

KENWOOD

HF TRANSCEIVER

TS-830S

ALIGNMENT INSTRUCTIONS

TRIO-KENWOOD CORPORATION



TEST EQUIPMENT REQUIRED**1. VTVM or DVM**

- 1) Input resistance: More than 1 M Ω
- 2) Voltage range: 1.5 to 1000V AC/DC

NOTE:

A high-precision voltmeter may be used.
However, accurate readings can not be obtained for high-impedance circuits.

2. RF VTVM

- 1) Input impedance: 1 M Ω and less than 3 pF
- 2) Voltage range: 10 mV to 300V
- 3) Frequency range: 50 MHz or greater

3. AF VTVM

- 1) Frequency range: 50 Hz to 10 kHz
- 2) Input impedance: 1 M Ω or greater
- 3) Voltage range: 10 mV to 30V

4. AF GENERATOR (AG)

- 1) Frequency range: 200 Hz to 5 kHz
- 2) Output: 2 mV $\sim$ 1V, low distortion

5. AF DUMMY LOAD

- 1) Impedance: 8 Ω
- 2) Dissipation: 3W or greater

6. RF DUMMY LOAD (POWER METER)

- 1) Impedance: 50 Ω
- 2) Dissipation: 100W continuous or greater
- 3) Frequency limits: 1.8 to 30 MHz

7. OSCILLOSCOPE

Requires high sensitivity and external synchronization capability.

8. SWEEP GENERATOR

- 1) Center frequency: 8 to 40 MHz
- 2) Sweep bandwidth: Maximum ± 16 MHz
- 3) Output voltage: More than 0.1V

9. STANDARD SIGNAL GENERATOR (SSG)

- 1) Frequency range: 1.8 to 30 MHz
- 2) Output: -20 dB/0.1 μ V $\sim$ 120 dB/1V
- 3) Output Z= 50 Ω

Generator must be frequency stable.

10. FREQUENCY COUNTER

- 1) Minimum input voltage: 50 mV
- 2) Frequency range: Greater than 50 MHz

11. NOISE GENERATOR

Must generate ignition-like noise containing harmonics beyond 30 MHz.

12. Spectrum analyzer

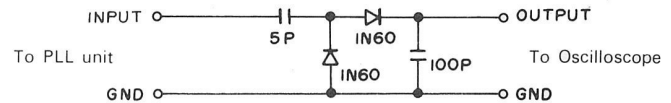
- 1) Frequency range: 100 kHz to 110 MHz
- 2) Bandwidth: 1 kHz to 3 MHz

NOTE:

R-1000 receiver may be used.

13. Detector

For adjustment of PLL unit BPF.

**14. Directional coupler****15. 8P DIN connector**

Refer to Fig. 11 on page 41.

16. FIX-CH Adjusting crystal element

- 1) 5.750 MHz (center 250 kHz)

PREPARATION

Unless otherwise specified, set the controls as follows.

Rear panel

SG SW OFF

Front panel

MODE	TUNE	TONE	MAX
CAR	MIN	RF GAIN	MAX
VOX	OFF	PROC	OFF
METER	IP	BAND	1.5
RIT/XIT	CENTERED	DH	OFF
HEATER	OFF	MONI	OFF
FIX	OFF	RIT	OFF
RF ATT	OFF	NOTCH	OFF
XIT	OFF	VB	MAX
IF SHIFT	CENTERED	AF GAIN	MIN

