. Mod off.	VR2	For a reading of "9" on the "S" scale.
AM Squelch	Set radio to Fr. Pool 7, CH 1 AM RX mode. Set SQ Control Fully Clockwise. RF SG setting 26.965 MHz, 1mV. Mod 30%.	VR4 Slowly	Adjust very slowly until squelch just open.
SSB Squelch	Set radio to Fr. Pool 7, CH 1 USB RX mode. Set SQ Control Fully Clockwise. RF SG setting 26.966 MHz, 1mV. Mod off.	VR3 Slowly	Adjust very slowly until squelch just open.
NB Adjust	Set radio to Fr. Pool 7, CH 1 AM RX mode. RF SG setting 26.965 MHz, 100uV. Mod off. Set NB-ANL/OFF switch to NB/ANL position. Connect Multimeter to TP1.	L1	DC Voltage to max. > 2V

5.1.4 WEATHER (WX) ALIGNMENT

ITEM	SETTINGS	ADJUST POINT	MEASUREMENT
Sensitivity	Set radio to WEATHER (WX) mode. Set VOL Control at 2 o'clock. Set SQ Control Fully Counter Clockwise. Connect RF SG to antenna jack. RF SG setting 162.000 MHz, 100uV. Mod 4KHz, 1000Hz.	L5	Maximum Output Minimum Distortion
	Set radio to WEATHER (WX) mode. RF SG setting 162.000 MHz, 100uV. Mod 4KHz, 1000Hz.	L4,L3	Reduce SG Level and Adjust for Maximum S/N reading.
	Set radio to WEATHER (WX) mode. RF SG setting 162.300 MHz, 1uV. Mod 4KHz. RF SG setting 162.600 MHz, 1uV. Mod 4KHz.	VR2	Automatic Lock Frequency.
Alert Frequency	Set radio to WEATHER (WX) mode. Connect Frequency Counter to IC1 (Pin5).	VR4	1050 Hz
Alert Sound	Set radio to WEATHER (WX) mode. RF SG setting 162.475 MHz, 1uV. Mod 4KHz, 1050Hz.	VR3	Adjust until Alert Sound is heard from U.U.T.