

ADJUSTMENT

1) Required Test Equipment

1. Digital Multimeter

2. Regulated Power Supply

Supply voltage: 13.8VDC
Current: 15A or more

3. Oscilloscope

Measurable frequency: Audio Frequency

4. Spectrum Analyzer

Measuring range: Up to 2GHz or more

5. Tracking Generator

Output frequency: Up to 2GHz or more

6. Dummy Load

Measurable frequency: Up to 500MHz
Impedance: 50Ω
Power: 50W or more

7. Speaker

Impedance: 8Ω

8. SSG

Output frequency: Up to 1GHz
Output level: -20dB/0.1μV to 120dB/1V
Modulation: AM/FM

9. Transceiver Tester

Up to 500MHz

a. Frequency Counter

b. Power Meter

Impedance: 50Ω
Measuring range: 50W or more

c. Audio Voltmeter

Measurable frequency: 50Hz ~ 10kHz
Sensitivity: 1mV ~ 10V

d. Distortion Meter

Measurable frequency: 1kHz
Input level: Up to 40dB
Distortion level: 1% ~ 100%

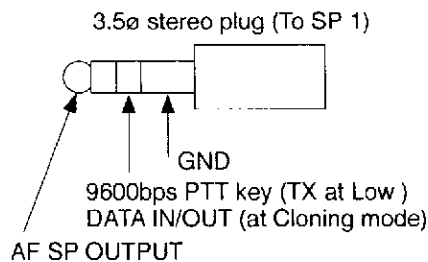
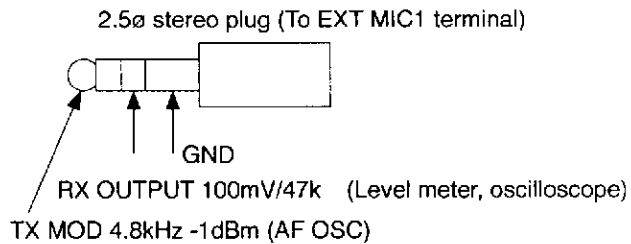
e. Audio Generator

Output frequency: 1kHz ~ 10kHz
Output impedance: 600Ω

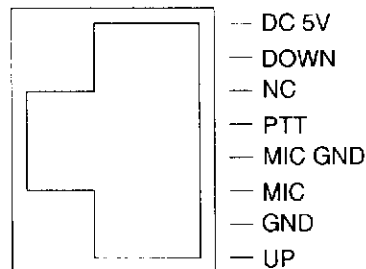
f. Linear Detector

10. 9600bps Hi-Speed Packet Testing

While holding the FUNC key down, press the VHF knob. "9600" is shown on the sub-band frequency display.



Mic terminal



Test Equipment

1. All SSG output is indicated by EMF.
2. AG output level connecting with the load is measured.
3. Standard Modulation: 1kHz \pm 3.5kHz/DEV
4. Audio Output level: 50mW~100mW at 8 Ω
5. Test Equipment level filter: HPF (30Hz~50Hz), LPF (10kHz~15kHz)
6. Coaxial cable: 5D2W 1m

Note:

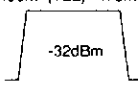
1. Power supply voltage is 13.8V.
Power switch is off.
2. Turn the volume knobs counterclockwise.
3. SQ volume (press VHF or UHF after pressing FUNC key) S0=squelch is open. S9=tight is closed.
4. Press and hold the "F" key, then turn the power switch on.
The display lights full.

2) UHF PLL Adjustment

Item	Condition	Measurement			Adjustment			Specifications
		Equipment	Unit	Terminal	Unit	Parts	Method	
Reference Frequency	f=435.00 TX	Freq. Counter Power Meter	Back	UHF ANT	VHF Main	TC1	435.0000MHz	\pm 100Hz
PLL VCO	f=440.00 RX(T, E)	Digital Multimeter	UHF Main	TP3	UHF VCO	L606	3.40V (Adjust)	3.4V \pm 0.2V
	f=410.00 RX(TE1)						2.50V (Adjust)	2.5V \pm 0.2V
	f=460.00 RX(TE2)						3.20V (Adjust)	3.2V \pm 0.2V
	f=440.00 TX(T, E)						5.50V (Check)	5.0V~6.0V
	f=410.00 TX(TE1)						4.50V (Check)	3.8V~5.2V
	f=460.00 TX(TE2)						5.30V (Check)	4.7V~6.0V

3) UHF RX Adjustment

(*): f=445.00 (T), f=435.00 (E), f=410.00 (TE1), f=460.00 (TE2)