TS-830S Alignment Instructions

ADJUSTMENTS

TS-830S, M

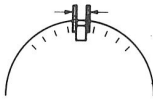
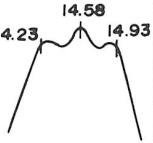
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
1. 9V AVR and 3.6V adjustment		DVM	AF	TP-6 Pin 5, connector ⑨	AF	VR4 VR3	9V 3.6V	9V±0.05V 3.6V±0.05V	RF1
2. Base current adjustment	SG SW ON MODE USB METER IP HEATER ON FIX ON DRIVE Fully clockwise BIAS VR Rotate	IP meter						Set to 60 mA	
	STBY REC. SG SW OFF								
3. Carrier adjustment ① NOTE: When making any one of the adjustments in items 3., 4., 5., or 6., observe the listed order of adjustment.	IF SHIFT VBT MODE	Centered Fully clockwise USB	RF VTVM	IF	TP3	PLL	NOTE: T16 0.3V	0.3V±1dB	NOTE: The slug of T16 should be turned counterclockwise for this adjustment after the peak point is determined.
	MODE STBY	LSB REC ↓ SEND	f. counter				VR2	Obtain the same frequency for both transmission and reception.	±20Hz
	STBY	REC					TC2	8828.50kHz	
	MODE	USB					TC3	8831.50kHz	
	MODE STBY	CW SEND					VR3	8830.70kHz	
	STBY	REC							
4. IF SHIFT check	MODE VBT	LSB Fully clockwise Rotate the IF SHIFT and check the variation	f. counter	IF	TP3			Set IF SHIFT to center. More than + 1.1 kHz Less than - 1.1 kHz	
	MODE USB:	Same as above							
	STBY SEND							8831.50 kHz	USB
	Regardless of the IF SHIFT setting							8828.50 kHz	LSB
	STBY REC								
	IF SHIFT VBT	Centered Fully counterclockwise						Reference the above frequency Less than - 1.1 kHz	USB, LSB
5. VBT adjustment and check	VBT	Fully clockwise	RF VTVM	IF	TP1	IF	NOTE: L16 1.0V	1.0V±1dB	NOTE: The slug of L16 should be turned counterclockwise for this adjustment after the peak point is determined.
			F. counter				TC2	8375.00kHz	
	VBT Fully counterclockwise							Reference the above frequency Less than - 2.4 kHz	
	STBY SEND Regardless of VBT setting							Reference the above frequency Less than ± 70 Hz	
	STBY REC								

ADJUSTMENTS

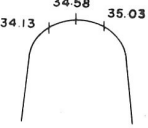
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
6. Carrier adjustment: 2	IF SHIFT VBT MODE	Centered Fully clockwise USB	RF VTVM	IF	IF	L19 L20	Max. level		
						NOTE: L20			NOTE: The slug of L20 should be adjusted while it is turned counterclockwise
	MODE LSB							0.3V ± 1 dB	If the voltage is outside the specified limit, adjust L19 and L20 until the voltage is 0.3V for both USB and LSB.
	MODE USB	F.counter						456.5 kHz	Reference value
	MODE LSB							453.5 kHz	
	MODE CW							455.7 kHz	
	STBY SEND								
	STBY REC								
7. VFO, RIT, FIX CH check and adjustment	Scale: 0 ~ 500							Should rotate smoothly and have no abnormal noise.	
	Rear panel VFO	SG SW OFF 250	RF VTVM	PLL	Pin 2, connector (5) 1P (GND)	When the voltage is outside specification		200mV ± 1 dB	
	MODE STBY	CW SEND	F.counter	Rear panel	EXT VFO 1P 7P (GND)	VFO TC2	200 mV	800 Hz UP	CW SHIFT
	Set the VFO dial to 50. At this time set the CAL control to the index.		F.counter	Rear panel	EXT VFO	VFO L3		5550.00 kHz ± 200 Hz	Repeat the adjustment several times until the frequency is within specification.
	Set the VFO dial to approx. 450. Set the CAL control dial calibrated under this VFO setting exactly to the index.				1P 7P (GND)	TC1		5950.00 kHz ± 200 Hz	
	Tune in 5550.00 kHz with the main tuning knob.							The 50 kHz point on the dial scale must be aligned to the index.	
	Under the above condition, set the CAL control to the index. Turn the main tuning, and set the calibrated CAL control to the index in the order of 0, 100, 200, 300, 400, and 500 to check frequency deviation at each 100 kHz point.					0 100 200 300 400 500	5.5 MHz 5.6 5.7 5.8 5.9 6.0	Within ± 2 kHz	Check the scale (Electrically)
	Set the CAL control back to 250 under the above condition (do not turn excessively.), then further set back the CAL control to 0 with respect to the frequency at 250 to check the difference from the reference frequency.							Less than 400Hz	Backlash

