

IC-7800 ADJUSTMENT PROCEDURES

1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GREDE AND RANGE	EQUIPMENT	GREDE AND RENGE
AC outlet	Voltage : 85 V–265 V	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
RF power meter (terminated type)	Measuring range : 10–200 W Frequency range : 1.8–100 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–100 MHz Output level : 0.1 μ V–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–100 MHz Frequency accuracy : ± 0.5 ppm or better Sensitivity : 100 mV or better	Digital multimeter	Input impedance : 10 M Ω /DC or beter
RF voltmeter	Frequency range : 0.1–100 MHz Measuring range : 0.01–10 V	AC millivoltmeter	Measuring range : 10 mV–10 V
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
Modulation analyzer	Frequency range : At least 90 MHz Measuring range : 0–100 %	DC ammeter	Measurement capability: 1 A/30 A
Distortion meter	Frequency range : 1 kHz ± 10 % Measuring range : 1–100 %	Spectrum analyzer	Frequency range : At least 90 MHz Spectraum bandwidth : 100 kHz or more
Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V	Attenuator	Power attenuation : 50 or 60 dB Capacity : 150 W or more
		External speaker	Input impedance : 8 Ω Capacity : 5 W or more
		Terminator	Resistance : 50 and 150 Ω Capacity : 150 W or more

2 OSC UNIT ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
REFERENCE OUTPUT	1	<ul style="list-style-type: none"> Set the OSC unit to the external reference mode on the set mode. MAIN display frequency : 10.000 MHz Connect an SSG to J71 on the OSC unit and set as : <ul style="list-style-type: none"> Frequency : 10.000 MHz Level : 71 mV* (−10 dBm) Modulation : OFF Terminates J73 with 50 Ω. Receiving 	OSC	Connect an RF voltmeter to the J72.	Maximum voltage	OSC	L61, L62
REF IN OUTPUT	2	<ul style="list-style-type: none"> MAIN display frequency : 10.000 MHz Receiving 	OSC	Connect an RF voltmeter to the J72.	0 dBm ±3.0 dB		Verify
		<ul style="list-style-type: none"> Terminates J72 with 50 Ω. SUB display frequency : 10.000 MHz Receiving 		Connect an RF voltmeter to the J73.	0 dBm ±3.0 dB		Verify
REF OUT OUTPUT	3	<ul style="list-style-type: none"> Set the OSC unit to the internal reference mode on the set mode. MAIN display frequency : 10.000 MHz Receiving 	OSC	Connect an RF voltmeter to the J71.	−10.0 dBm ±3.0 dB		Verify
		<ul style="list-style-type: none"> Terminates J73 with 50 Ω. SUB display frequency : 10.000 MHz Receiving 		Connect an RF voltmeter to the J72.	0 dBm ±3.0 dB		Verify
		<ul style="list-style-type: none"> Terminates J72 with 50 Ω. SUB display frequency : 10.000 MHz Receiving 		Connect an RF voltmeter to the J73.	0 dBm ±3.0 dB		Verify

