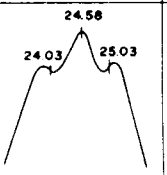
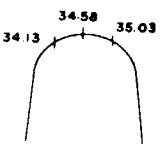
ADJUSTMENTS

Item	Condition	Measurement: Test equipment	Measurement: Unit	Measurement: Terminal	Adjustment: Unit	Adjustment: Parts	Adjustment: Method	Specification	Remarks
11. BPF-B adjustment	Disconnect connectors 1 and 5 on the PLL unit. Connect the cathode of D27 (1S1555) to the jumper wire next to R44 with a clip lead. Connect the cathode of D50 (1S1587) to the jumper wire next to TC1 with a clip lead. Connect the RF output of the sweep generator to R111 (100Ω) via a 15PF capacitor.	Sweep generator Oscilloscope	PLL	Q35 Ⓔ	PLL	T7 T8 T9 T17	Adjust T7 ~ T9 until the response shown at the right is obtained. Then adjust T17 for maximum amplitude.		
12. BPF-C adjustment	Disconnect connectors 1 and 5 on the PLL unit. Connect the cathode of D26 (1S1555) to the jumper wire next to R44 with a clip lead. Connect the cathode of D50 (1S1587) to the jumper wire next to TC1 with a clip lead.					T10 T11 T12 T18	Adjust T10 through T12 until the band response shown at right is obtained. Then adjust T18 for maximum amplitude.		
13. VFO, MIX spurious adjustment NOTE: This adjustment should be done after completing the adjustment (or check) of BPF-A.	Disconnect connector 1 on the PLL unit. Connect the cathode of D24 (1S1555) to the jumper wire next to R44 with a clip lead. VFO 250 MODE CW	Spectrum analyzer (Monitor receiver)				VR1	Minimum (14.99 MHz)	Less than −55dB	
13'. Balance adjustment TS-830M only	BAND: 7 VFO: 150 MODE: AM Connect the SSG output (7.15 MHz, 10dB) to the ANT terminal.	Oscilloscope, AF VTVM	Rear panel	EXT. SP	RF IF	VR1 VR9	Beat output for minimum		TS-830M only
14. Carrier balance adjustment	IF SHIFT Centered RF GAIN Fully counter-clockwise	RF VTVM	Rear panel	IF OUT 2	IF	TC1	Minimum		
15. IF AMP adjustment	BAND: 1.5 VFO: 400 DRIVE: 12 : 00 RF GAIN: fully clockwise IF SHIFT: centered RF ATT: OFF MODE: USB AGC: OFF NOTCH SW: OFF NB SW: OFF	AF VTVM Oscilloscope	Rear panel	EXT. SP	RF	ANT coil 1.8 RF coil 1.8 T2	Max. audio output		
	VBT: fully clockwise TONE: fully clockwise SG SW: OFF Connect the SSG output (1.9 MHz, 40 dB) to the antenna terminal. While adjusting, gradually decrease the SSG output level down to −6 dB.				IF	L2 L3 L4 L5 L6 L7 L9 L11			
16. Coil pack adjustment	Connect the SSG (40 dB) to the ANT terminal. DRIVE 12:00 While adjusting, gradually decrease the SSG output level down to −6 dB. Adjust at the following points:	AF VTVM Oscilloscope	Rear panel	EXT. SP	RF	ANT coil RF coil	Max. audio output		

No.	BAND	VFO	f	
1	1.5	400	1.9 MHz	1.8
2	3.5	250	3.75	3.5
3	7	150	7.15	7
4	10	125	10.125	10
5	14	175	14.175	14