ADJUSTMENTS

TS-830S, M

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
	Set point 0 on the dial scale and the CAL control to the index. When the CAL control calibrated at each 100 kHz is set at the index, check the deviation of the dial scale at each point.							Should come in contact with the pointer.	Check the scale (mechanically)
	RIT: Centered RIT switch: ON Set the VFO main control to 5750.000 kHz				AF	VR2	5750.000 kHz		
	Check that the same frequency is obtained when the RIT switch is turned ON and OFF.							Less than 50 Hz	
	RIT switch: ON VFO: 250 RIT control: fully counter-clockwise (⊖ position) RIT control: fully clockwise (⊕ position)							− 1.5kHz or less + 1.5kHz or more Reference to the center (ϕ) position of the RIT control.	
	RIT OFF								
	Install the 5750 kHz quartz crystal into the socket on the PLL unit.				PLL	TC4	Centered	Normal oscillation must be obtained.	
							TC 4 Variable	Variable range: ±250 Hz	
	FIX ON	RF VTVM					Centered	Output level 0.2V±2 dB	
	Remove the quartz crystal from its socket. FIX OFF								
8. Counter reference oscillator adjustment		F.counter	PLL	TP2	PLL	TC1	1000.000 kHz		
9. VCO adjustment and check	Check the frequencies at the following points and adjust coils until those given in brackets are obtained.	F.counter DVM	RF(PLL) PLL	TP3(D40) TP1	Adjusting point				
					PLL	T2			
	Check the level at each of the above points.	RF VTVM	RF	TP3				1V ⁺³ ₋₂ dB	
	Both edges of the VFO frequency in each band							Display should indicate.	
10. BPF-A	Disconnect connectors ① and ⑤ on the PLL unit. Connect the cathode of D24 (1S1555) to the jumper wire next to R44 with a clip lead. Connect the sweep generator RF output to the EXT-VFO connector.	Sweep generator, Oscilloscope	PLL	Q35 ⑤	PLL	T13 T14 T15	Adjust until the response shown to the right is obtained.		

ADJUSTMENTS

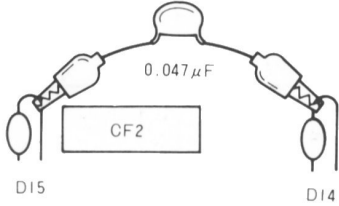
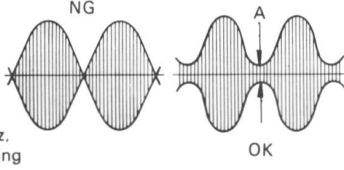
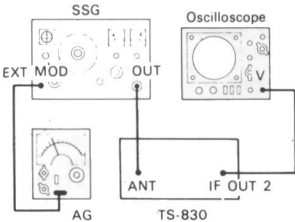
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
11. BPF-B adjustment	Disconnect connectors 1 and 5 on the PLL unit. Connect the cathode of D27 (1S1555) to the jumper wire next to R44 with a clip lead. Connect the cathode of D50 (1S1587) 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 (E)	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			

ADJUSTMENTS

TS-830S, M

Item	Condition				Measurement			Adjustment			Specification	Remarks							
					Test equipment	Unit	Terminal	Unit	Parts	Method									
	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 "O" adjustment	METER STBY	ALC SEND						IF	VR6	ALC meter starting point									
18. Generator, Drive coil adjustment	CAL	ON						RF	DRIVE coil	Max. ALC meter reading									
	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.																		
	BAND		VFO																
	1.5		400																
	3.5		250																
	7		150																
	(10)		(125)																
	14		175																
(18)		(125)																	
21		225																	
(24.5)		(450)																	
28.5		300																	
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 Connect the SSG (14.174 MHz, 8dB) to the ANT terminal				Oscilloscope AF VTVM	Rear panel	EXT. SP			Adjust the DRIVE control for maximum AF output.									