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

3 RX PLL-A UNIT ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
40M OUTPUT	1	<ul style="list-style-type: none"> MAIN display frequency : 40.000 MHz Mode : USB Receiving 	RX PLL-A	Connect an RF voltmeter to the CP701 (40MHz).	Maximum voltage	RX PLL-A	L702, L703
LPL LOCK VOLTAGE	1	<ul style="list-style-type: none"> MAIN display frequency : 0.030 MHz Mode : USB Receiving 	RX PLL-A	Connect a DC voltmeter to the CP1 (LV1).	2.0 V \pm 0.1 V	RX PLL-A	C154
	2	<ul style="list-style-type: none"> MAIN display frequency : 7.999 MHz Mode : USB Receiving 			Less than 3.0 V		Verify
HPL LOCK VOLTAGE (VCO1)	1	<ul style="list-style-type: none"> MAIN display frequency : 7.999 MHz Mode : USB Receiving 	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	6.0 V \pm 0.1 V	RX PLL-A	C222
(VCO2)	2	<ul style="list-style-type: none"> MAIN display frequency : 14.999 MHz Mode : USB Receiving 			6.0 V \pm 0.1 V		C232
(VCO3)	3	<ul style="list-style-type: none"> MAIN display frequency : 21.999 MHz Mode : USB Receiving 			6.0 V \pm 0.1 V		C242
(VCO4)	4	<ul style="list-style-type: none"> MAIN display frequency : 29.999 MHz Mode : USB Receiving 			6.0 V \pm 0.1 V		C252
(VCO5)	5	<ul style="list-style-type: none"> MAIN display frequency : 44.999 MHz Mode : USB Receiving 			6.0 V \pm 0.1 V		C262
(VCO6)	6	<ul style="list-style-type: none"> MAIN display frequency : 60.000 MHz Mode : USB Receiving 			6.0 V \pm 0.1 V		C272
(VCO1)	7	<ul style="list-style-type: none"> MAIN display frequency : 0.030 MHz Mode : USB Receiving 	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
(VCO2)	8	<ul style="list-style-type: none"> MAIN display frequency : 8.000 MHz Mode : USB Receiving 			1.8 V–2.8 V		Verify
(VCO3)	9	<ul style="list-style-type: none"> MAIN display frequency : 15.000 MHz Mode : USB Receiving 			1.8 V–2.8 V		Verify
(VCO4)	10	<ul style="list-style-type: none"> MAIN display frequency : 22.000 MHz Mode : USB Receiving 			1.8 V–2.8 V		Verify
(VCO5)	11	<ul style="list-style-type: none"> MAIN display frequency : 30.000 MHz Mode : USB Receiving 			1.8 V–2.8 V		Verify

RX PLL-A UNIT ADJUSTMENTS—Continued

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
HPL LOCK VOLTAGE (VCO6)	12	<ul style="list-style-type: none"> MAIN display frequency : 45.0 MHz Mode : USB Receiving 	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
R1 LO OUTPUT	1	<ul style="list-style-type: none"> MAIN display frequency : 14.999 MHz Mode : USB Receiving 	RX PLL-A	Connect an DC voltmeter to the J351 (R1LO).	2.25 dBm \pm 0.25 dB	RX PLL-A	R357
2LO LOCK VOLTAGE	1	<ul style="list-style-type: none"> MAIN display frequency : 14.100 MHz Mode : USB Receiving 	RX PLL-A	Connect an DC voltmeter to the CP3.	1.5 V \pm 0.3 V	RX PLL-A	C546
R2 LO OUTPUT	1	<ul style="list-style-type: none"> MAIN display frequency : 14.100 MHz Mode : USB Receiving 	RX PLL-A	Connect a spectrum analyzer to the J831 (R2LO).	Maximum level (–10 dBm \pm 3.0 dB)	RX PLL-A	L801, L834
T2 LO OUTPUT	1	<ul style="list-style-type: none"> MAIN display frequency : 14.100 MHz Mode : USB Receiving 	RX PLL-A	Connect a spectrum analyzer to the J561 (T2LO).	Maximum level (3.0 dBm \pm 3.0 dB)	RX PLL-A	L565, L566
RX SENSITIVITY	1	Pre-set the IC-7800 as below condition. <ul style="list-style-type: none"> MAIN display frequency : 14.150 MHz Mode : USB Dual watch : OFF MAIN Ant. : ANT1 Pre-amp. 1 : ON SUB AF : Minimum level Set R1228 to center position. Rotate L1058 to 8.5 turns in clockwise direction. Rotate L1401 to 2 turns in clockwise direction. Rotate L1402 to 2 turns in clockwise direction. Rotate L1403 to 3.5 turns in clockwise direction. Rotate L1404 to 3.5 turns in clockwise direction. Receiving 	RX PLL-A	Connect a DC voltmeter to the CP1102.	4.5 V \pm 0.1 V	RX PLL-A	R1101
				Connect a DC voltmeter to the CP1103.	4.5 V \pm 0.1 V	RX PLL-A	R1132
(HF)	2	<ul style="list-style-type: none"> MAIN display frequency : 14.150 MHz Mode : USB Connect an SSG to [ANT1] connector and set as : Frequency : 14.1515 MHz Level : 1 μV* (–107 dBm) Modulation: OFF Receiving 	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-A	L1408, L1058
IMAGE RESPONSE	1	<ul style="list-style-type: none"> MAIN display frequency : 14.150 MHz Mode : USB Connect an SSG to [ANT1] connector and set as : Frequency : 14.0765 MHz Level : 50 mV* (–13 dBm) Modulation: OFF Receiving 	Rear panel	Connect a spectrum analyzer to the [EXT SP] jack with 8 Ω load.	Minimum image	RX PLL-A	R1516, C1656

