

# IC-V8/T3H SOFTWARE ADJUSTMENT PROCEDURES

## 1 PREPARATION

When adjusting the contents on page 5 or 6, SOFTWARE ADJUSTMENT, a CS-V8 ADJ ADJUSTMENT SOFTWARE (Rev. 1.0 or later), OPC-478 OPTIONAL CLONING CABLE, CS-V8 OPTIONAL CLONING SOFTWARE (Rev. 1.0 or later) and a JIG CABLE are required.

### ■ REQUIRED TEST EQUIPMENT

| EQUIPMENT                           | GRADE AND RANGE                                                                                          | EQUIPMENT                       | GRADE AND RANGE                                                                   |
|-------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------|
| DC power supply                     | Output voltage : 7.2 V DC<br>Current capacity : 5 A or more                                              | Audio generator                 | Frequency range : 300–3000 Hz<br>Output level : 1–500 mV                          |
| RF power meter<br>(terminated type) | Measuring range : 1–10 W<br>Frequency range : 120–500 MHz<br>Impedance : 50 Ω<br>SWR : Less than 1.2 : 1 | Attenuator                      | Power attenuation : 40 or 50 dB<br>Capacity : 10 W or more                        |
| Frequency counter                   | Frequency range : 0.1–500 MHz<br>Frequency accuracy : ±1 ppm or better<br>Sensitivity : 100 mV or better | Standard signal generator (SSG) | Frequency range : 120–500 MHz<br>Output level : 0.1 μV–32 mV<br>(–127 to –17 dBm) |
| FM deviation meter                  | Frequency range : DC–500 MHz<br>Measuring range : 0 to ±5 kHz                                            | DC voltmeter                    | Input impedance : 50 kΩ/V DC or better                                            |
| Digital multimeter                  | Input impedance : 10 MΩ/V DC or better                                                                   | Oscilloscope                    | Frequency range : DC–20 MHz<br>Measuring range : 0.01–20 V                        |
|                                     |                                                                                                          | AC millivoltmeter               | Measuring range : 10 mV–10 V                                                      |

### ■ SYSTEM REQUIREMENTS

- IBM PC compatible computer with an RS -232C serial port (38400 bps or faster).
- Microsoft Windows 95 or Windows 98
- Intel i486DX processor or faster (Pentium 100 MHz or faster recommended)
- At least 16 MB RAM and 10 MB of hard disk space
- 640×480 pixel display (800×600 pixel display recommended)

### ■ ADJUSTMENT SOFTWARE INSTALLATION

- ① Boot up Windows.  
- Quit all applications when Windows is running.
- ② Select 'Run' from the [Start] menu.
- ③ Type the setup program name using the full path name, then push the [Enter] key. (For example; D:\ setup)
- ④ Follow the prompts.
- ⑤ Program group 'CS-V8 ADJ' appears in the 'Programs' folder of the [Start] menu.

### ■ STARTING SOFTWARE ADJUSTMENT

- ① Connect IC-V8/T3H and PC with the optional OPC-478 and the JIG cable.
- ② Boot up Windows, and turn the transceiver power ON.
- ③ Click the program group 'CS-V8 ADJ' in the 'Programs' folder of the [Start] menu, then CS-V8 ADJ's window is appeared.
- ④ Click 'Connect' on the CS-V8 ADJ's window, then appears IC-V8/T3H's up-to-date condition.
- ⑤ Set or modify adjustment data as desired.

