

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, unbalanced
Power: 50W or more

7. Speaker (2 units)

Impedance: 8Ω

8. SSG

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

9. Transceiver Tester

500MHz or more

a. Frequency Counter

b. Power Meter

Impedance: 50Ω, unbalanced
Measuring range: 50W or more

c. Audio Voltmeter

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

d. Distortion Meter

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

e. Audio Generator

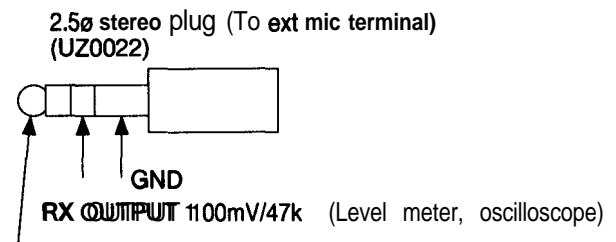
Output frequency: 1 kHz~10kHz
Output impedance: 600Ω, unbalanced

f. Linear Detector

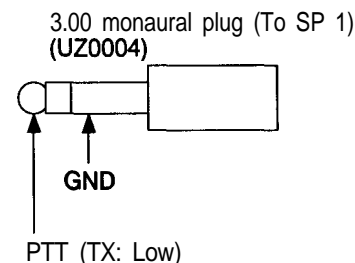
Filter: HPF (30Hz~50Hz)
LPF (1 0kHz~15kHz)

10. 9600bps Hi-Speed Packet Testing

While pushing the FUNC key, push RC key.
Make sure that "A" flashes on the UHF side.
Connect the plug to the SP1 jack on the rear of the unit.



TX MOD 4.8kHz -1 dBm (AF OSC)



Note 1

1. All SSG output is indicated by EMF.
2. AG output level connecting with the load is measured.
3. Standard Modulation: **1kHz +/- 3.5kHz/DEV**
4. Audio Output level: **50mW~100mW at 8Ω**
5. Coaxial cable: **5D2W 1 m**

Note 2

1. Power supply voltage is **13.8V**.
Power switch is off.
2. Turn the squelch and volume knobs counterclockwise.
3. Press and hold the "F" key, then turn the power switch on.

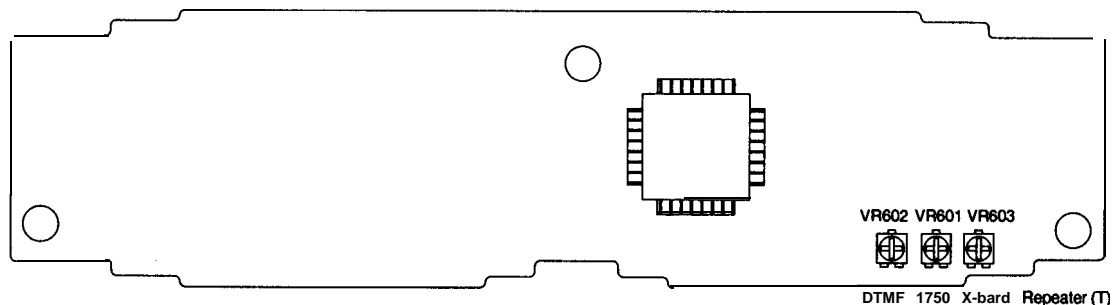
The display shows the frequency as follows:

145.00 433.00 (E version)

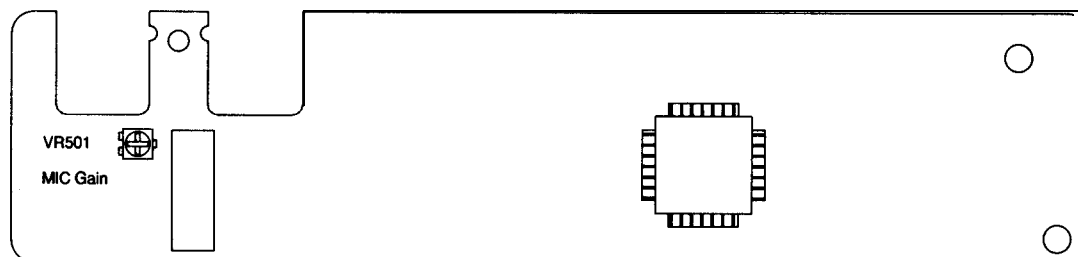
145.00 445.00 (T version)