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

RX PLL-A UNIT ADJUSTMENTS—Continued

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
RX SENSITIVITY (50 MHz)	1	<ul style="list-style-type: none"> MAIN display frequency : 50.020 MHz Mode : USB Pre-amp. 2 : ON Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> Frequency : 50.0215 MHz Level : 0.32 μV* (–117 dBm) Modulation: OFF Receiving 	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-A	L1222
IF THROUGH (50 MHz)	1	<ul style="list-style-type: none"> MAIN display frequency : 50.020 MHz Mode : USB Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> Frequency : 64.455 MHz Level : 50 mV* (–13 dBm) Modulation: OFF Receiving 	Front panel	S-meter	Mimimum level	RX PLL-A	C1265

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

4 RX PLL-B UNIT ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
40M OUTPUT	1	<ul style="list-style-type: none"> • Dual watch : ON • SUB display frequency : 40.000 MHz • Mode : USB • Receiving 	RX PLL-B	Connect an RF voltmeter to the CP701 (40MHz).	Maximum voltage	RX PLL-B	L702, L703
LPL LOCK VOLTAGE	1	<ul style="list-style-type: none"> • SUB display frequency : 60.000 MHz • Mode : USB • Receiving 	RX PLL-B	Connect a DC voltmeter to the CP1 (LV1).	2.0 V \pm 0.1 V	RX PLL-B	C154
	2	<ul style="list-style-type: none"> • SUB display frequency : 1.499 MHz • Mode : USB • Receiving 			Less than 4.0 V		Verify
HPL LOCK VOLTAGE (VCO1)	1	<ul style="list-style-type: none"> • SUB display frequency : 7.999 MHz • Mode : USB • Receiving 	RX PLL-B	Connect a DC voltmeter to the CP2 (LV2).	6.0 V \pm 0.1 V	RX PLL-B	C222
(VCO2)	2	<ul style="list-style-type: none"> • SUB display frequency : 14.999 MHz • Mode : USB • Receiving 			6.0 V \pm 0.1 V		C232
(VCO3)	3	<ul style="list-style-type: none"> • SUB display frequency : 21.999 MHz • Mode : USB • Receiving 			6.0 V \pm 0.1 V		C242
(VCO4)	4	<ul style="list-style-type: none"> • SUB display frequency : 29.999 MHz • Mode : USB • Receiving 			6.0 V \pm 0.1 V		C252
(VCO5)	5	<ul style="list-style-type: none"> • SUB display frequency : 44.999 MHz • Mode : USB • Receiving 			6.0 V \pm 0.1 V		C262
(VCO6)	6	<ul style="list-style-type: none"> • SUB display frequency : 60.000 MHz • Mode : USB • Receiving 			6.0 V \pm 0.1 V		C272
(VCO1)	7	<ul style="list-style-type: none"> • SUB display frequency : 0.030 MHz • Mode : USB • Receiving 	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
(VCO2)	8	<ul style="list-style-type: none"> • SUB display frequency : 8.000 MHz • Mode : USB • Receiving 			1.8 V–2.8 V		Verify
(VCO3)	9	<ul style="list-style-type: none"> • SUB display frequency : 15.000 MHz • Mode : USB • Receiving 			1.8 V–2.8 V		Verify
(VCO4)	10	<ul style="list-style-type: none"> • SUB display frequency : 22.000 MHz • Mode : USB • Receiving 			1.8 V–2.8 V		Verify
(VCO5)	11	<ul style="list-style-type: none"> • SUB display frequency : 30.000 MHz • Mode : USB • Receiving 			1.8 V–2.8 V		Verify

