

ADJUSTMENT

1 Required Test Equipment

Table 7.1

| Number | Name | Parameter requirements |
|--------|---------------------------|---|
| 1 | Computer | Above P2, compatible IBM PC, WINDOWS 98/ME/2000/XP Operating 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:7.4V, 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 than 10W |
| 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.

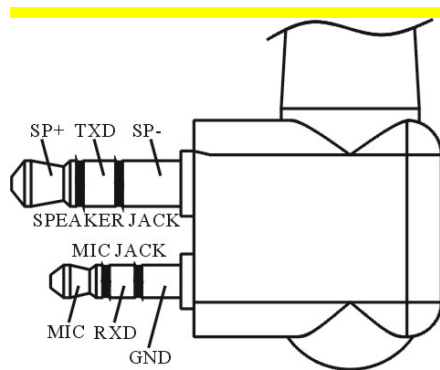


Figure 1 External Speaker/microphone Interface Definition

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 |
|--------------------|---------------------|------------------------------|----------------------|
| CU500-1 CU510-1 | 136.000 MHz | 155.100 MHz | 173.975 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 4.8-5.2W in the computer (5 frequency points including Highest, High, Med, Low, lowest)

Middle Power

Adjust the transmitting power to 1.8-2.2W in the computer

Low Power

Adjust the transmitting power to 0.8-1.2W 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.

between 1.8kHz---2.3kHz (narrowband)

(2/5)TONE, DTMF, MSK Deviation

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

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.

0.25kHz--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.

0.25kHz--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

-117dBm
(narrowband)

Automatically records the corresponding squelch level.

Squelch 9 close

-119dBm (narrowband)

Automatically records the corresponding squelch level.

Squelch 1 open

-123dBm
(narrowband)

Automatically records the corresponding squelch level

Squelch 1 close

-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: 7.5V +/-0.1V in room temperature