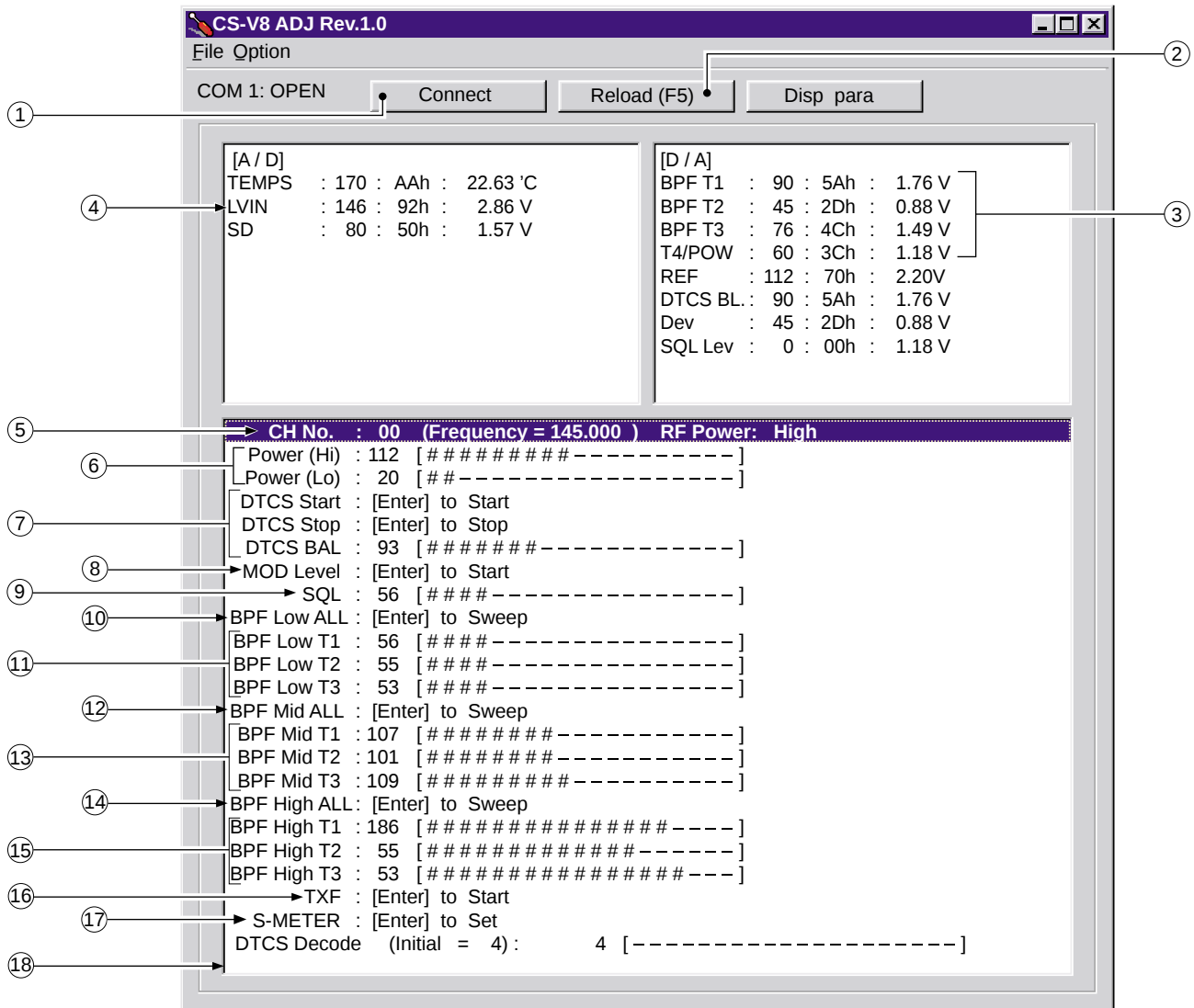
**WARNING:** After finished adjustments, IC-V8/T3H must be operated as follow operation. Otherwise, the transceiver does not work properly.

- ①: Turn power OFF.
- ②: Push and hold the [D] and MONI keys, and then turn power ON.

**CAUTION:** All memory data will be cleared at above operation. Thus, back up the original memory data using the cloning software CS-V8 and OPC-478, and re-program it after adjustment.

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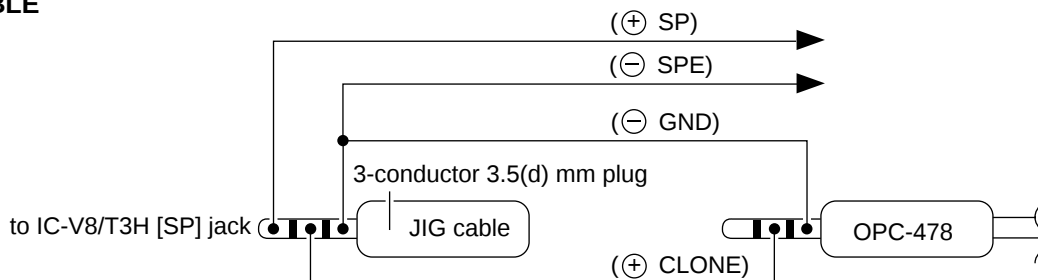
## • SCREEN DISPLAY EXAMPLE