RX PLL-B UNIT ADJUSTMENTS—Continued

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
HPL LOCK VOLTAGE (VCO6)	12	<ul style="list-style-type: none"> SUB display frequency : 45.000 MHz Mode : USB Receiving 	RX PLL-B	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
S1 LO OUTPUT	1	<ul style="list-style-type: none"> SUB display frequency : 14.999 MHz Mode : USB Receiving 	RX PLL-B	Connect an RF voltmeter to the J351 (S1LO).	2.25 dBm \pm 0.25 dB	RX PLL-B	R357
2LO LOCK VOLTAGE	1	<ul style="list-style-type: none"> SUB display frequency : 14.100 MHz Mode : USB Receiving 	RX PLL-B	Connect a DC voltmeter to the CP3.	1.5 V \pm 0.3 V	RX PLL-B	C546
2LO OUTPUT	1	<ul style="list-style-type: none"> MAIN display frequency : 14.100 MHz Mode : USB Receiving 	RX PLL-B	Connect a spectrum analyzer to the J561 (2LO).	Maximum level (–9.0 dBm \pm 3.0 dB)	RX PLL-B	L565, L566
RX SENSITIVITY	1	Pre-set the IC-7800 as below condition. <ul style="list-style-type: none"> SUB display frequency : 14.150 MHz Mode : USB Dual watch : ON MAIN Ant. : ANT2 SUB Ant. : ANT1 Pre-amp. 1 : ON MAIN AF : Minimum level Set R1228 to center position. Rotate L1401 to 2 turns in clockwise direction. Rotate L1402 to 2 turns in clockwise direction. Rotate L1403 to 3.5 turns in clockwise direction. Rotate L1404 to 3.5 turns in clockwise direction. Receiving 	RX PLL-B	Connect a DC voltmeter to the CP1102.	4.5 V \pm 0.1 V	RX PLL-B	R1101
				Connect a DC voltmeter to the CP1103.	4.5 V \pm 0.1 V	RX PLL-B	R1132
(HF)	2	<ul style="list-style-type: none"> SUB display frequency : 14.150 MHz Mode : USB Connect an SSG to [ANT1] connector and set as : Frequency : 14.1515 MHz Level : 1 μV* (–107 dBm) Modulation: OFF Receiving 	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-B	L1408, L1058
IMAGE RESPONSE	1	<ul style="list-style-type: none"> SUB display frequency : 14.150 MHz Mode : USB Connect an SSG to [ANT1] connector and set as : Frequency : 14.0765 MHz Level : 50 mV* (–13 dBm) Modulation: OFF Receiving 	Rear panel	Connect a spectrum analyzer to the [EXT SP] jack with 8 Ω load.	Minimum image	RX PLL-B	R1516, C1656

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

RX PLL-B UNIT ADJUSTMENTS—Continued

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
RX SENSITIVITY (50 MHz)	1	<ul style="list-style-type: none"> SUB display frequency : 50.020 MHz Mode : USB Pre-amp. 2 : ON Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> Frequency : 50.0215 MHz Level : 0.32 μV* (–117 dBm) Modulation: OFF Receiving 	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-B	L1222
IF THROUGH (50 MHz)	1	<ul style="list-style-type: none"> SUB display frequency : 50.020 MHz Mode : USB Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> Frequency : 64.455 MHz Level : 50 mV* (–13 dBm) Modulation: OFF Receiving 	Front panel	S-meter	Mimimum level	RX PLL-B	C1265

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

4-5 PA200W BOARD ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
IDLING CURRENT (For driver)	1	<ul style="list-style-type: none">• Preset R301, R407, R410 on the PA200W unit to max. CCW.• [MIC] gain : max. CCW• Main display frequency : 14.100 MHz• Mode : USB• Apply no audio signals to the [MIC] connector.• Transmitting	PA200W	Connect an ammeter between W1 and the transceiver.	1.0 A higher	PA200W	R301
(For final amplifier)	2	<ul style="list-style-type: none">• Transmitting			1.0 A higher		R407 R425
	3	<ul style="list-style-type: none">• Transmitting			1.0 A higher		R410 R426

6 TUNER UNIT ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
SWR DETECTOR	1	<ul style="list-style-type: none"> • Main display frequency : 24.950 MHz • Mode : FM • [RF POWER] : Max. CW (200W) • [TUNER] : Through • APC : OFF • Connect a 50 Ω terminator to [ANT1] connector. • Transmitting 	CTRL	Connect a digital multimeter or oscilloscope to the check point CP101 (REF).	Minimum voltage	CTRL	C104
		ADJUSTMENT CONDITION	DISPLAY		OPERATION		
TUNER REFERENCE	1	<ul style="list-style-type: none"> • Enter the tuner adjustment mode: <ol style="list-style-type: none"> ① Turn power OFF. ② Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug. ③ While pushing [M.SCOPE] and [EXIT/SET], turn power ON. 	TUNER-ADJUST MODE		Push [F-7 (START)] to start tuning.		
	2		-- TUNER -- Adjusting Now		Verify the display shows "Adjusting Now".		
	3		-- TUNER -- OK		Verify the display shows "OK".		

