

ADJUSTMENT

1 Required Test Equipment

Table 7.1

Number	Name	Parameter requirements
1	Computer	Above P2, compatible IBM PC, WINDOWS 98/ME/2000/XPOperating System
2	Programming software	CU500 Programming software
3	Programming cable	Special Serial/USB (CPL-01) programming cable
4	Dubbing cable	CPL-02
5	DC regulator	Output voltage:7.5V, output electric current: $\geq 5A$
6	RF power meter	Test range: 0.5---10W Frequency range: 100MHz—500MHz Resistance: 50 Ω SWR ≤ 1.2
7	Frequency meter	Frequency range: 0.1—600MHz Frequency accuracy: higher than $\pm 1 \times 10^{-6}$ Sensitivity: higher than 100mV
8	Frequency deviator	Frequency range: DC—600MHz Test range: 0-- ± 5 kHz
9	DMM	Input resistance: above 10M Ω /V DC, capable of measuring voltage, electric current and resistance.
10	Audio signal generator	Frequency range:2---3000Hz Output level: 1---500mV
11	RF power attenuator	Decrement: 40db or 50db Receive power : higher than10W
12	Standard signal source	Frequency range:10MHz---1000MHz Output level:0.1 μ V~32mV (-127dBm~-17dBm)
13	Oscilloscope	Frequency range: DC~20MHz Test range: 10mV~20V
14	Audio Frequency voltmeter	Test range: 10mV~10V

Recommend how to use: item 6, 7, 8, 10, 11 and 12 which listed in the table can be substituted by integrated tester HP8920/HP8921.

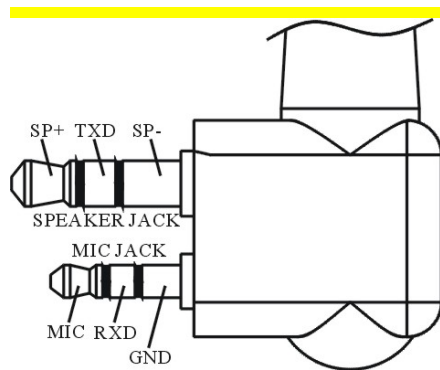


Figure 1 External Speaker/microphone Interface Definition

2 Adjustment Items

Some detection and adjustment shall be made to the station technical data after changing the components during the maintenance. The debugging introduction of some related circuits goes as follows:

Some parameters of the product can be adjusted by use of CU500 Programming Software of our company. The adjustable parameters are as follows:

- (1) Frequency stability
- (2) RF transmitting high power
- (3) RF transmitting Middle power
- (4) RF transmitting Low power
- (5) Maximum TX voice deviation
- (6) VOX1(Tight)
- (7) VOX10
- (8) 2/5 tone deviation
- (9) DTMF deviation
- (10) MSK deviation
- (11) DCS/LTR balance
- (12) DCS deviation
- (13) LSD deviation
- (14) CTCSS(67.0Hz) deviation
- (15) CTCSS(254.1Hz) deviation
- (16) Battery warning level
- (17) RX Sensitivity
- (18) DCS RX middle level
- (19) RX squelch 9 open level
- (20) RX squelch 9 close level
- (21) RX squelch 1 open level
- (22) RX squelch 1 close level
- (23) RSSI(-120dBm)
- (24) RSSI(-70dBm)

Steps for adjustment:

- 1) Enter Computer Test Mode by selecting “Test Mode” in main menu of CU500 Programming Software.
- 2) Select the items to be adjusted in choice menus, and then adjust the parameters by function keys on the computer keyboard.
- 3) Exit Computer Test Mode after adjustment.

3 Adjustment**3.1 VCO Adjustment**

Close “Power-saving Mode”. Set receiving frequency to low frequency point (see Table 7.2) and in the receiving state, test voltage of PD by DMM and adjust fine-tuning capacitor TC1/TC2 to get CV voltage of $1.0V \pm 0.2V$

Set transmitting frequency to high frequency point (refer to Table 2), press PTT and test voltage of PD by DMM, which shall less than 4.0V

Table 2 High/ Intermediate/ Low Frequency Point of All Models

	Low Frequency Point	Intermediate Frequency Point	High Frequency Point
CU500-2 CU510-2	400.100 MHz	435.100 MHz	469.975 MHz

3.2 Frequency stability

Double-click to enter “Frequency Stability” in “Test Mode Manual” to achieve the rated transmitting frequency by adjusting the number from 0 to 255 (Error<100Hz).

3.3 RF transmitting power**High power**

Adjusts the transmitting power to 4.0-5.0W in the computer (5 frequency points including Highest, High, Med, Low, lowest)

Middle Power

Adjust the transmitting power to 2.0-2.5W in the computer

Low Power

Adjust the transmitting power to 0.4-0.6W in the computer

3.4 Voice deviation

Maximum voice deviation

Signal source: MOD:1kHz/120mV LPF:15kHz

Adjust the max frequency deviation in the computer adjustment mode.

3.9kHz---4.5kHz (wideband)

3.2kHz---3.9kHz (median band)

between 1.8kHz---2.3kHz (narrowband)

(2/5)TONE, DTMF, MSK Deviation

Adjust TONE, DTMF, MSK deviation in the computer adjustment mode.

3.2---4.0 kHz (wideband)

3.0kHz---3.6kHz (median band)

1.8---2.3kHz (narrowband)

VOX1, VOX10

Adjust VOX1, VOX10 microphone sensitivity in the computer adjustment mode.

VOX1 for 50mv and VOX10 for 5 mv

3.5 CTCSS/DCS deviation

DCS/LTR balance

Signal source: LPF: 300Hz

Adjust DCS/LTR balance in the computer adjustment mode.

Make the transmitting demodulation waveform be flat square wave.

DCS deviation

Signal source: LPF: 300Hz

Adjust DCS frequency deviation in the computer adjustment mode.

0.50kHz---0.85kHz (wideband)

0.50kHz ---0.65kHz (medium band)

0.25kHz--0.45kHz (narrowband)

The waveform shall be good.

LSD deviation

Reserved for the future.

CTCSS(67.0, 254.1Hz) deviation

Signal source: LPF:300Hz

Adjust CTCSS deviation in the computer adjustment mode.

0.50kHz---0.85kHz (wideband)

0.50kHz ---0.65kHz (medium band)

0.25kHz--0.45kHz (narrowband)

The waveform shall be good.

3.6 Battery warning level

Adjust the battery warning level in the computer adjustment mode.
Set the power supply voltage at 6.8V, and press start and then end.

3.7 Receive sensitivity

Adjust the sensitivity in the computer adjustment mode.
Make the sensitivity of all frequency points the highest
(provided the sensitivity is the highest, the better data)

3.8 Squelch adjustment

Adjust squelch in the computer adjustment mode.

Squelch 9 open

The signal level output is set to -118dBm (wideband) or -117dBm
(narrowband)

Automatically records the corresponding squelch level.

Squelch 9 close

The signal level output is set to -120dBm(wideband) or -119dBm (narrowband)

Automatically records the corresponding squelch level.

Squelch 1 open

The signal level output is set to -124dBm (wideband) or -123dBm
(narrowband)

Automatically records the corresponding squelch level

Squelch 1 close

The signal level output is set to -126dBm (wideband) or -125dBm
(narrowband)

Automatically records the corresponding squelch level

3.9 RSSI adjustment

RSSI(-120dBm), RSSI(-70dBm)

The signal level output is set to -120dBm or -70dBm.

Automatically records the corresponding RSSI level.

Note: Voltage for the aforesaid tests: 7.4V +/-0.1V in room temperature