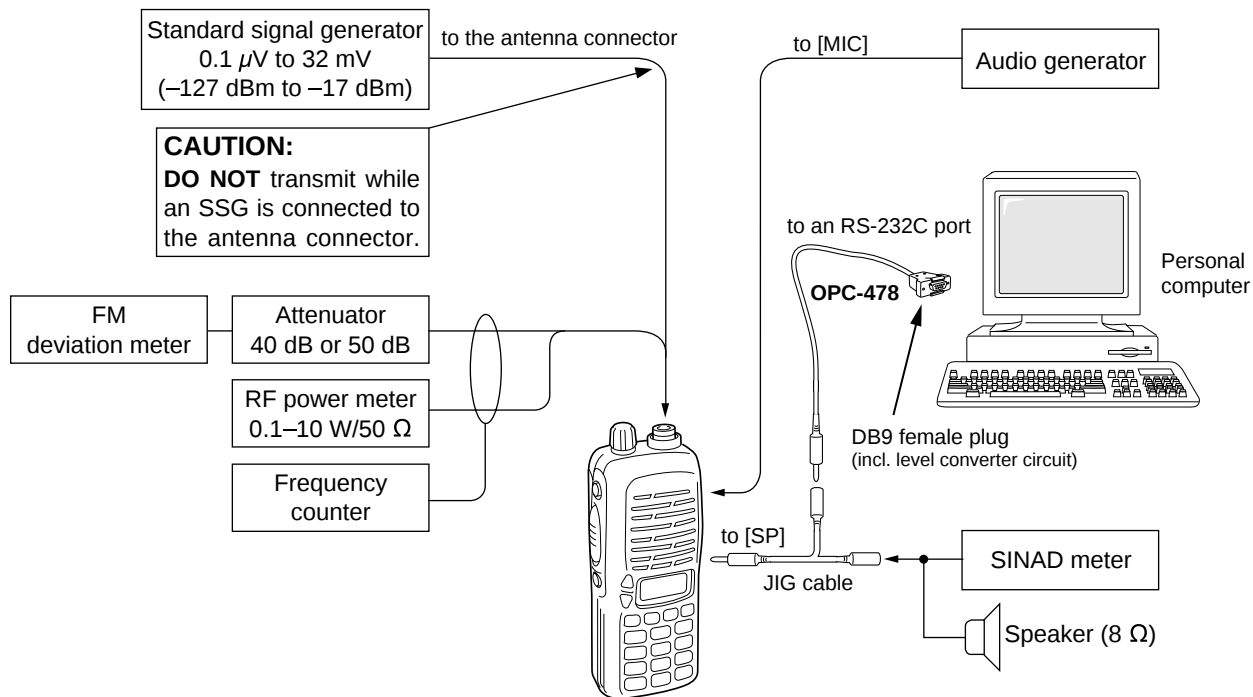
**NOTE:** The above values for settings are example only.  
Each transceiver has its own specific values for each setting.

- |                                     |                                                |
|-------------------------------------|------------------------------------------------|
| ① : Transceiver's connection state  | ⑩ : Receive sensitivity [Low] (automatically)  |
| ② : Reload adjustment data          | ⑪ : Receive sensitivity [Low] (manually)       |
| ③ : Receive sensitivity measurement | ⑫ : Receive sensitivity [Mid] (automatically)  |
| ④ : PLL lock voltage                | ⑬ : Receive sensitivity [Mid] (manually)       |
| ⑤ : Operating channel select        | ⑭ : Receive sensitivity [High] (automatically) |
| ⑥ : RF output power                 | ⑮ : Receive sensitivity [High] (manually)      |
| ⑦ : DTCS wave balance               | ⑯ : Reference frequency                        |
| ⑧ : FM deviation                    | ⑰ : S-Meter                                    |
| ⑨ : Squelch level                   | ⑱ : Adjustment items                           |

