SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

■ 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 Ω 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 µV–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 kΩ/V DC or better
Digital multimeter	Input impedance : 10 MΩ/V DC or better	Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
		AC millivoltmeter	Measuring range : 10 mV–10 V

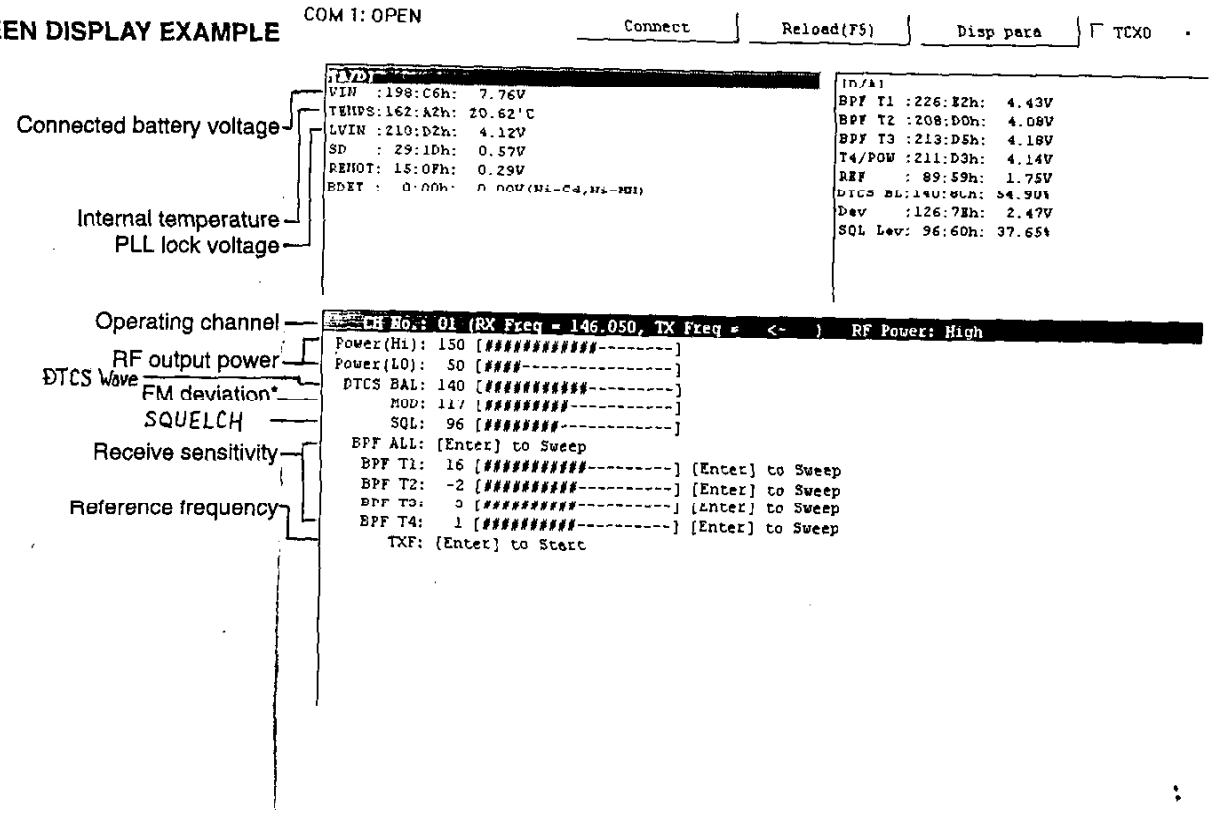
■ TRIMMER ADJUSTMENT

When you adjust the contents on page 5-4 or 5-5, TRIMMER ADJUSTMENT, the optional CS-F3G FIELD PROGRAMMING SOFTWARE (Rev. . or later) and OPC-478 CLONING CABLE are required.