7 MAIN UNIT ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
MAXIMUM OUTPUT POWER	1	<ul style="list-style-type: none"> • Turn the power OFF • Push and hold [F-INP] and [MW], and then turn the power ON. • Preset R93 to 3 o'clock position. • MAIN display frequency : Any • Mode : USB 	MAIN	Connect a digital multimeter or oscilloscope to the check point CP82.	0.5 V \pm 0.2 V	MAIN	R69
	2	<ul style="list-style-type: none"> • Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mV • Transmitting 	Rear panel	Connect an RF power meter to the [ANT1] connector.	Maximum output power	MAIN	L505 C576 L512
RESIDUAL AM	3	<ul style="list-style-type: none"> • Mode : FM • Connect an audio generator to the [MIC] connector and set as: Frequency : 1.0 kHz Level : 10 mV • Transmitting 	Rear panel	Connect an RF power meter to the [ANT1] connector.			verify
	4	<ul style="list-style-type: none"> • Apply no audio signals to the [MIC] connector. • Transmitting 			Minimum level difference between an audio generator is ON and OFF.	MAIN	C576
TX TOTAL GAIN	1	<ul style="list-style-type: none"> • MAIN display frequency : Any • Mode : USB • [MIC] GAIN : 12 o'clock position • Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mV • Transmitting 	Rear panel	Connect an RF power meter to the [ANT1] connector.	130 W	MAIN	R538
HIGH POWER (HF)	1	<ul style="list-style-type: none"> • MAIN display frequency : 14.100 MHz • Mode : RTTY • Transmitting 	Rear panel	Connect an RF power meter to the [ANT1] connector.	200 W	MAIN	R81
(50 MHz)	2	<ul style="list-style-type: none"> • MAIN display frequency : 50.100 MHz • Mode : RTTY • Transmitting 			200 W		R79
AM CARRIER POWER	1	<ul style="list-style-type: none"> • MAIN display frequency : 14.100 MHz • Mode : AM • Apply no audio signals to the [MIC] connector. • Transmitting 	Rear panel	Connect an RF power meter to the [ANT1] connector.	55 W	MAIN	R82
Id-APC	1	<ul style="list-style-type: none"> • MAIN display frequency : 14.100 MHz • Mode : RTTY • Connect CP81 to GND. • Preset R93 to 90° CCW. • Transmitting 	PA	Connect an ammeter between the PA unit and the W1.	12 A	MAIN	R93

4-8 SCOPE UNIT ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
S3 LO LOCK VOLTAGE	1 Pre-set the IC-7800 as below condition. <ul style="list-style-type: none"> • Dual watch : OFF • Pre-amp. : OFF • Attenuator : OFF • Scope : ON • Scope attenuator: OFF • MAIN display frequency : 14.200 MHz • Mode : CW • Span : ± 25 kHz • Receiving 	SCOPE	Connect a digital voltmeter to the CP801.	2.5 V	SCOPE	C824
SCOPE	1 • Connect an SSG to the [ANT1] connector and set as : Frequency : 14.200 MHz Level : 500 μ V* (–53 dBm) Modulation: OFF • Receiving	Front panel	Scope wave on the LCD.	Maximum wave form	SCOPE	L203 L202 L201 L5 L6 C41
	2 • Connect an SSG to J1 and set as: Frequency : 71.715 MHz Level : 100 mV* (–7 dBm) Modulation: OFF • Receiving			Mimimum wave form		C41
	3 • Set an SSG as: Frequency : 14.200 MHz Level : 500 μ V* (–53 dBm) Modulation: OFF • Receiving			Maximum wave form		L5 L6
SCOPE GAIN	1 • MAIN display frequency : 14.200 MHz • Mode : CW • Connect an SSG to J1 and set as: Frequency : 14.200 MHz Level : 500 μ V* (–53 dBm) Modulation: OFF • Receiving	Front panel	Scope wave on the LCD.	Set peak of scope wave form to 6 marks on the LCD.	SCOPE	R416
SCOPE ATTENUATOR	1 • MAIN display frequency : 14.200 MHz • Mode : CW • Scope attenuator: 30 dB • Connect an SSG to J1 and set as: Frequency : 14.200 MHz Level : 500 μ V* (–53 dBm) Modulation: OFF • Receiving	Front panel	Scope wave on the LCD.	Set peak of scope wave form to 3 marks on the LCD.	SCOPE	R11

