

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

When you adjust the contents on page 5-5 or 5-6, SOFTWARE ADJUSTMENT, the optional CS-F3G ADJ ADJUSTMENT SOFTWARE (Rev. 1.0 or later), OPC-478 CLONING CABLE and a JIG CABLE (see illustration at page 5-2) are required.

REQUIRED TEST EQUIPMENT

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

NOTE: Before using the program, make a backup copy of the original disk. After making a backup copy, keep the original disk in a safe place.

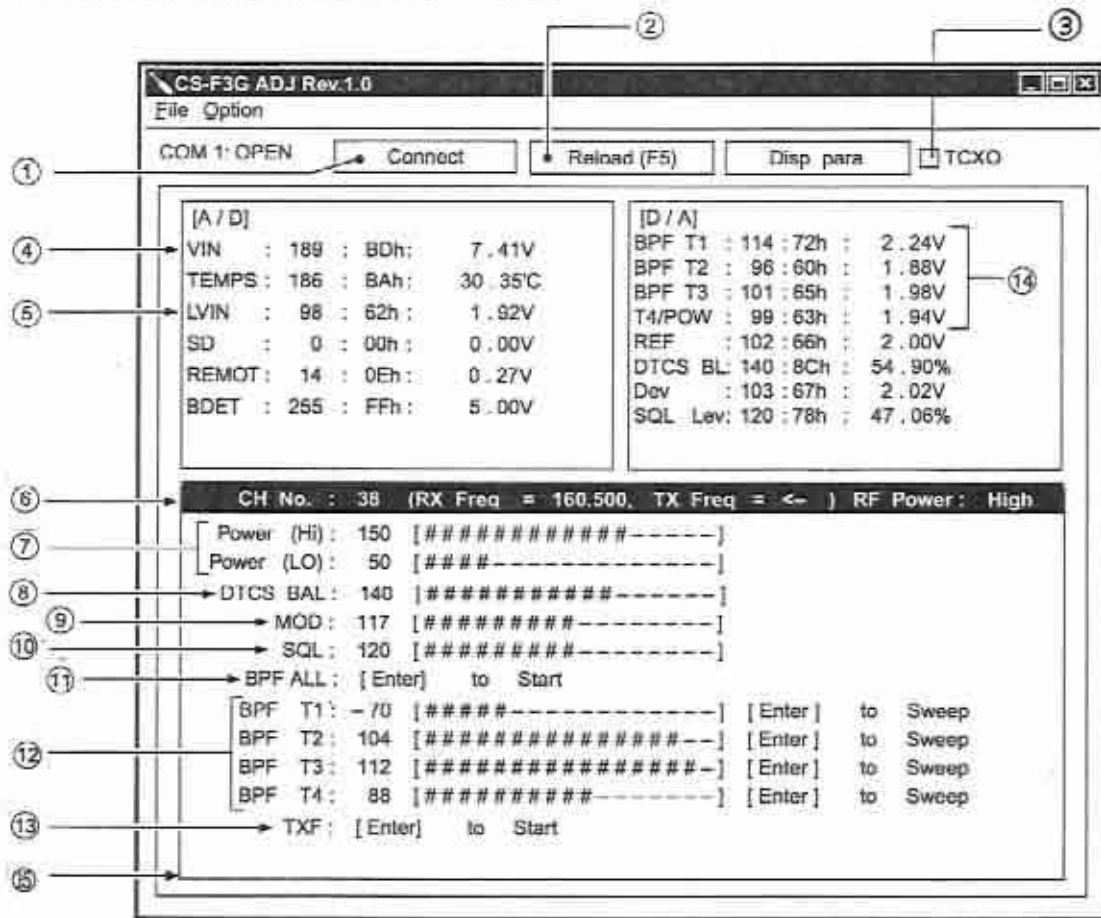
- 1 Boot up Windows.
 - Quit all applications when Windows is running.
- 2 Insert the backup disk1 into the appropriate floppy drive.
- 3 Select 'Run' from the [Start] menu.
- 4 Type the setup program name using the full path name, then push the [Enter] key. (A:\ setup)
- 5 Follow the prompts.
- 6 Program group 'CS-F3G ADJ' appears in the 'Programs' folder of the [Start] menu.

