For those operators who desire a Patch input similar to the TS-520S or TS-820S, an input connection and terminal must be added at the Mic input preamp circuit.

Use a 100 kΩ resistor in series, with a 10 kΩ to ground on the input side of the 100 kΩ resistor. Use shielded line, and connect as follows:

On the IF unit X48-1290-00 install the fixed divider at the junction of R111 10 kΩ, C103, 100 pF and C104 1 μF (input of Q19). Add an RCA jack at one of the predrilled hole on the rear panel for input.

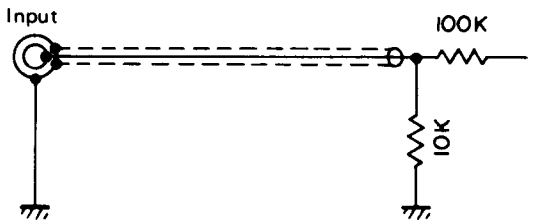


Fig. 5-5 **Optional Special Phone Patch Input.**

■ EXTENSION FEET

The TS-830S is provided with two extension feet which can be used to elevate the front panel. In some operating positions the tilt makes it easier to read the dial and meter. Fig. 5-6 shows how to install the feet.

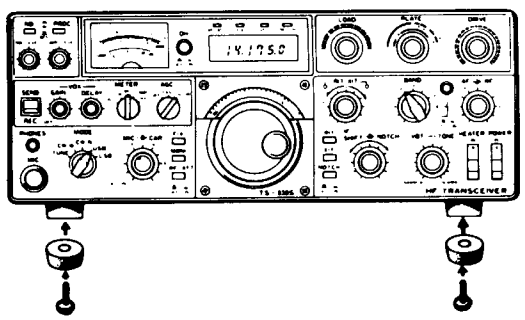
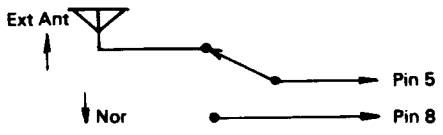


Fig. 5-6 Attaching the Extension Feet

■ OPERATION WITH A SEPERATE RECEIVER ANTENNA

Use the XVRTR port and an 8 Pin DIN Plug, Part E07-0851-05

Pin 8 HF Ant output from the TS-830S
Pin 5 RX Ant input
Pin 3 GND



Either wire your extra antenna to pin 5 and ground, and use the DIN plug as the connect/disconnect, or wire pins 8 and 5 and the external antenna through a SPDT switch, as shown.

■ OPERATION WITH A SECOND RECEIVER

Use the XVRTR port and an 8 Pin DIN Plug, Part E07-0851-05.

Pin 8 HF Ant output from the TS-830S
Pin 5 RX Ant input
Pin 3 GND
Pin 2 RL control, 12V DC in TX

Connect pins 8 and 5 together and through a short length of 50Ω coax to your second receiver Ant input.
Use pin 2 to mute the second receiver in TX.

■ OPERATION AS A SECOND RECEIVER

Use the Remote Connector. Connect Pin 3 (PTT line) to your XMTR control output, to ground Pin 3 in TX. Connector metal shell to Ground. Feed the antenna through the primary XCVR/XMTR Relay.

■ OPERATION WITH THE SM-220 SCOPE AND BS-8 PAN DISPLAY

No modifications or wire changes are required. Cable as follows:

TS-830S to SM-220
IF#1 Rear panel IF Input
IF#2 Verticle Input

SECTION 6. MAINTENANCE AND ALIGNMENT

CAUTION:
DANGEROUS HIGH VOLTAGES ARE PRESENT WITHIN THE CASE OF THE TS-830S WHEN THE TRANSCEIVER IS TURNED ON.
EXERCISE EXTREME CAUTION TO AVOID ELECTRIC SHOCK.

6.1 GENERAL

Your TS-830S has been factory aligned and tested to specification before shipment. Under normal circumstances the transceiver will operate in accordance with these operating instructions. All adjustable trimmers and coils in your transceiver were preset at the factory and should only be readjusted by a qualified technician with proper test equipment.
Attempting service or alignment without factory authorization can void the transceivers warranty.

■ CLEANING

The knobs, front panel and cabinet of the TS-830S are likely to become soiled after extended use. The knobs should be removed from the transceiver and cleaned with a neutral soap and warm water. Use a neutral soap (not harsh chemicals) and a damp cloth to clean the cabinet and front panel.

■ FUSE REPLACEMENT

When the fuse blows, there is some cause. Be sure to find the cause before attempting operation. Use a 6 amp fuse for 120V AC operation. Under no circumstances use a higher amperage fuse than specified. This can cause extensive damage. Also, the warranty will be void if an oversized fuse is used.

