

(6) IF SHIFT

By using the IF SHIFT during reception, the crystal filter passband frequency can be shifted approximately ± 1.2 kHz. This is achieved by use of a PLL (Phase-Locked Loop) in the L.O. (local oscillator) circuit. This is a major feature of the TS-830S and can be used in the following cases:

1. Adjustment of tone quality and interference rejection during SSB Reception.

When the transceiver is on 20 meters and above, USB mode, turn the IF SHIFT in the "+" direction and the lower frequencies are attenuated. Turning the knob in the "-" direction cuts the higher frequencies. (These procedures are reversed for LSB operation below 20 meters). Adjust the control to your listening preference. The IF SHIFT is also effective in eliminating interference from adjacent receive signals.

2. Adjustment of tone quality during CW operation.

For a detailed description, refer to Section 4.4. "CW" operation".

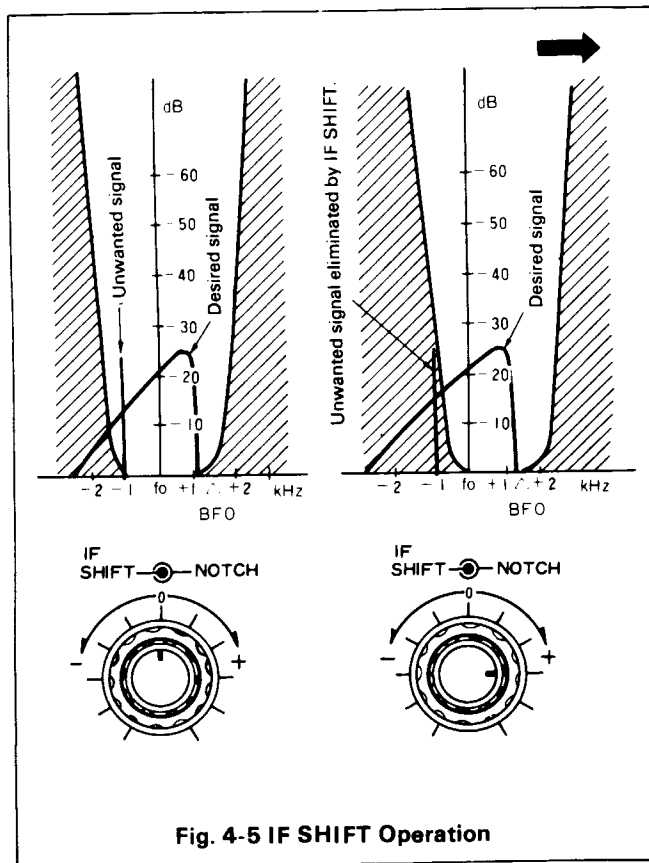


Fig. 4-5 IF SHIFT Operation

(7) VBT AND IF SHIFT IN COMBINATION

If excessive radio interference is encountered during SSB operation, adjust the VBT for optimum bandwidth, and the IF SHIFT for maximum intelligibility.

In CW mode, first adjust the VBT. Turn the IF SHIFT "-" (counter clockwise), adjusting for approximately 800 Hz tone. If pitch lower than 800 Hz is desired, adjust the RIT and IF SHIFT.