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

9 AUTOMATICALLY ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	DISPLAY	OPERATION
ENTERING ADJUSTMENT MODE	1	<ul style="list-style-type: none"> Enter the adjustment mode: <ol style="list-style-type: none"> Turn power OFF. Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug. While pushing [SSB] and [CW/RTTY], turn power ON. 	ADJUST MODE	<p>Push [F-1 (METER)], [F-2 (TX)] or [F-3 (RX)] to select each adjustment mode.</p> <p>Once entering adjustment mode, use [F-1 (▼)] to skip items, or [F-2 (EXIT)] to return the opening display.</p>
CAUTION: NEVER select adjustment items [F-2 (TX)] while transceiver is connected to an SSG. Because transceiver automatically transmits when transmit item in the [F-2 (TX)] is selected.				
HF PO METER	1	<ul style="list-style-type: none"> Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 10 mVrms Connect an RF power meter to the [ANT1] connector. Connect a load which becomes SWR is 2 to the [ANT2] connector. Push [F-2 (TX)] to enter the meter scale adjustment. 	HF POWER 0W	Push [F-7 (SET)] to set the 0 W meter automatically, to store the "0 W" meter into memory, and to step next.
	2		HF POWER 10W	Set the RF power meter to 20 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "20 W" meter into memory, and to step next.
	3		HF POWER 50W	Set the RF power meter to 50 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "50 W" meter into memory, and to step next.
	4		HF POWER 100W	Set the RF power meter to 100 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "100 W" meter into memory, and to step next.
	5		HF POWER 200W	Set the RF power meter to 195 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "200 W" meter into memory, and to step next.
50 MHz PO METER	1		50M POWER 0W	Push [F-7 (SET)] to set the 0 W meter automatically, to store the "0 W" meter into memory, and to step next.
	2		50M POWER 10W	Set the RF power meter to 20 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "20 W" meter into memory, and to step next.
	3		50M POWER 50W	Set the RF power meter to 50 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "50 W" meter into memory, and to step next.
	4		50M POWER 100W	Set the RF power meter to 100 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "100 W" meter into memory, and to step next.
	5		50M POWER 200W	Set the RF power meter to 195 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "200 W" meter into memory, and to step next.
ALC METER	1		ALC	Push [F-7 (SET)] to set the ALC meter automatically, to store the "ALC" meter into memory, and to step next.
DRIVE LEVEL	1		DRIVE	Push [F-7 (SET)] to set the DRIVE meter automatically, to store the "DRIVE" meter into memory, and to step next.
Vd METER	1		Vd48V	Push [F-7 (SET)] to set the Vd meter automatically, to store the "Vd" meter into memory, and to step next.

AUTOMATICALLY ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
Id METER	1 • Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 10 mVrms • Connect an RF power meter to the [ANT1] connector. • Connect a load which becomes SWR is 2 to the [ANT2] connector.	Id 0A	Push [F-7 (SET)] to set the 0 A meter automatically, to store the “0 A” meter into memory, and to step next.
		Id 5A	Set the Id meter (Front panel) to 5 A using [MAIN DIAL]. Then push [F-7 (SET)] to store the “5 A” meter into memory, and to step next.
		Id 10A	Set the Id meter (Front panel) to 10 A using [MAIN DIAL]. Then push [F-7 (SET)] to store the “10 A” meter into memory, and to step next.
		SWR	Push [F-7 (SET)] to set the SWR meter automatically, to store the “SWR” meter into memory, and to step next.
HF TOTAL GAIN	1 • Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (–47 dBm) Modulation : OFF • Connect an AC millivolt meter to [SP] jack with an 8 Ω load.	Total Gain A HF PRE OFF	Set the AF output level to 0 dB.
			Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
		Total Gain A HF PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
		Total Gain A 50M PRE OFF	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
		Total Gain A 50M PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	2 • Set the SSG as: Level : OFF	Total Gain B HF PRE OFF	Set the AF output level to 0 dB.
			Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HF B total gain into memory, and to step next.
		Total Gain B HF PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
		Total Gain B 50M PRE OFF	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
		Total Gain B 50M PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.