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 counterclockwise 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 its 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 0.047 μ F 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 μ F 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 μ F 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.	SSG, AG, Oscilloscope	Rear panel		IF OUT 2	IF	TC2	Adjust TC2 until part A becomes null.	
	MODE: CW.W								
	Filter SW terminal: CW1								
									 $f = 1.2 \text{ kHz}$ Level: Level for max. AM modulation.

ADJUSTMENTS

TS-830S, M

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/8!.		
	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/8! 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'd scope	Rear panel	ANT					
	SG SW OFF							The output must be 0.	
	Set the ALC to maximum with the DRIVE control. Increase oscilloscope sensitivity.					Neutrazation 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/8!.		
	Operate the key							The power must be intermittent.	
	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		
30. SSB frequency response adjustment	MODE CW Sync'ed scope level calibration								
	MODE USB, LSB							Less than - 50 dB	Compare with CW
	STBY REC								
	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).		
31. ALC adjustment	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	
	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	
32. Speech processor adjustment	Increase the AG output to 10 mV.				IF	VR7	Obtain the maximum ALC on-scale reading.		
	Repeat the above three adjustment steps several times.								
	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		

ADJUSTMENTS

TS-830S, M

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Ter- minal	Unit	Parts	Method		
	Set the PROC to OFF and the COMP LEVEL control to maximum. Set the AG output to 10 mV. Adjust the MIC GAIN control until the meter indicates the maximum on-scale ALC reading. Set the PROC to ON.					L27	Adjust until the same meter reading is obtained (MAX ALC on-scale).	MIC input providing the same ALC meter reading: 10mV±3 dB	NOTE: L27 should be adjusted while it is turned counterclockwise.
	STBY REC								
33. Monitor level adjustment	BAND 14 VFO 175 AGC FAST CAL ON Set the marker level to 0.63V with the AF GAIN control.	Oscilloscope	Rear panel	EXT. SP					
	Connect a power meter to the ANT terminal. SG SW ON STBY SEND Tune up MODE USB Connect the AG (1 kHz, 10 mV) to the MIC jack. METER ALC Deflect ALC meter by MIC GAIN control. MONI ON				IF	VR8	Monitor output 0.63V/8Ω.		
	Disconnect AG. AF GAIN MAX.							Less than 8mV/8Ω	Monitor hum
	MONI OFF, STBY REC								