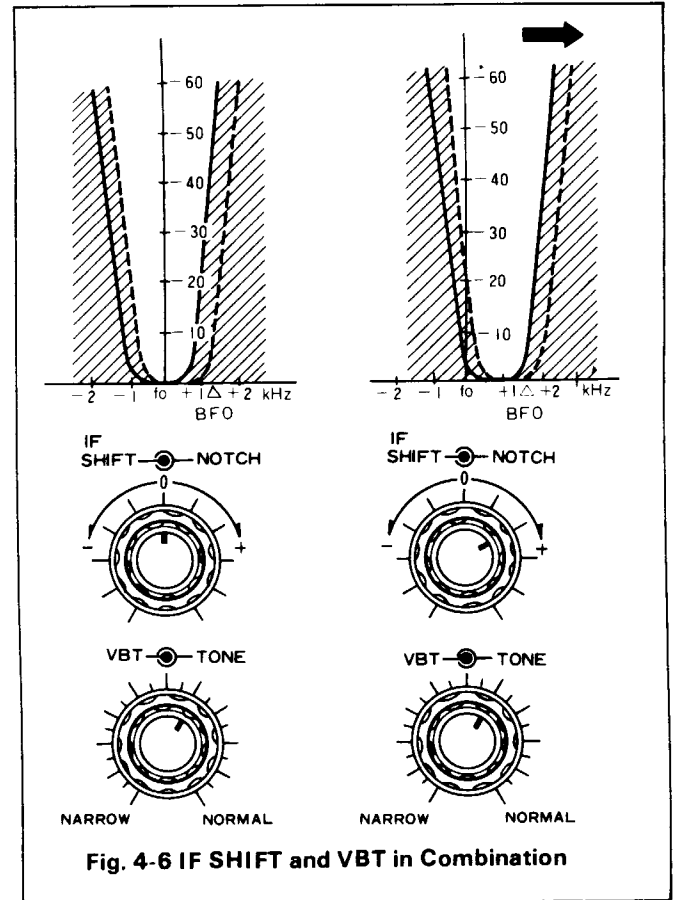


Fig. 4-6 IF SHIFT and VBT in Combination

(8) NOTCH CONTROL

If a single tone such as a CW signal is superimposed on the receive signal, turn the NOTCH ON and adjust the NOTCH control to eliminate or minimize the beat signal. A beat of approximately 1.5 kHz can be eliminated at the center position of the control. In USB or CW mode, a beat signal lower than 1.5 kHz can be eliminated by turning the control clockwise. In LSB mode, adjust the control counterclockwise.

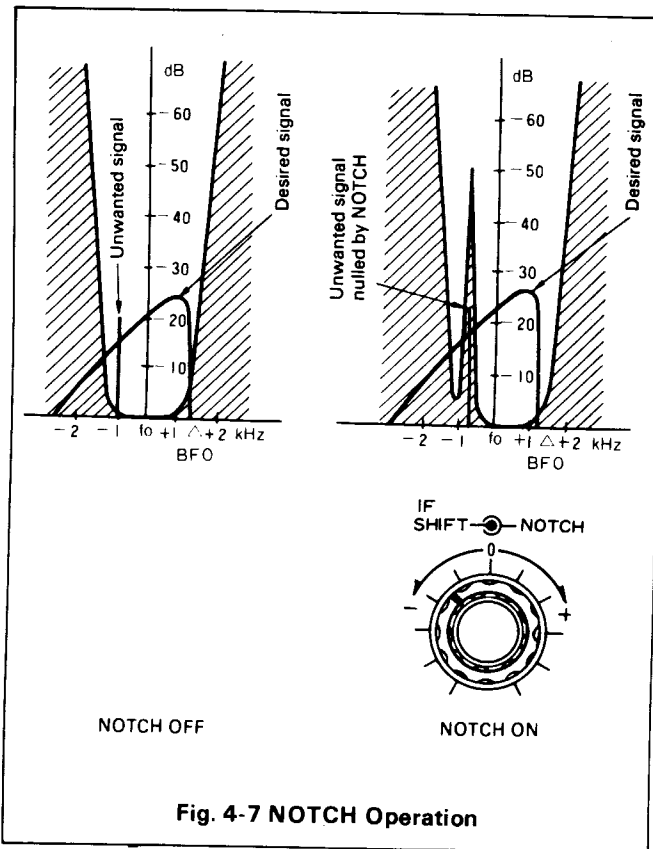


Fig. 4-7 NOTCH Operation

(9) NOISE BLANKER (NB)

For pulse type noise, such as generated by automotive ignition systems, turn the NB switch ON. Adjusting the NB LEVEL control varies the blanker's threshold, eliminating even low level noises.

NOTE:

If high level signal or noise is present on an adjacent frequency, do not use excessive NB threshold LEVEL as it may distort the received signal. If you are operating near other strong signals, use the RF ATT along with the noise blanker level control.

(10) TONE CONTROL

Adjust this control to obtain desired tone quality.

4.3 TRANSMISSION (I)

This section covers adjustment of the transceiver for transmission.

Refer to Fig. 4-1 for initial transmitter switch settings. Set the main tuning to the desired operating frequency. (Refer to Table 4-1 for a summary of the following.)

CAUTION:

DO NOT turn the BANDSWITCH while the transceiver is in transmit mode.