STARTING SOFTWARE ADJUSTMENT

- 1 Connect IC-F3GT/GS 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-F3G ADJ' in the 'Programs' folder of the [Start] menu, then CS-F3G ADJ's window is appeared.
- 4 Click the TCXO tag.
- 5 Click 'Connect' on the CS-F3G's window, then appears
- 6 IC-F3GT/GS's up-to-date condition.
Set or modify adjustment data as desired.

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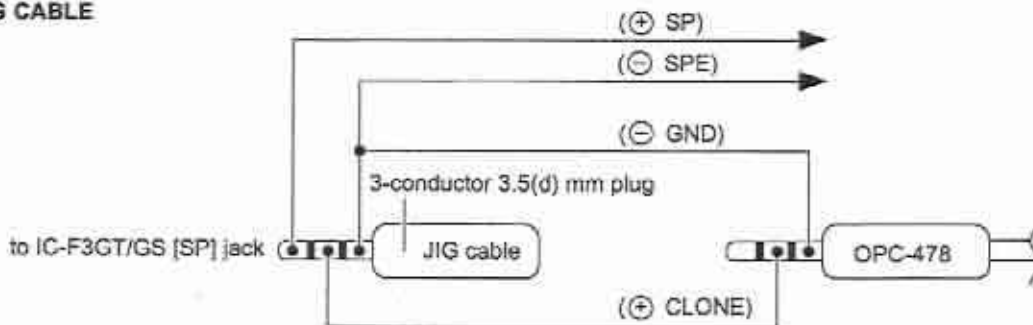
• ADJUSTMENT SOFTWARE'S SCREEN DISPLAY EXAMPLE



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

- | | |
|------------------------------------|---|
| ① : Transceiver's connection state | ⑨ : FM deviation |
| ② : Reload adjustment data | ⑩ : Squelch level |
| ③ : TCXO tag | ⑪ : Receive sensitivity (automatically) |
| ④ : Connected DC voltage | ⑫ : Receive sensitivity (manually) |
| ⑤ : PLL lock voltage | ⑬ : Reference frequency |
| ⑥ : Operating channel select | ⑭ : Receive sensitivity measurement |
| ⑦ : RF output power | ⑮ : Adjustment items |
| ⑧ : DTCS wave form | |