Item	Condition	Measurement			Adjustment			Specifications
		Equipment	Unit	Terminal	Unit	Parts	Method	
Herical coil	f=435.00 (445.00)	T.G. -30dBm	Back	UHF ANT	UHF Main	TC201 TC202 L218 L219	Max Gain	430M (E) 440M 438M (T) 450M 400M (TE1) 420M 450M (TE2) 470M 
		Spectrum Analyzer	UHF	TP2				
Sensitivity	f=438.00 (T) f=440.00 (T) f=449.99 (T) f=430.00 (E) f=435.00 (E) f=439.99 (E) f=400.00 (TE1) f=410.00 (TE1) f=420.00 (TE1) f=450.00 (TE2) f=460.00 (TE2) f=470.00 (TE2) SSG OUT: -9.0dBμ	SSG Distortion Meter Oscilloscope Level Meter	Back	UHF SP1			Check	SINAD is 12dB or more.
S Meter	f=445.00 (*) SSG OUT: 18.0dBμ	SSG LCD UHF S Meter	Front panel		UHF Main	VR202	Starts lighting "Full."	
	SSG OFF						Check	
SQL level	f=445.00 (*) SSG OFF SQL LEVEL: 1	Digital Multimeter	Main	TP5	UHF Main	VR201	2.05V (Adjust)	2.05V±0.1V The squelch is closed.
Distortion	f=445.00 (*) SSG OUT: 60.0dBμ	SSG Distortion Meter Level Meter	Back	SP1			Check	4% or below
RX S/N	f=445.00 (*) SSG OUT: 60.0dBμ	SSG Level Meter Oscilloscope	Back	SP1			Check	40dB or more
9600bps Packet Out	f=445.00 (*) SSG OUT: 20.0dBμ f=4.8kHz 2.5kHz/DEV	SSG Level Meter Oscilloscope	Back	MIC1				100mV ±50mVrms /47kΩ

4) UHF TX Adjustment

(*): f=445.00 (T), f=435.00 (E), f=410.00 (TE1), f=460.00 (TE2)

Item	Condition	Measurement			Adjustment			Specifications
		Equipment	Unit	Terminal	Unit	Parts	Method	
High Power	f=445.00 (T) f=435.00 (E) f=410.00 (TE1) f=460.00 (TE2)	Power Meter Current Meter	Back	UHF ANT	UHF Main	VR203	Max	36W or more
	VR203					35W	±1.0W 11A or below	
Low Power	f=445.00 (*)					Check	5±2W	
DEV	f=445.00 (*) AG: 1kHz -30dBm	Linear Det. Oscilloscope Power Meter AG				VR204	4.5kHz /DEV	4.5kHz ±0.2kHz /DEV
MIC Gain	f=445.00 (*) AG: 1kHz -46dBm						VR205	Adjust
CTCSS Tone Level	f=445.00 (*) AG=0 TONE SW ENC 88.5Hz	Linear Det. Oscilloscope Power Meter					Check	0.5~1.3kHz /DEV
Tone Burst Level	f=445.00 (*) AG=0 PTT+DOWN key						Check	3.0kHz ±0.5kHz /DEV
9600bps Packet IN	f=445.00 (*) AG: 4.8kHz -1dBm FUNC+VHF key	Linear Det. Oscilloscope AG					Check	2.0kHz ±0.5kHz /DEV

5) VHF PLL Adjustment

Item	Condition	Measurement			Adjustment			Specifications
		Equipment	Unit	Terminal	Unit	Parts	Method	
Reference Frequency	f=145.00 TX	Freq. Counter Power Meter	Back	VHF ANT			Check	±100Hz
PLL VCO	f=145.00 RX(T, E) f=173.99 RX(TE1, 2)	Digital Multimeter	VHF Main	TP1	VHF VCO	L505	2.80V 7.35V	±0.3V ±0.05V
	f=145.00 RX(T, E) f=173.99 RX(TE1, 2)						Check	2.8V±1.0V 7.35V±0.4V