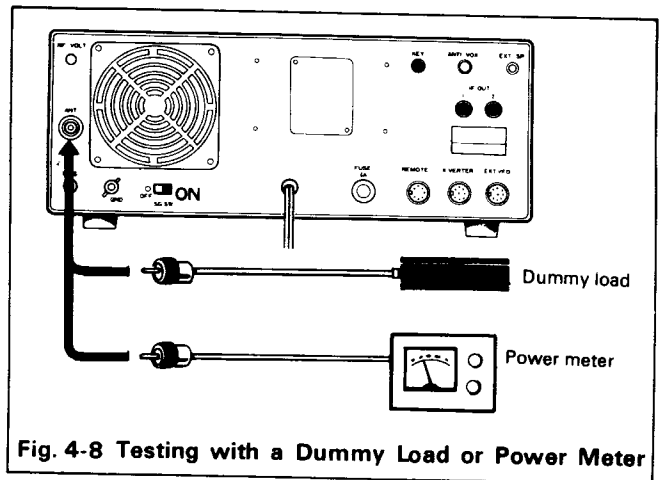


Fig. 4-8 Testing with a Dummy Load or Power Meter

1. Connect a 50Ω antenna for the band you will operate or a dummy load, and connect a key. SWR must be 2:1 or better. The life of the final tubes is directly related to the SWR of the antenna, and to the length of tuning periods.
2. Turn POWER and HEATER ON.
3. Place the MODE switch to SSB, METER switch to Ip.
4. Place the STAND-BY switch to SEND and adjust bias to 60 mA with the BIAS control on the rear panel.

CAUTION:

If the plate current is higher than 60 mA do not leave the stand-by switch on for more than a few seconds. Excessive plate current shortens the life of the final tubes.

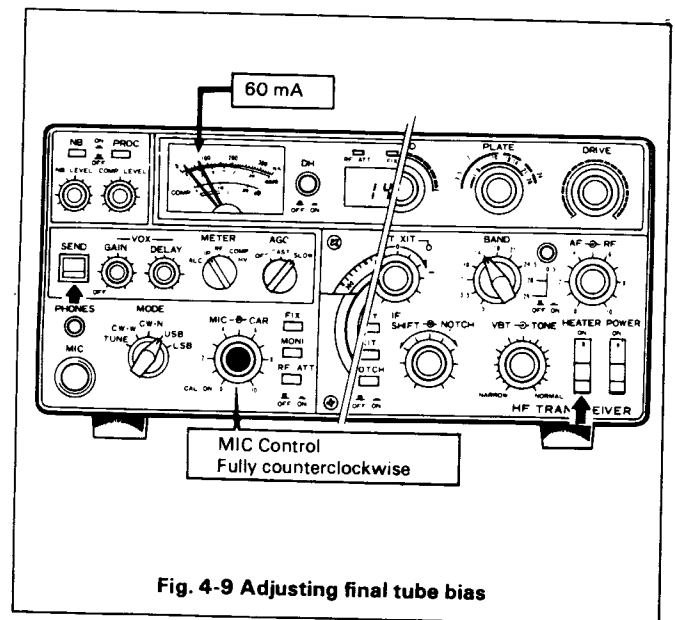


Fig. 4-9 Adjusting final tube bias

- Place MODE switch to TUNE, METER switch to ALC. Peak the DRIVE control. If the meter pegs or goes out of the ALC range, reduce the CARRIER control setting for an on-scale reading. (the CAR control is a level adjustment, while the DRIVE control is a resonating adjustment.)

NOTE:

The TUNE position permits tuning of the final tank circuit at reduced power without danger to the tubes. In the TUNE position, the screen voltage to the finals is reduced approximately 50% and the keying circuit is closed.

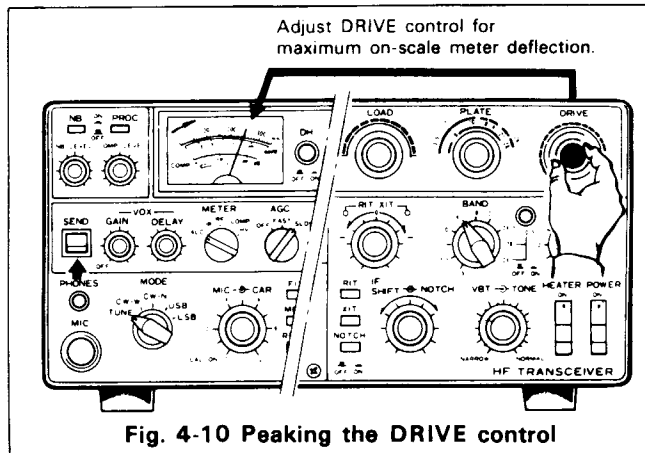


Fig. 4-10 Peaking the DRIVE control

- Place the meter switch to IP and dip the PLATE. Dip will be typically only about 5ma. (or to RF and peak the plate.)