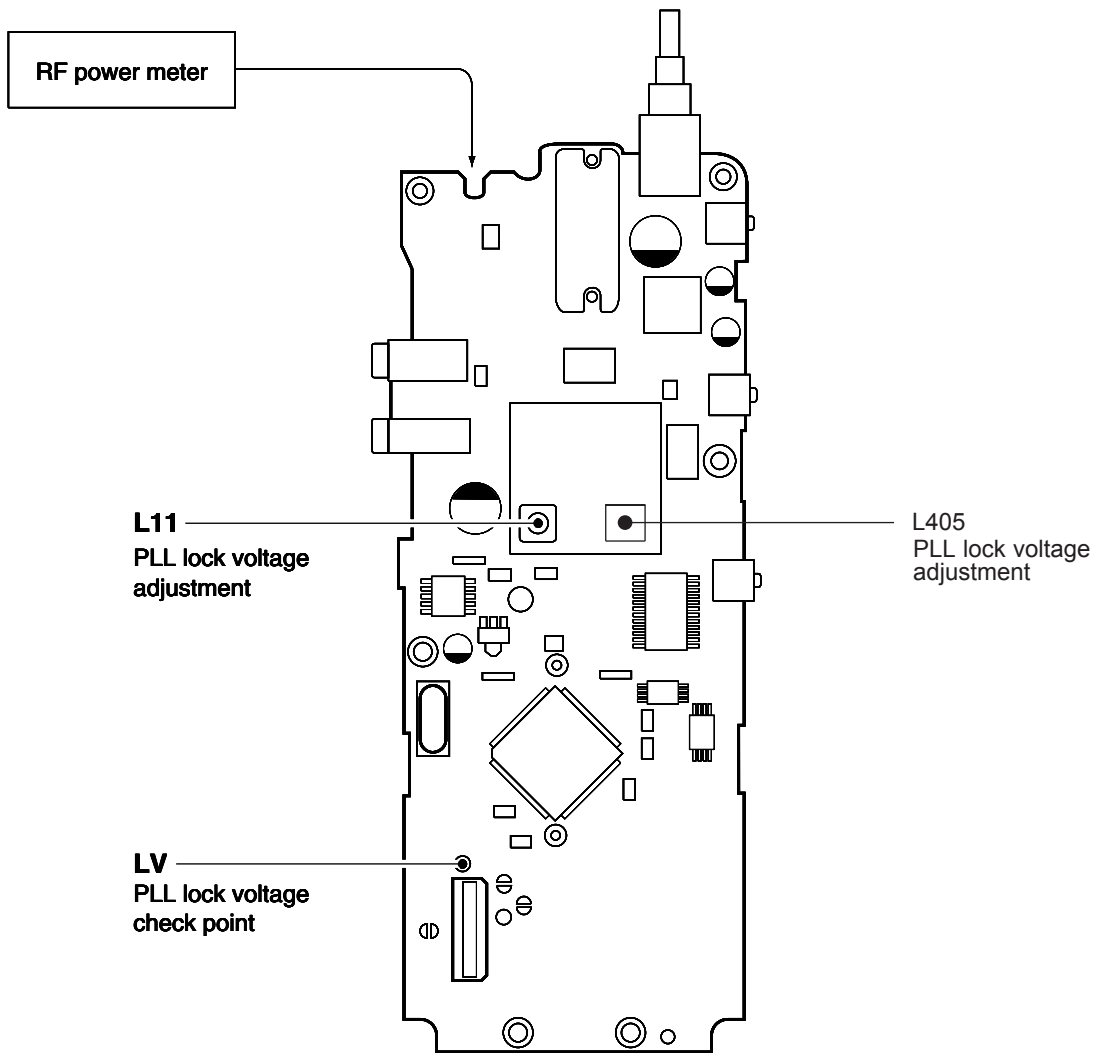
• JIG CABLE



5-2 PLL ADJUSTMENT

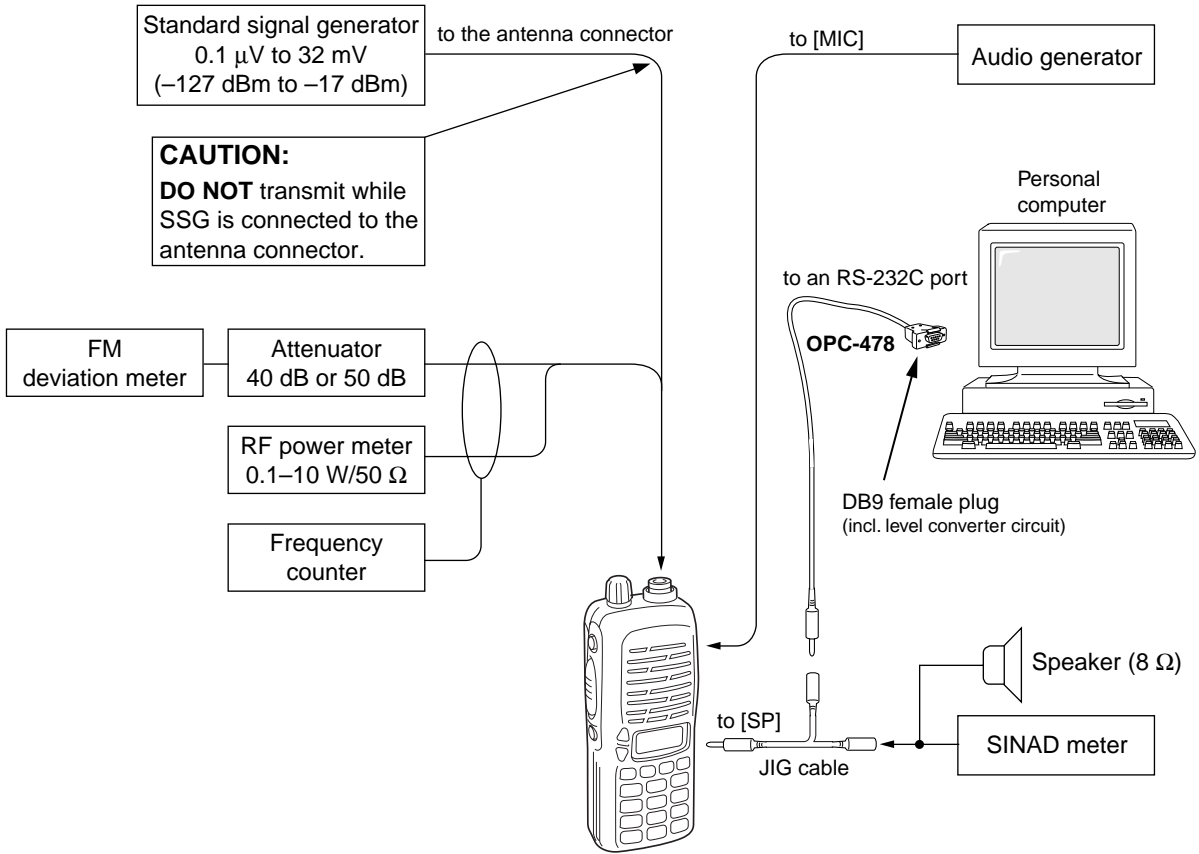
ADJUSTMENT	ADJUSTMENT CONDITIONS		MEASUREMENT		VALUE	ADJUSTMENT	
			UNIT	LOCATION		UNIT	ADJUST
PLL LOCK VOLTAGE	1	<ul style="list-style-type: none"> Operating frequency: 440.000 MHz Receiving 	MAIN	Connect a digital multi meter to check point LV.	1.3 V	MAIN	L11
	2	<ul style="list-style-type: none"> Transmitting 			1.3 V		L405
	3	<ul style="list-style-type: none"> Operating frequency: 470.000 MHz Receiving 			3.0-4.5 V		Verify
	4	<ul style="list-style-type: none"> Transmitting 			3.0-4.5 V		