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

AUTOMATICALLY ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
EXTERNAL AGC	1 • Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 3.2 mV* (−37 dBm) Modulation : OFF	AGC(RX-DSP)A	Push [F-7 (SET)] to set the external AGC automatically, to store the external AGC into memory, and to step next.
	2	AGC(RX-DSP)B	Push [F-7 (SET)] to set the external AGC automatically, to store the external AGC into memory, and to step next.
S-METER	1 • Set the SSG as: Level : OFF	HF S0 LEVEL	• Push [F-7 (SET)] to set the S0 meter automatically, to store the S0 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	2 • Set the SSG as: Level : 50 μ V* (−73 dBm)	HF S9 LEVEL	• Push [F-7 (SET)] to set the S9 meter automatically, to store the S9 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	3 • Set the SSG as: Level : 50 mV* (−13 dBm)	S9+60 LEVEL	• Push [F-7 (SET)] to set the S9+60 meter automatically, to store the S9+60 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
50 MHz TOTAL GAIN	1 • Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (−47 dBm) Modulation : OFF • Connect an AC millivolt meter to [SP] jack with an 8 Ω load.	Total Gain A 50M PRE OFF	Set the AF output level to 0 dB.
	2 • Set the SSG as: Level : OFF		Set the AF output level to −30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	3	Total Gain A 50M PRE ON	Set the AF output level to −30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	4	Total Gain A 50M PRE OFF	Set the AF output level to −30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	5	Total Gain A 50M PRE ON	Set the AF output level to −30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	6 • Set the SSG as: Level : 1 mV* (−47 dBm)	Total Gain B 50M PRE OFF	Set the AF output level to 0 dB.
	7 • Set the SSG as: Level : OFF		Set the AF output level to −30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HF B total gain into memory, and to step next.
	8	Total Gain B 50M PRE ON	Set the AF output level to −30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HF B total gain into memory, and to step next.

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AUTOMATICALLY ADJUSTMENTS—Continued

ADJUSTMENT		ADJUSTMENT CONDITION	DISPLAY	OPERATION
50 MHz TOTAL GAIN	9	<ul style="list-style-type: none"> Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (–47 dBm) Modulation : OFF Connect an AC millivolt meter to [SP] jack with an 8 Ω load. 	Total Gain B 50M PRE OFF	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
	10		Total Gain B 50M PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
50 MHz EXTERNAL AGC	1	<ul style="list-style-type: none"> Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 3.2 mV* (–37 dBm) Modulation : OFF 	AGC(RX-DSP)A	Push [F-7 (SET)] to set the external AGC automatically, to store the external AGC into memory, and to step next.
	2		AGC(RX-DSP)B	Push [F-7 (SET)] to set the external AGC automatically, to store the external AGC into memory, and to step next.
50 MHz S-METER	1	<ul style="list-style-type: none"> Set the SSG as: Level : OFF 	50M S0 LEVEL	<ul style="list-style-type: none"> Push [F-7 (SET)] to set the S0 meter automatically, to store the S0 meter into memory, and to step next. Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	2	<ul style="list-style-type: none"> Set the SSG as: Level : 50 μV* (–73 dBm) 	50M S9 LEVEL	<ul style="list-style-type: none"> Push [F-7 (SET)] to set the S9 meter automatically, to store the S9 meter into memory, and to step next. Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	3	<ul style="list-style-type: none"> Set the SSG as: Level : 50 mV* (–13 dBm) 	S9+60 LEVEL	<ul style="list-style-type: none"> Push [F-7 (SET)] to set the S9+60 meter automatically, to store the S9+60 meter into memory, and to step next. Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
REFERENCE FREQUENCY	1	<ul style="list-style-type: none"> Connect a frequency counter to the MAIN unit, J490. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> NOTE: This adjustment need to adjust after more than 5 minutes past since IC 7800 is power ON. </div>	REF OSC	Set the Reference frequency to 10.000000 MHz using [MAIN DIAL]. Then push [F-7 (SET)] to store the Reference frequency into memory, and to step next.

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