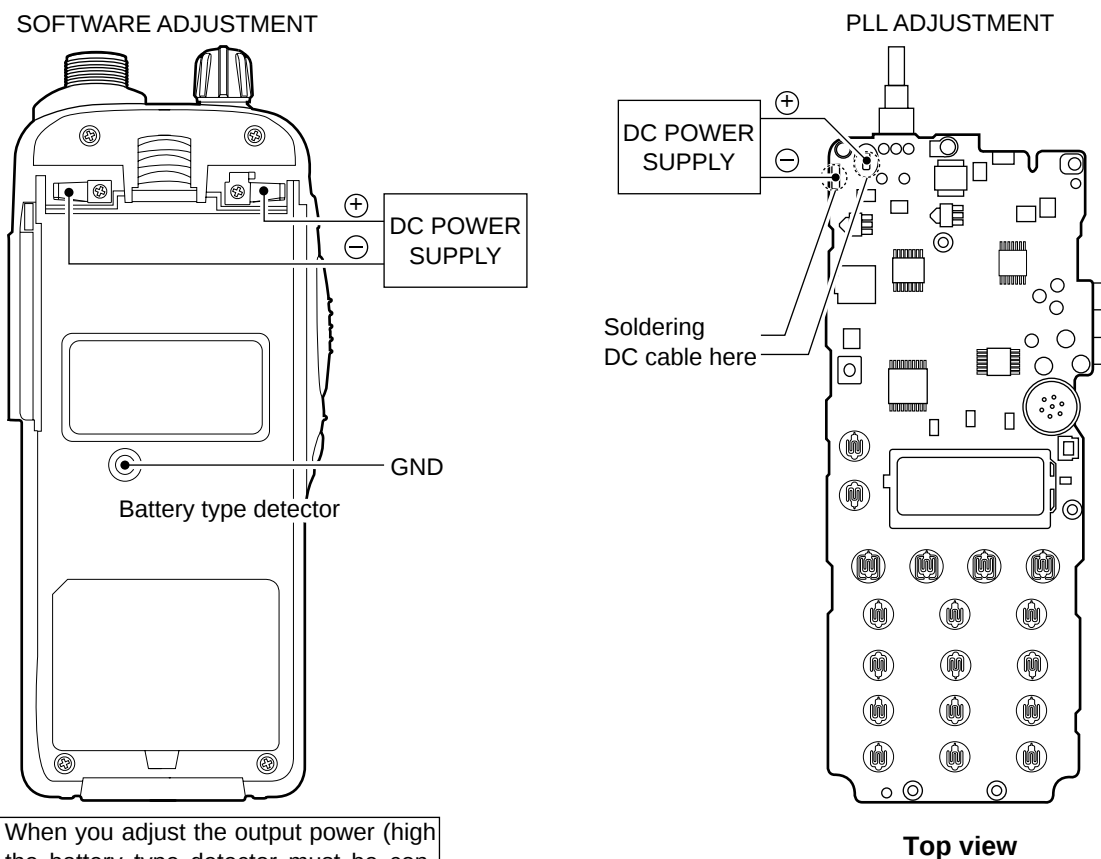
## • JIG CABLE



## • CONNECTION



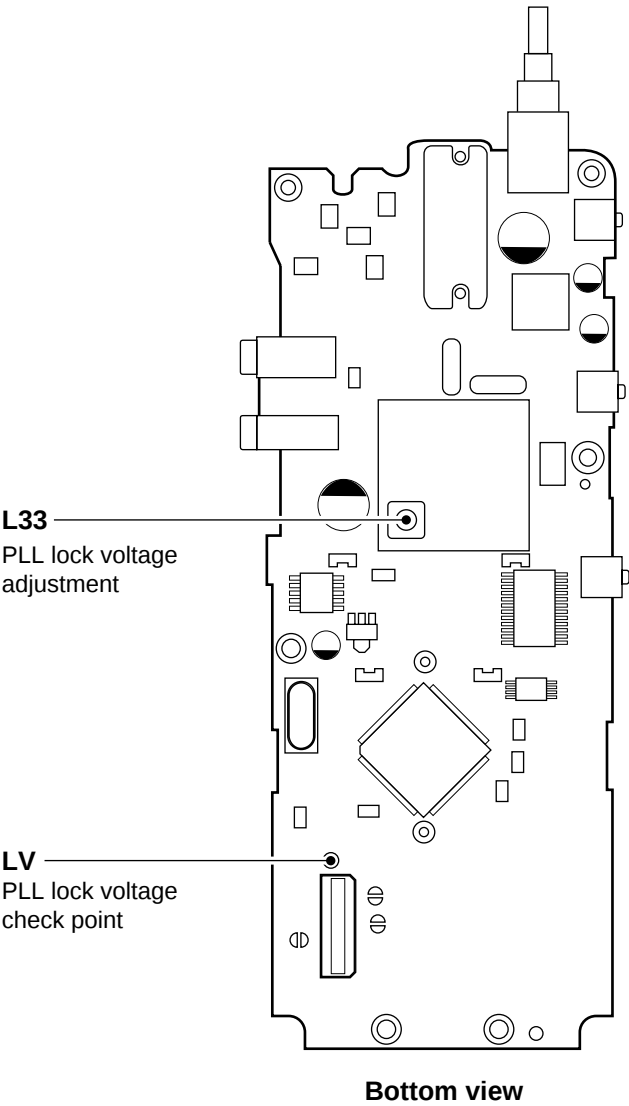
## • DC POWER CABLE CONNECTIONS



**NOTE:** When you adjust the output power (high power), the battery type detector must be connected to GND (see illustration at above). Otherwise the transceiver does not transmit high power, the output power will be low.

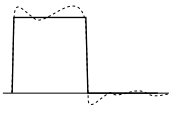
2 PLL ADJUSTMENT

| ADJUSTMENT       |   | ADJUSTMENT CONDITIONS                                                 | MEASUREMENT |                                                  | VALUE | ADJUSTMENT |        |
|------------------|---|-----------------------------------------------------------------------|-------------|--------------------------------------------------|-------|------------|--------|
|                  |   |                                                                       | UNIT        | LOCATION                                         |       | UNIT       | ADJUST |
| PLL LOCK VOLTAGE | 1 | <div>• Operating frequency : 145.000 MHz</div> <div>• Receiving</div> | MAIN        | Connect a digital multi meter to check point LV. | 2.7 V | MAIN       | L33    |



### 3 SOFTWARE ADJUSTMENT

Select an operation using [↑] / [↓] keys, then set specified value using [←] / [→] keys on the connected computer keyboard.

| ADJUSTMENT                                                                                |   | ADJUSTMENT CONDITION                                                                                                                                                                                                                                                                                                                                  | MEASUREMENT |                                                                                                    | VALUE                                                                                                          |
|-------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|                                                                                           |   |                                                                                                                                                                                                                                                                                                                                                       | UNIT        | LOCATION                                                                                           |                                                                                                                |