Item	Condition	Measurement: Test equipment	Measurement: Unit	Measurement: Terminal	Adjustment: Unit	Adjustment: Parts	Adjustment: Method	Specification	Remarks
	6 18 125 18.125					18			
	7 21 225 21.225					21			
	8 24.5 450 24.950					24			
	9 28.5 300 28.800					28			
17. ALC "0" adjustment	METER ALC STBY SEND				IF	VR6	ALC meter starting point		
18. Generator, Drive coil adjustment	CAL ON CAR VR Centered HEATER ON MODE CW METER ALC SG SW OFF RF ATT ON Receive the marker frequency in the following bands and obtain the peak level by adjusting the DRIVE control. Set the STBY switch to SEND and adjust each coil.				RF	DRIVE coil	Max. ALC meter reading		
	BAND 1.5 / VFO 400					1.8			
	BAND 3.5 / VFO 250					3.5			
	BAND 7 / VFO 150					7			
	BAND (10) / VFO (125)					10			
	BAND 14 / VFO 175					14			
	BAND (18) / VFO (125)					18			
	BAND 21 / VFO 225					21			
	BAND (24.5) / VFO (450)					24.5			
	BAND 28.5 / VFO 300					28			
	BAND 14, VFO 175 Adjust the CAR control until the ALC meter reads maximum.				RF IF	T4 L24 L25 L28 L29	Max. ALC meter reading		
	STBY REC								
18' AM adjustment and S/N check TS-830 M only	BAND: 14 VFO: 175 MODE: AM Connect the SSG output (14.175MHz, 40dB, MOD: 1kHz, 30%) to the ANT terminal.	AF VTVM, Oscilloscope	Rear Panel	EXT. SP	AM	T_1	Max. audio output		TS-830 M only
	SSG Output: 12 dB TONE: Centered						Adjust the DRIVE Control for max. AF Output. Set to 0.63V/8Ω with AF GAIN Control.		
	SSG MOD: OFF							Less than 0.2V/8Ω (S/N more than 10 dB)	
19. MIX balance adjustment	RF ATT ON BAND 1.5 VFO 0	Oscilloscope	Rear panel	IF OUT 1	RF	VR1	Minimum		Except TS-830M
20. IF trap adjustment	BAND: Between 1.5 and Aux. Connect the SSG (8.83 MHz, 80 dB) to the ANT terminal.	Oscilloscope AF VTVM	Rear panel	EXT. SP	RF	L22 L3 L4	Minimum Adjust in the order of L22 ~ L4.		Preset the slugs of L3 and L4 fully clockwise.
21. S meter adjustment	AGC OFF				IF	VR2	Set to the deflection starting point		
	BAND 14 VFO 175 AGC FAST	Oscilloscope AF VTVM	Rear panel	EXT. SP			Adjust the DRIVE control for maximum AF output.		
	Connect the SSG (14.174 MHz, 8dB) to the ANT terminal								

( ): See note **Before** adjustment

Note:

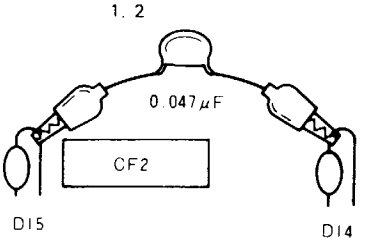
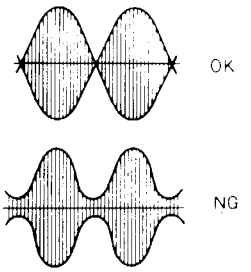
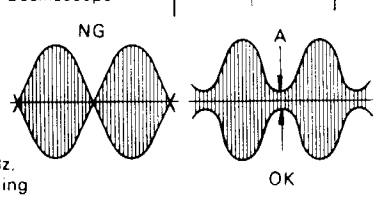
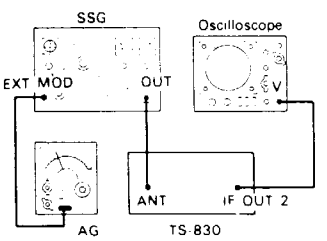
TRANSMITTING ON WARC BANDS

As supplied, the TS-830S will receive but not transmit on the 3 new WARC bands. If transmit capability is desired, a minor wiring change is required.