• MAIN unit

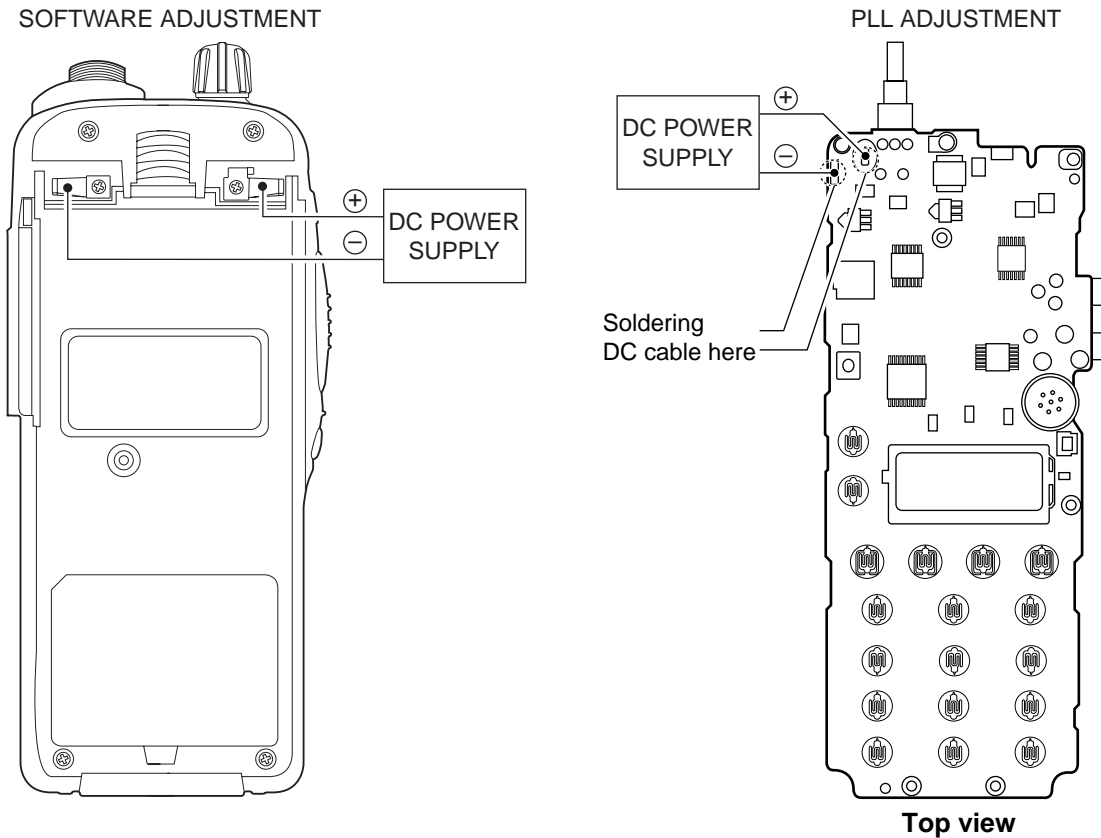


Bottom view

• CONNECTION

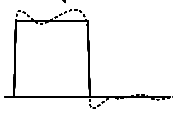


• DC POWER CABLE CONNECTIONS



5-3 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"> • Operating frequency: 440.000 MHz • High/Low switch : Low • Connect the RF power meter or 50 dummy load to the antenna connector. • Transmitting 	Top panel	Loosely couple a frequency counter to the antenna connector.	440.00000 MHz
OUTPUT POWER [POWER(LO)]	1 <ul style="list-style-type: none"> • Operating frequency: 440.000 MHz • High/Low switch : Low • Transmitting 	Top panel	Connect an RF power meter to the antenna connector.	1.0 W
[POWER(HI)]	2 <ul style="list-style-type: none"> • High/Low switch : High • Transmitting 			4.0 W
FM DEVIATION [MOD]	1 <ul style="list-style-type: none"> • Operating frequency: 440.000 MHz • High/Low switch : Low • Connect the audio generator to the [MIC] jack and set as: 1.0 kHz/150 mVrms • Set the FM deviation meter as: HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P-P)/2 • Transmitting 	Top panel	Connect an FM deviation meter to the antenna connector through the attenuator.	± 2.0 kHz
DTCS WAVE FORM [DTCS BAL]	1 <ul style="list-style-type: none"> • Operating frequency: 470.000 MHz • High/Low switch : Low • No audio applied to the [MIC] jack. • DTCS code : 007 • Transmitting 	Top panel	Connect an FM deviation meter with an oscilloscope to the antenna connector through an attenuator.	Set to flat wave form 

SOFTWARE ADJUSTMENT – continued

Select an operation using [] / [] keys, then set specified value using [-] / [] keys on the connected computer keyboard.

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE
		UNIT	LOCATION	
RX SENSITIVITY [BPF T1] – [BPF T4]	1 • Operating frequency: 440.000 MHz • Connect a standard signal generator to the antenna connector and set as: Frequency : 440.000 MHz Level : 3.2 μ V* (-97 dBm) Modulation : 1 kHz Deviation : \pm 1.75 kHz • Receiving	Top panel	Connect a SINAD meter with an 8 load to the [SP] jack.	Minimum distortion level
	<p>CONVENIENT: The BPF T1–BPF T4 can be adjusted automatically.</p> <p>q -1: Set the cursor to “BPF ALL” on the adjustment program and then push [ENTER] key.</p> <p>q -2: The connected PC tunes BPF T1–BPF T4 to peak levels. or</p> <p>w -1: Set the cursor to one of BPF T1, T2, T3, or T4 as desired. w -2: Push [ENTER] key to start tuning. w -3: Repeat w -1 and w -2 to perform additional BPF tuning.</p>			
SQUELCH LEVEL [SQL]	1 • Operating frequency: 440.000 MHz • Connect a standard signal generator to the antenna connector and set as: Frequency : 440.000 MHz Level : OFF Modulation : 1 kHz Deviation : \pm 1.75 kHz • Receiving	Top panel	Connect a SINAD meter with an 8 load to the [SP] jack.	12 dB SINAD
	2 • Receiving			At the point where the audio signals just appears.

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