■ FAN MOTOR LUBRICATION

Every 6 months dust out the final compartment, and apply a few drops of light machine oil to the front and rear fan motor bearings.

WARNING:
Be certain to disconnect power, and to discharge high voltage before servicing in the final compartment.

6.2 SERVICE POSITION

The TS-830S should be placed on its side, with the final section up, for any alignment or service. This position permits adequate ventilation for the final tubes as well as easy accessibility to the modules. Most of the described adjustments can be made without removing the boards from the transceiver.

6.3 RECEIVER ADJUSTMENTS

■ RIT ZERO (AF-AVR UNIT)

When the RIT circuit is turned on, and the RIT control is set to zero, the receive frequency should be exactly the same as the transmit frequency. If the frequency is not the same, adjust the RIT zero preset control, VR2.

To zero the RIT, turn on the calibrator and tune the VFO for about a 1000 Hz calibrator tone. Turn the RIT control to zero. Turn the RIT switch ON and adjust VR2 for the same 1000 Hz tone. Push the RIT switch ON and OFF to be sure the tones are identical.

■ NOTCH ADJUSTMENT (IF UNIT)

Turn the NOTCH switch OFF and center the NOTCH control.
trol.
Receive a 25 kHz marker signal at 1.9 MHz with a 1.5 kHz beat frequency.
Turn the NOTCH switch ON.
While monitoring AF output through the speaker, adjust L10 and VR1 alternately to minimize this signal.

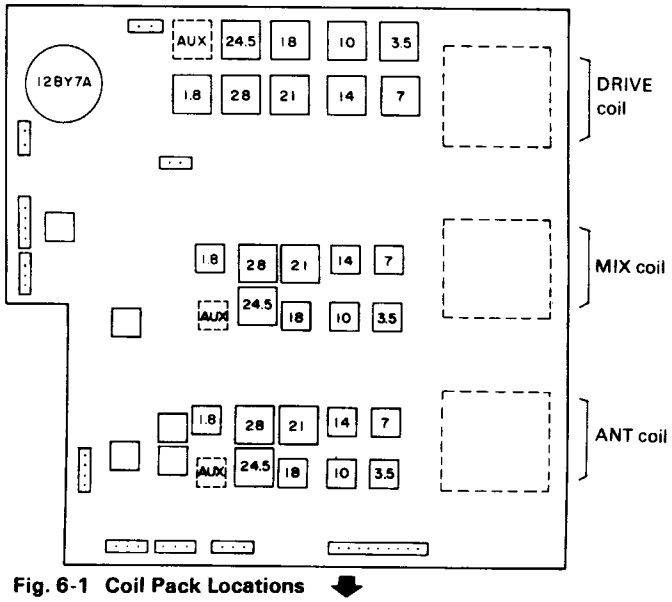


Fig. 6-1 Coil Pack Locations

BAND Switch	adjustment Frequency
1.5	1.9 MHz
3.5	3.75
7	7.15
10	10.125
14	14.175
18	18.125
21	21.225
24.5	24.95
28.5	28.8

Table 6-1 Coil pack Alignment order

■ ADJUSTMENT OF ANT AND MIX COILS (COIL PACK UNIT)

The ANT and MIX coils are included in the coil pack unit. Use the 25 kHz calibrator as a signal. Connect a 50Ω dummy load to terminate the receiver input. Set the DRIVE control to 12 o'clock. Adjust the ANT and MIX coils for maximum S meter deflection, following the frequency table. Start with the 1.8 MHz band and then proceed to the other bands. To adjust the 10m band, use only 28.8 MHz in the 28.5 MHz band.

■ ADJUSTMENT OF RECEIVE IF COILS (RF AND IF UNITS)

Receive a marker signal using any frequency. Adjust the DRIVE and the main tuning for maximum S meter deflection. Adjust T2 on the RF unit and L3, L4, L5, L6, L7, L11 and L12 on the IF unit for maximum S meter indication. DO NOT adjust L9.

■ S METER ADJUSTMENT (IF UNIT)

Disconnect the antenna with the transceiver in receive mode. Zero-point adjustment:

Adjust VR2 for meter pointer zero indication. If a standard signal generator (SSG) is available, adjust VR3 so the S-meter indicates "S-9", at 14.175 MHz for A 40 dB (50 μV) signal.

6.4 TRANSMITTER ADJUSTMENTS

■ TRANSMITTER NEUTRALIZATION

(See Internal View Bottom)

The TS-830S requires neutralization every time the final tubes are changed.