| REFERENCE FREQUENCY [TXF]                                                                 | 1 | <ul style="list-style-type: none"> <li>Operating frequency : 145.000 MHz</li> <li>High/Low switch : Low</li> <li>Connect the RF power meter or 50 Ω dummy load to the antenna connector.</li> <li>Transmitting</li> </ul>                                                                                                                             | Top panel   | Loosely couple a frequency counter to the antenna connector.                                       | 145.00000 MHz                                                                                                  |
| OUTPUT POWER [POWER(HI)]                                                                  | 1 | <ul style="list-style-type: none"> <li>Operating frequency : 146.000 MHz</li> <li>High/Low switch : High</li> <li>Transmitting</li> </ul>                                                                                                                                                                                                             | Top panel   | Connect an RF power meter to the antenna connector.                                                | 5.5 W                                                                                                          |
| <b>NOTE:</b> Low power is adjusted automatically when High power' adjustment is finished. |   |                                                                                                                                                                                                                                                                                                                                                       |             |                                                                                                    |                                                                                                                |
| FM DEVIATION [MOD]                                                                        | 1 | <ul style="list-style-type: none"> <li>Operating frequency : 146.000 MHz</li> <li>High/Low switch : Low</li> <li>Connect the audio generator to the [MIC] jack and set as:<br/>1.0 kHz/150 mVrms</li> <li>Set the FM deviation meter as:<br/>HPF : OFF<br/>LPF : 20 kHz<br/>De-emphasis : OFF<br/>Detector : (P-P)/2</li> <li>Transmitting</li> </ul> | Top panel   | Connect an FM deviation meter to the antenna connector through the attenuator.                     | ±4.2 kHz                                                                                                       |
| DTCS WAVE FORM [DTCS BAL]                                                                 | 1 | <ul style="list-style-type: none"> <li>Operating frequency : 146.000 MHz</li> <li>High/Low switch : Low</li> <li>No audio applied to the [MIC] jack.</li> <li>DTCS code : 007</li> <li>Transmitting</li> </ul>                                                                                                                                        | Top panel   | Connect an FM deviation meter with an oscilloscope to the antenna connector through an attenuator. | Set to flat wave form<br> |