1. For all 3 bands: Break the line between the RF unit X44-1360-00, connector #6, Pin #1 (TOF terminal) and AF unit X49-1140-00, connector #6, Pin #4 (TOF terminal).
2. Or, for individual Bands: On the RF unit X44-1360-00

Band	Remove (or Cut) Part
10 MHz	**D4**
18 MHz	**D5**
24.5 MHz	**D6**

ADJUSTMENTS

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
					IF	L9	Turn the coil slug counterclockwise until S-1 is obtained.		
	SSG output: 40 dB * Repeat S-1, 9 adjustment several times.					VR3	Set to S-9		
22. NB adjustment	NB LEVEL: fully counter-clockwise BAND 14, VFO: 175 Connect the SSG output (14.175 MHz, 60 dB) to the ANT terminal.	DVM	AF	TP4	AF	T1 T2	Minimum		
	SSG output: 20 dB Adjust as described above.								
	AGC FAST Disconnect the SSG output from the ANT terminal, and connect the noise generator output in it's place. Set the noise generator output level to S5 ~ 7.	Speaker	Rear panel	EXT. SP					
	NB ON							The NB must provide adequate effect.	
					If adequate effect is not obtained, repeat the adjustment several times.				
	Reduce the noise generator output level to below the threshold of sensitivity. Turn the NB LEVEL control fully clockwise.							Noise must be blanked.	
	NB OFF								
23. VBT adjustment with VBT-1	MODE CW.N IF SHIFT Centered VBT Fully clockwise Disconnect connector ⑪ on the IF unit. Connect the VBT-1 output to IF OUT 1, and connect the oscilloscope to IF OUT 2. Connect a 0.047μF capacitor across D14 and D15 on the IF unit. Set the filter switching terminal connection to CW3. Adjust the control on the VBT-1 until the waveform shown at right is observed on the oscilloscope.	Oscilloscope VBT-1	IF OUT 1, 2				 		This adjustment requires the use of the VBT-1. If the VBT-1 is unavailable, this adjustment will be difficult.
	Set the MODE switch to CW.W.				IF	TC2	Adjust until the waveform shown in the preceding item is obtained.		
	Remove 0.047 μF capacitor. Reconnect connector ⑪								
23'. VBT adjustment with SSG, AG and Oscilloscope	BAND 1.5 MODE CW.N IF SHIFT Centered VBT Fully clockwise Disconnect connector ⑪ on the IF unit. Connect a 0.047 μF capacitor across D14 and D15 on the IF unit. Filter SW terminal: CW3 Receive SSG signal (1.9 MHz, 60 dB), and set the main tuning to obtain waveform shown at right. MODE CW.W	SSG, AG, Oscilloscope	Rear panel	IF OUT 2	IF	TC2	Adjust TC2 until part A becomes null.   f = 1.2 kHz Level: Level for max. AM modulation.		
	Filter SW terminal: CW1								