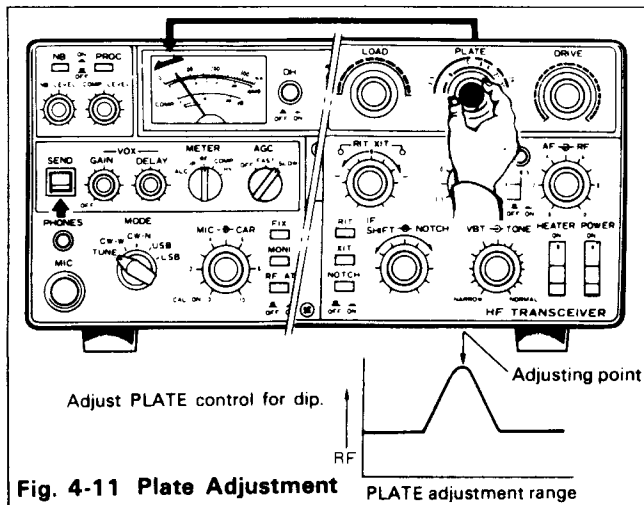


Fig. 4-11 Plate Adjustment

Table 4-1. Summary of Transmitter Tuning Procedure

MODE Switch	METER Switch	Stand-by Switch	Procedure
USB or LSB	IP	REC → SEND	Adjust BIAS control for 60 ma.
TUNE	ALC	REC → SEND	Peak the ALC reading with the DRIVE control.
TUNE	IP	REC → SEND	DIP the PLATE reading with the PLATE control.
TUNE	RF	REC → SEND	PEAK RF Reading with the load control.
CW	RF	REC → SEND	Peak RF output by alternately adjusting the PLATE and LOAD controls.

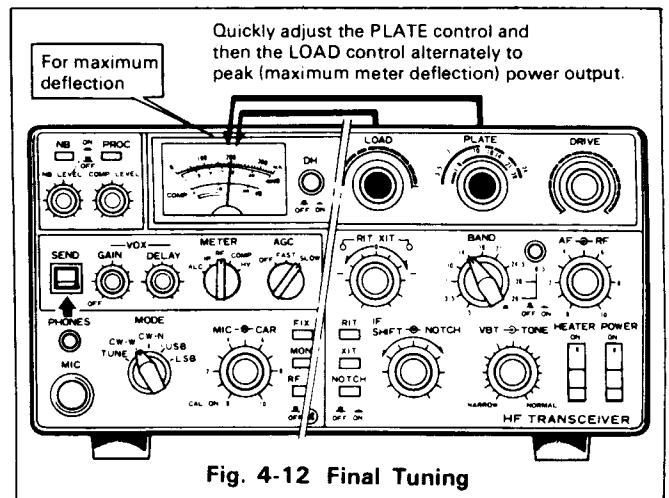


Fig. 4-12 Final Tuning

- Place the meter switch to RF and peak the LOAD control.
- Place the Mode switch to CW. Meter switch to Ip. Close the key and IMMEDIATELY redip the PLATE control. Reduce the carrier control setting if Ip reads over 265ma. Open the key.
- Place the meter switch to RF. Close the key and repeat the LOAD for maximum RF output. You may at your option also redip the PLATE for maximum RF output. Open the key. You are tuned up for CW operation. If necessary, adjust the RF METER control on the rear panel to bring the output reading to about 2/3 scale. This is a meter adjustment, not an output adjustment.

NOTE:

Dip point may not always coincide with maximum output, because neutralization is accomplished on the 10 meter band.

For this reason, you may simply adjust both the PLATE and the LOAD controls for maximum output as described in both tune-up procedure and summary Table 4-1.

(1) SSB OPERATION

Tune the TS-830S as described in steps 1 through 9. Set the MODE switch per Table 4-2, to USB or LSB and connect a microphone to the MIC input.