### SOFTWARE ADJUSTMENT – continued

Select an operation using  $\uparrow$  /  $\downarrow$  keys, then set specified value using  $\leftarrow$  /  $\rightarrow$  keys on the connected computer keyboard.

| ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                            | ADJUSTMENT CONDITION                                                                                                                                                                                                                                                 | MEASUREMENT                                     |                                                         | VALUE                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|----------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                      | UNIT                                            | LOCATION                                                |                                                    |
| RX SENSITIVITY<br>[BPF T1] – [BPF T3]<br>(BPF Low)                                                                                                                                                                                                                                                                                                                                                    | 1 • Operating frequency:<br>136.000 MHz<br>• Connect a standard signal generator to the antenna connector and set as:<br>Frequency : 136.000 MHz<br>Level : 1 μV* (–107 dBm)<br>Modulation : 1 kHz<br>Deviation : ±3.5 kHz<br>• Receiving                            | Top panel                                       | Connect a SINAD meter with an 8Ω load to the [SP] jack. | Minimum distortion level                           |
| (BPF Mid)                                                                                                                                                                                                                                                                                                                                                                                             | 2 • Operating frequency :<br>150.000 MHz<br>• Set the SSG's frequency as:<br>150.000 MHz<br>• Receiving                                                                                                                                                              |                                                 |                                                         | Minimum distortion level                           |
| (BPF High)                                                                                                                                                                                                                                                                                                                                                                                            | 3 • Operating frequency:<br>174.000 MHz<br>• Set the SSG's frequency as:<br>174.000 MHz<br>• Receiving                                                                                                                                                               |                                                 |                                                         | Minimum distortion level                           |
| <b>CONVENIENT:</b> The BPF T1–BPF T3 can be adjusted automatically.<br>①-1: Set the cursor to “BPF ALL” on the adjustment program and then push [ENTER] key.<br>①-2: The connected PC tunes BPF T1–BPF T3 to peak levels.<br>or<br>②-1: Set the cursor to one of BPF T1, T2, or T3 as desired.<br>②-2: Push [ENTER] key to start tuning.<br>②-3: Repeat ②-1 and ②-2 to perform additional BPF tuning. |                                                                                                                                                                                                                                                                      |                                                 |                                                         |                                                    |
| SQUELCH LEVEL<br>[SQL]                                                                                                                                                                                                                                                                                                                                                                                | 1 • Operating frequency :<br>146.000 MHz<br>• Squelch level : 1<br>• Connect a standard signal generator to the antenna connector and set as:<br>Frequency : 146.000 MHz<br>Level : 0.11 μV* (–126 dBm)<br>Modulation : 1 kHz<br>Deviation : ±3.5 kHz<br>• Receiving | Top panel                                       | Connect a SINAD meter with an 8Ω load to the [SP] jack. | 12 dB SINAD                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                       | 2 • Receiving                                                                                                                                                                                                                                                        |                                                 |                                                         | At the point where the audio signals just appears. |
| S-METER<br>[S-METER]                                                                                                                                                                                                                                                                                                                                                                                  | 1 • Operating frequency:<br>146.000 MHz<br>• Connect a standard signal generator to the antenna connector and set as:<br>Frequency : 146.000 MHz<br>Level : 0.4 μV* (–115 dBm)<br>Modulation : 1 kHz<br>Deviation : ±3.5 kHz<br>• Receiving                          | S-METER is adjusted automatically by CS-V8 ADJ. |                                                         |                                                    |

\*The output level of the standard signal generator (SSG) is indicated as the SSG's open circuit.