2) Adjustment Points

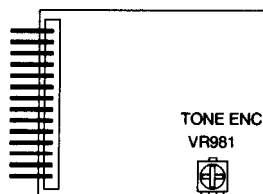
Sub Control Unit



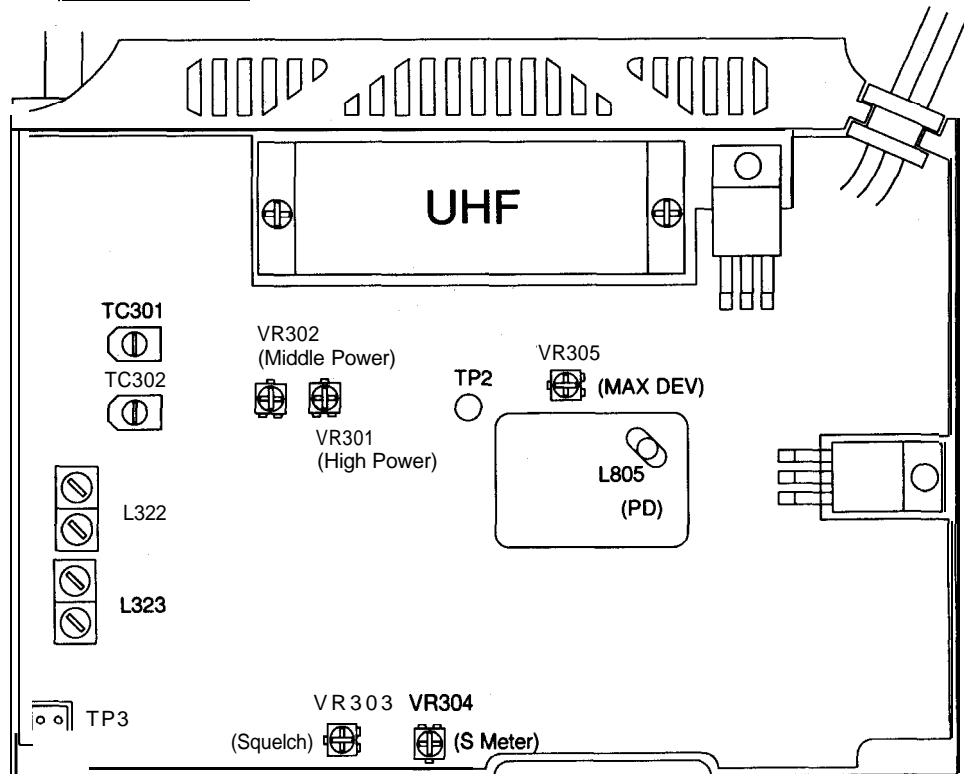
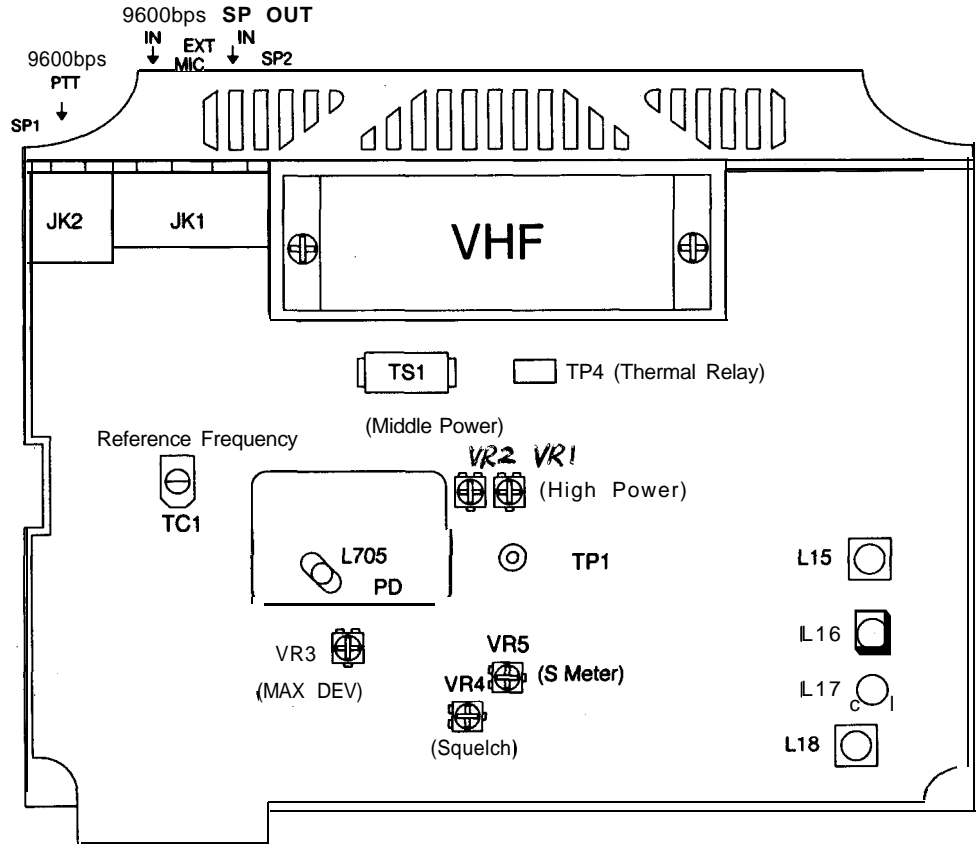
Front Control Unit