Tune up the TS-830S into a 50 ohm dummy load at 28.5 MHz for CW operation as described in Section 4. Set the SG switch to OFF and place a sensitive RF milli-voltmeter across the dummy load. Flip the stand-by switch to SEND and adjust TC1 (at the bottom of the final section) for a minimum reading on the voltmeter. After the final section is neutralized, flip the stand-by switch to REC and slide the SG switch ON.

A receiver tuned to 28.5 MHz works very well for neutralizing if an RF voltmeter is not available. Instead of tuning for a minimum voltage, tune for a minimum S-meter reading.

NOTE:

Since the drive tube operates into a fixed load (the finals) it is not always necessary to replace this tube when replacing the finals.

CAUTION:

Neutralization of the final section should be carried out with the chassis shield in place. Dangerous high voltages are present in the final section when the transceiver is turned on. Use an insulated tool to make this adjustment.

■ TRANSMIT DRIVE COIL ADJUSTMENT (RF UNIT)

The drive coils are part of the coil pack unit. Set the SG switch on the rear panel to OFF and center the DRIVE control (12 o'clock). Set the METER switch to ALC and the MODE switch to CW.W, CW.N or TUN.

With the standby switch in the SEND position, adjust the drive coils for maximum ALC deflection for each band using the same frequency and in the same order as for adjustment of the ANT and MIX coils.

During adjustment, adjust the CAR control so there is just enough injection to swing the ALC meter.

■ TRANSMIT IF COIL ADJUSTMENT (IF AND RF UNITS)

Using any frequency, place the transceiver in transmit mode in the CW.N, CW.W or TUN position. Adjust L28, 29 on the IF unit and T4 on the RF unit for maximum ALC deflection.

■ CARRIER BALANCE ADJUSTMENT (IF UNIT)

With a 50Ω dummy load connected to the ANT terminal, adjust for maximum output at 14.175 MHz. Reduce mic gain to zero. Set the transceiver in LSB mode and adjust the RF METER control on the rear panel for maximum sensitivity. The RF meter will deflect if the carrier is unbalanced. To balance the carrier, alternately adjust trimmer TC3 and trimpot VR4 until the meter indicates minimum. Switch to USB mode and if the pointer deflects, read just so the pointer deflects equally for both LSB and USB.

■ ADJUSTMENT OF SIDE TONE LEVEL (AF-AVR UNIT)

Adjust VR1 to your preference.

■ ADJUSTMENT OF MONITOR LEVEL (IF UNIT)

Adjust VR8 to your preference.

6.5 TRANSMITTING ON WARC BANDS

As supplied, the TS-830S will receive but not transmit on the 17, and 12 meter WARC bands. If transmit capability is desired, a minor wiring change is required.

1. For 2 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
18 MHz	D5
24.5 MHz	D6

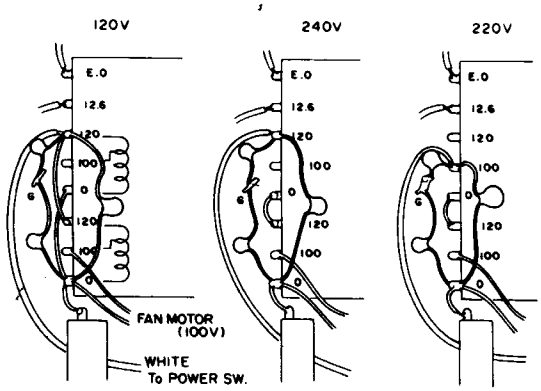
6.6 ANALOG DIAL ADJUSTMENT

1. Turn the main dial fully CCW. The red cursor should line up with the VFO start mark on the sub-dial. If it does not, remove the main knob (2mm allen), loosen and line the 12mm nut up the scale start point to the red cursor.
2. Turn the main knob to 50 kHz analog. Adjust the aluminum slip sub-dial to line up with any one of the larger black dial marks.
3. Note the digital error. If it is MORE than 2 kHz adjust the VFO trimmer cap TC1 (Front under the seal tape) to exactly 50.0 on the digital readout.
4. Turn the main knob to 450 analog. If the digital error is less than 2 kHz it is in spec. If the digital error is greater, proceed:
   For instance if the digital error is 14.454.0 (plus 4 kHz), multiply the error times 4 (16 kHz) and adjust the VFO timmer cap to the desired frequency (14.450.0) LESS the error, or 14.434.0. Next adjust the VFO inductor L3 (Center under the seal tape) back up to the desired frequency of 14.450.0.
5. If the error in step 4 was in the minus direction, reverse the direction of the correction adjustment in step 4.
6. VFO linearity final check: The digital readout and analog dial should agree to within ±2 kHz at every 100 kHz dial point.

6.7 OPERATION ON 220 OR 240V AC

To operate the TS-830S on 240V AC, the power transformer split primaries must be rewired from parallel to series connection.