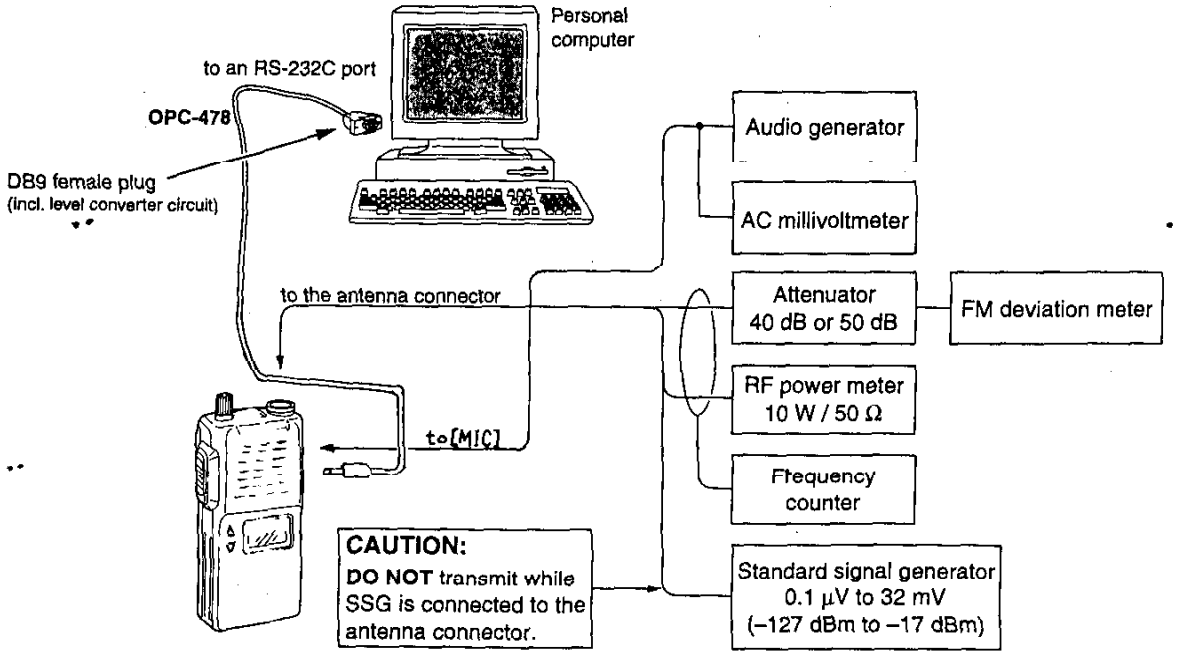
• STARTING TRIMMER ADJUSTMENT

Turn ON power to the transceiver, connect a computer to the [SP] jack using the optional OPC-478 CLONING CABLE, then start up the "Connect" program in CS-F3G

• SCREEN DISPLAY EXAMPLE



• CONNECTIONS



5-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT	
			UNIT	LOCATION		UNIT	ADJUST
PLL LOCK VOLTAGE	1	• Operating freq. : 136.000 MHz (L-band) 146.000 MHz (H-band) • Receiving	MAIN	Connect a multi-meter to check point LV.	2.0 V	MAIN	L11
	2	• Transmitting			1.5-2.5 V		Verify

5-3 TRIMMER ADJUSTMENT

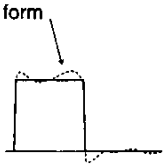
Select an operation using [↑]/[↓] keys, then set the specified value using [←]/[→] keys on the connected computer keyboard.

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE
			UNIT	LOCATION	
REFERENCE FREQUENCY	1	• Operating freq. : 136.000 MHz (L-band) 146.000 MHz (H-band) • High/Low switch : Low • Transmitting	Top panel	Loosely couple a frequency counter to the antenna connector.	136.000000 MHz (L-band) 146.000000 MHz (H-band)
	2	•Transmitting			136.001360 MHz (L-band) 146.001460 MHz (H-band)
OUTPUT POWER	1	• Operating freq. : 136.000 MHz (L-band) 146.000 MHz (H-band) • High/Low switch : Low • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	1.0 W
	2	• High/Low switch : High • Transmitting			5.0 W
FM DEVIATION	1	• Operating freq. : 143.000 MHz (L-band) 160.000 MHz (H-band) • High/Low switch : Low • Connect an audio generator to the [MIC] jack and set as: 1 kHz/150 mV • Set an 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 an attenuator.	±4.2 kHz (W-type) ±2.1 kHz (N-type) ±3.4 kHz (M-type)
BPF1–BPF4	1	• Operating freq. : 136.000 MHz (L-band) 146.000 MHz (H-band) • Set an SSG as: Level : 3.2 μV* (–97 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz (W-type) ±1.75 kHz (N-type) ±2.8 kHz (M-type) • Receiving	Top panel	Connect an SSG to the antenna connector and a SINAD meter with an 8 Ω load to the [SP] jack.	Minimum distortion level
		CONVENIENT: The BPF T1–BPF T4 can be adjusted automatically. ①-1 Set each to 0, then push the [Enter] key. (The cursor must be set to the BPF ALL position.) ①-2 The connected PC tunes BPF T1–BPF T4 to peak levels. **or** ②-1 Set the cursor to one of BPF T1, T2, T3 or T4 as desired. ②-2 Push [Enter] to start tuning. ②-3 Pepeat ②-1 and ②-2 to perform additional BPF tuning.			

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

5-3 TRIMMER ADJUSTMENT

The following adjustment must be performed after "REFERENCE FREQUENCY ADJUSTMENT" in section 5-3.

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE
			UNIT	LOCATION	
DTCS WAVE FORM	1	• Operating freq. : 143.000 MHz (L-band) 160.000 MHz (H-band) • 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 

The following adjustment must be performed after "BPF1–BPF4 ADJUSTMENT" in section 5-3.

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE
			UNIT	LOCATION	
SQUELCH LEVEL	1	• Operating freq. : 136.000 MHz (L-band) 146.000 MHz (H-band) • Set the SSG as: Modulation : 1kHz Deviation : ±3.5 kHz (W-type) ±1.75 kHz (N-type) ±2.8 kHz (M-type) • Receiving	Top panel	Connect an SSG to the antenna connector and SINAD meter with an 8 Ω load to the [SP] jack.	12 dB SINAD
	2	• Receiving			At the point where the audio signals just appears.