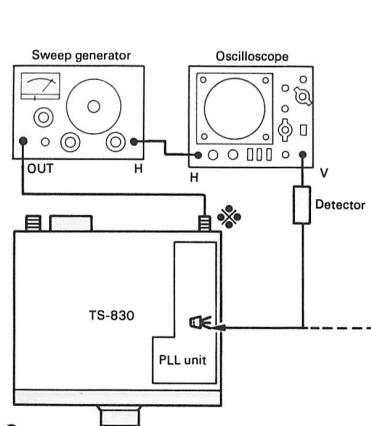


Fig. 9
(10) BPF-A, (11) BPF-B, (12) BPF-C
(13) VFO MIX SPURIOUS

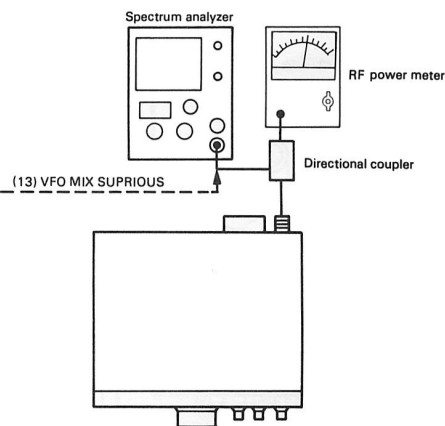
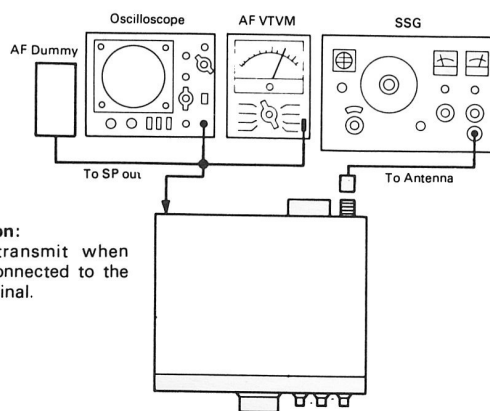


Fig. 10 (27) TX SPURIOUS



☆ Caution:
NEVER transmit when
SSG is connected to the
ANT terminal.

Fig. 12 (15) IF AMP, (16) COIL PACK, (20) IF TRAP,

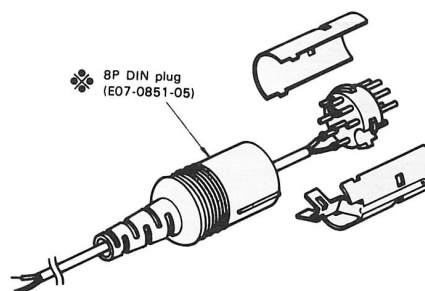
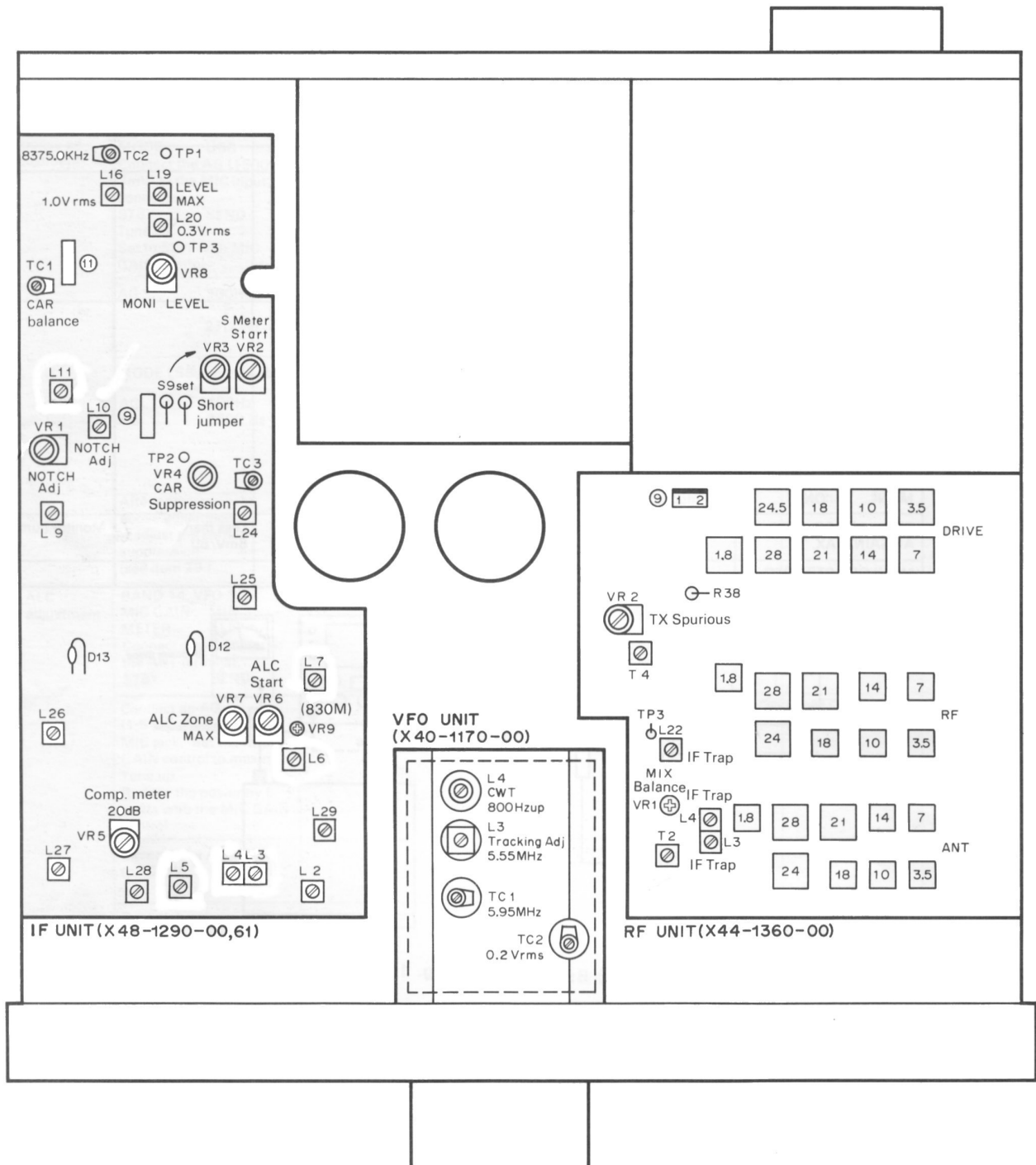