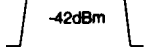
Tone ENC Unit



Main Unit



3) UHF RX Adjustment

item	Condition	Measurement				Adjustment			Specifications
		TX/RX	Equipment	Unit	Terminal	Unit	Parts	Method	
Reference Frequency	f=445.00MHz (T) f=435.00MHz (E)	TX	Freq. Counter Power Meter	Back	JHF ANT	VHF Main	TC1	445MHz (T) 435MHz (E)	+/- 100Hz
PLL VCO	f=440.00MHz	RX	Digital Multimeter	UHF Main	TP2	UHF v c o	L805	4.2V	4.2V+/-0.2V
	f=440.00MHz	TX					---	4.5V (Check)	4.0V~5.5V
	f=145.00MHz (SUB)	RX						3.8V (Check)	3.2V~4.8V
Herical coil	f=445.00MHz (T) f=435.00MHz (E)	RX	T.G. -40dBm	Back	JHF ANT	UHF Main	L322 L323	Max Gain	440M (T) 450M (T) 430M (E) 440M (E) 
			Spectrum Analyzer	UHF	TP3		TC301 TC302		
UHF Sensitivity	f=438.00MHz (T) f=445.02MHz (T) f=449.99MHz (T) SSG OUT: -9.0dBμ	RX	SSG Dist. Meter Oscilloscope	Back	JHF SP2			Check	SINAD is above 12dB
	f=430.00MHz (E) f=435.00MHz (E) f=439.99MHz (E) SSG OUT: -9.0dBμ								
VHF Sensitivity	f=138.00MHz (T) SSG OUT: -4.0dBμ	RX						Check	SINAD is above 12dB
	f=145.00MHz SSG OUT: -6.0dBμ								
	f=173.99MHz (T) SSG OUT: -4.0dBμ								
S Meter	f=445.00MHz (T) f=435.00MHz (E) SSG OUT: 18.0dBμ	R X	LCD UHF S Meter	Front panel		UHF Main	VR304	"Full" Flashing	
	SSG OFF							Check	Does not light.
SQL level	f=445.00MHz (T) f=435.00MHz (E) SSG OFF SQ VR: 9 o'clock	RX		Main		UHF Main	VR303	Turn VR303 to close the squelch	
								Turn the UHF SQ VR to make sure that the squelch closes at 9-1 0 o'clock.	
ATT	f=445.00MHz (T) f=435.00MHz (E)	RX		While pushing FUNC key, push H/L key. The ATT is lit. Make sure that the receiving sensitivity is attenuated about 10 ~ 20dB.					

4) UHF TX Adjustment

Item	Condition	TX/RX	Measurement			Adjustment			Specification:		
			Equipment	Unit	Terminal	Unit	Parts	Method			
High Power	f=445.05MHz (T) f=435.05MHz (E)	TX High	Power Meter Current Meter Voltage Meter	Back	UHF ANT	UHF Main	VR301	Max	Above 36W		
	36W							+/-1 .ow below 10A			
	Check							33-4ow 9A			
Middle Power	f=445.00MHz (T) f=435.00MHz (E)	T X Middle					VR302	10W	10+/-0.5W		
Low Power		TX Low						Check	5+/-1 w		
DEV	f=445.00MHz (T) f=435.00MHz (E) Mod: 1kHz Mic : -30dBm	TX	Linear Det. Oscilloscope Power Meter	Back	UHF ANT	UHF Main	VR305	4.7kHz /DEV	4.7kHz +/-0.2kHz /DEV		
MIC Gain	Mod: 1kHz Mic : -46dBm							Front	VR501	Check	4.0 kHz +/-0.3kHz /DEV
CTCSS Tone	f=445.00MHz (T) f=435.00MHz (E) Mod: OFF Tone SW ENC 88.5Hz							ENC	VR981	0.8kHz /DEV	0.8kHz +/-0.1 kHz /DEV
Tone Burst	f=439.00MHz Mod: OFF PTT+DOWN							SUB	VR601	Check	3.0kHz +/-0.3kHz /DEV
DTMF	f=439.00MHz CODE= "1111111111111111" Auto dialer ON									VR602	Check