6) VHF RX Adjustment

Item	Condition	Measurement			Adjustment			Specifications
		Equipment	Unit	Terminal	Unit	Parts	Method	
Gain	f=145.00 (T,E) f=165.00 (TE1) f=165.00 (TE2)	SSG Distortion Meter Oscilloscope Level Meter	Back	VHF SP1	VHF Main	L14 L15 L16 L17	Adjust the SSG output level around 0dBμ, and turn L14~L17 to make the wave form max.	SINAD is 12dB or more.
Sensitivity	f=144.00 (T) f=147.99 (T) f=144.00 (E) f=145.99 (E) f=150.00 (TE1,2) f=162.00 (TE1,2) f=173.99 (TE1,2) SSG OUT: -9.0dBμ	SSG Distortion Meter Oscilloscope Level Meter	Back	VHF SP1	VHF Main	L14~ L17	Adjust the SINAD sensitivity and wave form to the best.	SINAD is 12dB or more.
	f=136.00 SSG OUT: 0dBμ						Check	SINAD is 12dB or more.
S Meter	f=145.00 (T,E) f=165.00 (TE1,2) SSG OUT: 18dBμ	SSG LCD VHF S Meter	Front Panel		VHF Main	VR1	Starts lighting "Full."	
	SSG OFF						Check	Does not light.
SQL level	f=145.00 (T,E) f=165.00 (TE1,2) SSG OFF SQL Level 1	Digital Multimeter	VHF Main	TP4	VHF Main	VR2	2.05V (Adjust)	2.05V±0.1V The squelch is closed.

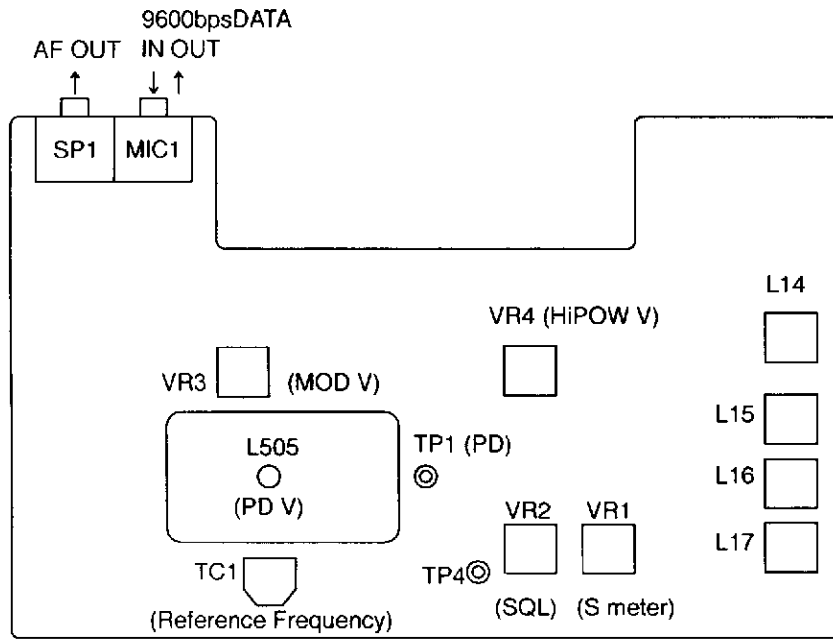
7) VHF TX Adjustment

(frequency) = TE1, TE2

Item	Condition	Measurement			Adjustment			Specifications				
		Equipment	Unit	Terminal	Unit	Parts	Method					
High Power	f=145.00 (165.00)	Power Meter Current Meter	Back	VHF ANT	VHF Main	VR4	Max	55W or more (T,E) 45W or more (TE1,TE2)				
	f=144.00 (150.00) f=145.99 (173.99)							±1.0W 11A or below				
	f=173.99 (136.00)						Check	48~55W 7A (T,E) 32~40W 11A (TE1,TE2)				
								Power is output.				
Low Power	f=145.00 (160.00)						Check	3~7W				
DEV	f=145.00 (160.00) AG: 1kHz -30dBm	Linear Det. Oscilloscope Power Meter	Back	VHF ANT	VHF Main	VR3	4.5kHz /DEV	4.5kHz ±0.2kHz /DEV				
MIC Gain	f=145.00 (160.00) AG: 1kHz -46dBm						Check	4.0 kHz ±0.3kHz /DEV				
CTCSS Tone Level	f=145.00 (160.00) AG=0 TONE SW ENC 88.5Hz							0.5~1.3kHz /DEV				
Tone Burst Level	f=145.00 (160.00) PTT+DOWN key							3.0kHz ±0.5kHz /DEV				
9600bps Packet IN	f=445.00 (*) AG: 4.8kHz -1dBm FUNC+VHF key						Check	2.0kHz ±0.5kHz /DEV				
X-BAND Repeater	f=145.00 f=445.00 (T) f=145.00 f=430.00 (E) f=160.00 f=410.00 (TE1) f=160.00 f=460.00 (TE2) XBR ON (VHF+PWR ON)										Check	3.5kHz ±0.5kHz /DEV

8) Adjustment Points

VHF Main Unit



UHF Main Unit