Fig. 11 8P DIN connector

LOCATION OF ADJUSTMENTS

▼ TOP VIEW



TS-830S, M

The diagram illustrates the internal components and connections of the PLL UNIT (X50-1680-00). The unit is shown as a large rectangle with various components labeled inside and outside.

Internal Components:

- VFO MIX spurious:** A component at the top right.
- VR1:** A variable resistor connected to the VFO MIX spurious component.
- TC4:** A component connected to the VFO MIX spurious component.
- VR3:** A variable resistor connected to the VFO MIX spurious component.
- TC3:** A component connected to the VFO MIX spurious component.
- TC2:** A component connected to the VFO MIX spurious component.
- VR2:** A variable resistor connected to the VFO MIX spurious component.
- T15:** A component connected to the VFO MIX spurious component.
- T16:** A component connected to the VFO MIX spurious component.
- T14:** A component connected to the VFO MIX spurious component.
- T13:** A component connected to the VFO MIX spurious component.
- T17:** A component connected to the VFO MIX spurious component.
- T18:** A component connected to the VFO MIX spurious component.
- D50:** A component connected to the VFO MIX spurious component.
- R11:** A component connected to the VFO MIX spurious component.
- T12:** A component connected to the VFO MIX spurious component.
- T9:** A component connected to the VFO MIX spurious component.
- T11:** A component connected to the VFO MIX spurious component.
- T8:** A component connected to the VFO MIX spurious component.
- T10:** A component connected to the VFO MIX spurious component.
- T7:** A component connected to the VFO MIX spurious component.
- Short jumper:** A component connected to the VFO MIX spurious component.
- Q35:** A component connected to the VFO MIX spurious component.
- TC1:** A component connected to the VFO MIX spurious component.
- STD f 1MHz Adj:** A component connected to the VFO MIX spurious component.
- R44:** A component connected to the VFO MIX spurious component.
- TP2:** A component connected to the VFO MIX spurious component.
- Short jumper:** A component connected to the VFO MIX spurious component.

External Connections:

- AF UNIT (X49-1140-00):** Connected to the PLL UNIT via a cable labeled "Neutralization".
- PLL UNIT (X50-1680-00):** The main unit being diagrammed.

Model TS-830S

Serial No. _____

Date of Purchase / / _____

Dealer _____

A product of
TRIO-KENWOOD CORPORATION
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