5) VHF RX Adjustment

Item	Condition	TX/RX	Measurement			Adjustment			Specification
			Equipment	Unit	Terminal	Unit	Parts	Method	
Frequency	f=145.00MHz	TX	Freq. Counter Power Meter	Back	VHFANT			Check	+/- 100Hz
PLL VCO	f=145.00MHz	RX	Digital Multimeter	VHF Main	TP1	VHF vco	L705	3.00V	0.5V/-1v
	f=145.00MHz	TX						Check	3.0V+/-1.ov
	f=440.00MHz (SUB)	RX						Check	2.5V+/-0.8V
Note: When you set the voltage of VHF RX PD to 3.0V, turn the core of L705 clockwise. If the voltage can not be set to 3.0V, 2.0V is allowable.									
GAIN	f=145.00MHz	RX	Dist. Meter Oscilloscope	Back	VHF SP2	VHF Main	L15 ~ Lia	SINAD MAX	SINAD is above 12dB
Sensitivity	f=145.00MHz SSG OUT: -9.0dBμ		SSG Dist. Meter Oscilloscope				L15 Lia	SINAD MAX	SINAD is above 12dB
	f=138.00MHz (T) f=173.99MHz SSG OUT: -4.0dBμ							Check	SINAD is above 12dB
AM Sensitivity (T only)	f = 18.00MHz * SSG OUT: 5.0dBμ	RX					Check	S/N is above 10dB	
S Meter	f=145.00MHz SSG OUT: 20.0dBμ	RX	LCD VHF S Meter	Front panel	VHF Main	VR5	"Full" Flashing		
	SSG OFF						Check	Does not light.	
SQL level	f=145.00MHz SSG OFF SQ VR: 9 o'clock	RX		VHF Main	VHF Main	VR4	Turn VR4 to close the squelch		
				Turn the VHF SQ VR to make sure that the squelch closes at 9-10 o'clock.					
ATT	f=145.00MHz	RX		While pushing FUNC key, push H/L key. The ATT is lit. Make sure that the receiving sensitivity is attenuated about 10 ~ 20dB.					

6) VHF TX Adjustment

Item	Condition	Measurement				Adjustment			Specifications				
		TX/RX	Equipment	Unit	Terminal	Unit	Parts	Method					
High Power	f=145.00MHz	TX High	Power Meter Current Meter Voltage Meter	Back	VHF ANT	VHF Main	VR1	Max	Above 55W				
							VR1	52W	+/-1 .0w below 11A				
		Check					43-48W 11A						
Middle Power	f=144.00MHz (T) f=147.99MHz (T) f=144.00MHz (E) f=145.99MHz (E)	TX Middle					VR2	10W	10+/-1W				
Low Power			TX Low					Check	4~7W				
DEV	f=145.00MHz Mod: 1kHz Mic :-30dBm	TX	Linear Det. Oscilloscope Power Meter	Back	VHF ANT	VHF Main	VR3	4.7kHz /DEV	4.7kHz +/-0.2kHz /DEV				
MIC Gain	Mod: 1kHz Mic: -46dBm							Check	4.0 kHz +/-0.3kHz /DEV				
CTCSS Tone	f=145.00MHz Mod: OFF Tone SW ENC 88.5Hz							Check	0.8kHz +/-0.2kHz /DEV				
Tone Burst	f=145.00MHz Mod: OFF PTT+DOWN							Check	3.0kHz +/-0.4kHz /DEV				
DTMF	f=145.00MHz CODE= "1111111111111111" Auto dialer ON							Check	3.0kHz +/-0.4kHz /DEV				
X-BAND Repeater	f=145.00MHz RXf=445.00MHz (T) RXf=433.00MHz (E) X-BAND ON									SUB	VR603	Check	3.5kHz +/-0.5kHz /DEV
Thermal Relay	f=145.00MHz						TX High			TP4	VHF Main		Make sure that the power changes from "Hi" to "Low" when TP4 is connected to GND.