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
24. NOTCH adjustment	NOTCH OFF BAND 1.5 VFO 400 AGC FAST NOTCH Centered Turn VR1 on the IF unit fully counterclockwise. Couple the SSG output (1.9 MHz, 40 dB) to the ANT terminal.	Oscilloscope AF VTVM F.counter	Rear panel	EXT SP			Set beat frequency to 1500 Hz and audio level 0.63V/8Ω		
	NOTCH ON				IF	L10, VR1	Min. audio level	*Repeat a few times	
	Rotate NOTCH.							The dip point should be located somewhere between 11.00 to 1.00, and audio level 0.1V/8Ω or less	
	NOTCH OFF								
25. Neutralization trimmer adjustment	BAND 28 +0.5 SHIFT ON VFO 300 MODE SW CW SG SW ON STBY SEND Tune the DRIVE, PLATE and LOAD	Power meter Sync'ed scope	Rear panel	ANT					
	SG SW OFF							The output must be 0	
	Set the ALC to maximum with the DRIVE control. Increase oscilloscope sensitivity.					Neutralization trimmer TC1	Minimum		
	Reduce oscilloscope sensitivity (5V/div.). SG SW ON							The normal power must be obtained The signal waveform must be normal	
26. Side tone, semi-break-in function adjustment	Connect a power meter to the ANT terminal. Plug key into the rear Key jack to transmit in any band.	Oscilloscope AF VTVM	Rear panel	EXT SP	AF	VR1	0.63V/8Ω		
	Operate the key							The power must be intermittant	
	STBY REC VOX ON Operated the key							Semi-break-in operation should be available	
27. Transmission spurious adjustment	Ground pin 4 of connector ⑥ on the AF unit. Set the BAND switch to 18, and VFO to 125. Connect a power meter to the ANT terminal. Set the STBY switch to SEND and tune up.	Spectrum analyzer (receive 17.66MHz with a monitor receiver.)	Rear panel	ANT	RF	VR2	Minimum (Monitor level)	Less than −40 dB	
	STBY REC								
28. RF meter adjustment	BAND 14 VFO 175 METER RF Connect a power meter to the ANT terminal. Tune up.				Rear panel	RF VOLT	Set the IP meter reading to 250.		
	STBY REC								
29. Carrier suppression adjustment	BAND 14 VFO 175 MODE CW Connect power meter to ANT. STBY SEND Tune up. MODE USB	Sync'ro scope	Rear panel	ANT	IF	VR4 TC3	Adjust alternately until the minimum point is obtained		
	MODE LSB ↕ USB						Adjust until no level difference exists between LSB and USB.		

ADJUSTMENTS

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
	MODE CW Sync'ed scope level calibration								
	MODE USB, LSB							Less than −50 dB	Compare with CW
	STBY REC								
30. SSB frequency response adjustment	BAND 14 VFO 175 MODE USB Connect the AG (1500Hz, 7mV) to the MIC input connector. STBY SEND Tune up. Set to 50W with MIC GAIN control.	Power meter Sync'ed scope	Rear panel	ANT					
	AG 300Hz ↕ 2700Hz				PLL	TC3	Adjust until the same level is obtained for both 300 Hz and 2700Hz (equal audio rolloff).		
	MODE LSB same as above					TC2			
	AG 400Hz AG 2600 Hz							More than 1/2 with respect to the 1500Hz signal level observed on the scope.	
	After completing the above adjustment, readjust the carrier suppression (see item 29.)				IF	VR4 TC3	Minimum	Less than −50dB	
31. ALC adjustment	BAND 14, VFO 175 MIC GAIN MIN METER ALC Connect power meter to the ANT terminal. STBY SEND				(When misaligned.) IF	VR6	Set to the deflection start point.	The ALC meter must be aligned to its exact zero point.	
	Connect an AG output (1.5 kHz, 5 mV) to the MIC jack. Set the MIC GAIN control to maximum. Tune up. Reduce the power by 5 watts with the MIC GAIN control.							No ALC deflection	
	Increase the AG output to 10 mV.				IF	VR7	Obtain the maximum ALC on-scale reading.		
	Repeat the above three adjustment steps several times.								
32. Speech processor adjustment	SG SW OFF MODE USB METER COMP MIC GAIN MIN PROC ON Connect the AG output (1.5 kHz, 5 mV) to the MIC jack. Set the STBY switch to SEND. Adjust the COMP LEVEL control until the meter reading is obtained.				IF	L26	Max. meter reading		
	Set VR5 on the IF unit fully clockwise. Adjust the COMP LEVEL control until the meter indicates S-1. Set the AG output to 50 mV.					VR5	Meter indicator 20 dB		
	METER ALC Adjust the MIC GAIN control until the maximum meter reading is obtained.					L27	Max. meter reading		