1. Unplug the AC power cable.
2. Remove the bottom cover.
3. Remove the jumper wires between the two 0 terminals and two 120 terminals on the bottom of the power transformer.
4. Connect the adjacent 120 and 0 terminals at the middle of the transformer. This will provide 240V AC operation.
   For 220V AC operation, connect the adjacent 120 and 0 terminals, and move the white lead and Bypass, capacitors from the 120 terminal to the 100 terminal.
5. Change the AC fuse from 6A to 4A. Tag the power cord at the back of the radio to indicate that the transformer is strapped for 240V AC, and the power fuse should be 4A, and not 6A.
6. Replace the bottom cover and reconnect power to verify your work.



6.8 ORDERING SPARE PARTS

When ordering replacement or spare parts for your equipment, be sure to specify the following information:
Model and serial number of the equipment. Schematic number of the part. Printed circuit board number on which the part is located. Part number and name, if known, and Quantity desired.

NOTE:
A full Service Manual is available as a separate publication.

6.9 SERVICE

Should it ever become necessary to return the equipment for repair, pack in its original boxes and packing, and include a full description of the problems involved. Also include your telephone number. You need not return accessory items unless directly related to the service problem.

You may return your radio for service to the Authorized Kenwood Dealer from whom you purchased it. A copy of the service report will be returned with the unit. Please do not send sub-assemblies or printed circuit boards. Send the complete unit, in its original boxes and packing. If you want verification of receipt, please supply a self-addressed card (or letter) and you will be informed of the date of receipt and estimated service time.

SERVICE NOTE:
Dear OM, if you desire to correspond on a technical or operational problem, please make your note short, complete, and to the point. And PLEASE make it readable.
Please list: Model and serial number.
The question or problem you are having.
Please give sufficient detail to diagnose; other equipment in the station, meter readings and anything you feel might be useful in attempting diagnosis.

NOTE:
1. Record the date of purchase, serial number and dealer from whom purchased.
2. For your own information, retain a written record of any maintenance performed on the unit.
3. When claiming warranty service, please include a photocopy of the bill of sale, or other proof of purchase showing the date of sale.

SECTION 7. TROUBLESHOOTING

6.1 GENERAL

The problems described in this table are failures caused in general by improper operation or connection of the transceiver, not by defective components. There is a separate service manual for repair of the TS-830S.

TRANSMITTER SECTION

SYMPTOMS	CAUSE	REMEDY
No output (No plate current)	No voltage on the screen grid of the final tubes.	Turn the SG switch on the rear panel ON.
No output in SSB (No plate current)	1. Open microphone cable or bad microphone. 2. Low microphone gain. 3. PROC switch is set to ON with COMP LEVEL control turned fully counterclockwise.	1. Check the microphone. 2. Increase the MIC control. 3. Increase the COMP LEVEL control.
There is output, but the RF meter shows no output.	RF METER control not adjusted correctly.	Adjust control for 2/3 scale reading at full output.
VOX does not operate.	1. VOX GAIN control too low. 2. ANTI VOX control requires adjustment.	1. See section 4.4 2. See section 4.4
VOX trips by speaker output.	ANTI VOX control requires adjustment.	See section 4.4
XIT control inoperative	XIT switch is off.	Push XIT button.
Mic or radio chassis is "hot" during TX.	Excess RF in the shack. No earth ground, poor ground, or antenna is too close to the radio.	See section 2
Poor audio in SSB, TX-feedback.	Excess RF in the shack.	See section 2
RF METER reading varies by band.	SWR differences between bands	Retune antenna system.

RECEIVER SECTION

SYMPTOM	CAUSE	REMEDY
Pilot lights do not light and there is no receiver noise when the POWER switch is turned on.	1. Bad power cable or connections. 2. Blown power supply fuse.	1. Check cables and connections. 2. Check for the cause of the blown fuse and replace the fuse.
An antenna is connected but no signals are heard.	1. FIX SW is turned ON. 2. Microphone PTT switch (or stand-by switch) is in the transmit position.	1. Turn the FIX SW off. 2. Release the PTT switch.
An antenna is connected but S-meter deflects without a received signal.	1. RF GAIN control closed. 2. Low AC line voltage.	1. Open RF GAIN control. 2. Use a step-up transformer to raise the line voltage.
SSB signal unintelligible	MODE switch is set to wrong sideband.	Turn MODE switch to the correct sideband.
RIT control inoperative.	RIT switch is off.	Push RIT button.
SSB received signal is extremely high cut or low cut.	1. IF shift is out of adjustment. 2. VBT is out of adjustment. 3. TONE control is out of adjustment.	1. Set to the center (click) position. 2. Set to the NORMAL position. 3. Set to the center position.