NOTE:

International Amateur practice dictates using USB or LSB as shown in Table 4-2.

To operate SSB, connect a microphone. (The Key and CARRIER control have no effect in SSB mode.) Place the MODE switch to SSB, METER switch to ALC. Adjust the MIC gain control for an on scale ALC reading on voice peaks. (Disregard RF and Ip meter readings in SSB- they are not accurate or relevant.)

1.8 MHz Band	LSB
3.5 MHz Band	LSB
7 MHz Band	LSB
10 MHz Band	USB
14 MHz Band	USB
18 MHz Band	USB
21 MHz Band	USB
24.5 MHz Band	USB
28 MHz Band	USB

TABLE 4-2. MODE by Band

■ PTT (Push to talk) OPERATION

By using a microphone equipped with a PTT switch, the transceiver is ready for PTT operation. To key, depress the PTT switch with the stand-by switch left in the REC position.

4.4 TRANSMISSION (II)

To obtain maximum transmitter performance from your TS-830S you should understand the proper operation of the following controls and switches.

(1) SPEECH PROCESSOR

In SSB operation (particularly DX operation), it may be desirable to increase "talk-power" by using the speech processor. This may make the difference between a marginal, and a copiable signal.

Operation

The speech processor system in the TS-830S is an RFclipper using two filters, one in the VBT circuit and the other in the IF.

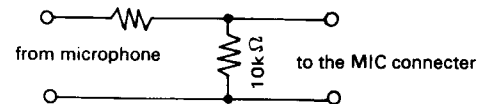
Turn the PROCESS switch ON and place the METER switch to COMP. Adjust the COMP LEVEL control while speaking into the microphone in a NORMAL tone of voice for a peak COMP scale reading of about 10-20 dB. Do not overdrive the COMPRESSOR: This will deteriorate voice quality, increase transmitter noise level, and in general make copying your signal more difficult.

Next, set the METER switch to ALC and adjust the MIC control while speaking into the microphone. Ensure that meter deflection is within the ALC zone.

NOTE:

When a high-output microphone is used, input overload and distortion will result. To prevent this, use an attenuator in the microphone circuit as shown below, or connect a 10 — 33 kΩ resistor (depending on microphone used) across the microphone input. ("Normal" mic control setting should be approximately 12 O'clock).

10k — 33 kΩ (depending on microphone used.)



The MC-50 microphone is recommended (Microphone sensitivity: -55 ± 3 dB for approx. 5 cm distance to the mic.)

(2) VOX (Voice Operated Transmit) OPERATION

Adjust the transceiver as described in the previous paragraph. Flip the VOX switch on and while speaking into the microphone, increase the VOX GAIN control until the VOX relay just operates. For VOX operation it is sometimes desirable to close-talk the microphone to prevent background noises from tripping the transmitter.

Check that the ALC reading for voice peaks is still within range on the meter. If necessary, adjust the MIC control for proper ALC reading.

If the VOX circuit is activated by speaker output, adjust the ANTI-VOX control (on the rear panel) as necessary for proper VOX operation.

Do not use excessive VOX or ANTI VOX gain more than necessary to control VOX operation. If the VOX circuit transfers between words, or holds too long, adjust the release time constant by the DELAY control.

(3) XIT

By using XIT, transmit frequency can be shifted independent of receive frequency.

With the XIT switch ON, the XIT is controlled by the RIT/XIT knob and transmit frequency can be shifted by about ± 2 kHz. When both the RIT and XIT switches are ON, both receive and transmit are shifted without adjusting the main tuning.

(4) MONITOR

To monitor transmitted SSB signal quality, turn the MONITOR switch ON to sample and demodulate a part of the transmit IF signal.

This feature is useful for checking modulation, or when adjusting the speech processor.

When monitoring, use a headphone to avoid audio feedback.

NOTE:

If the HEATER switch is OFF or the DRIVE control is incorrectly adjusted, the ALC circuit will not operate properly, causing excessively high transmit IF signal level, resulting in a distorted monitor signal.

(5) CW OPERATION (fig. 4-13)

Tune and load the TS-830S as described in Sections 4.3. Using shielded line, connect a key to the rear panel KEY jack, set the MODE switch to CW, and set the stand-by switch to SEND for transmitting.

CW transmission is automatically monitored through the transceiver's speaker. Sidetone audio gain can be adjusted through the opening in the bottom cover.

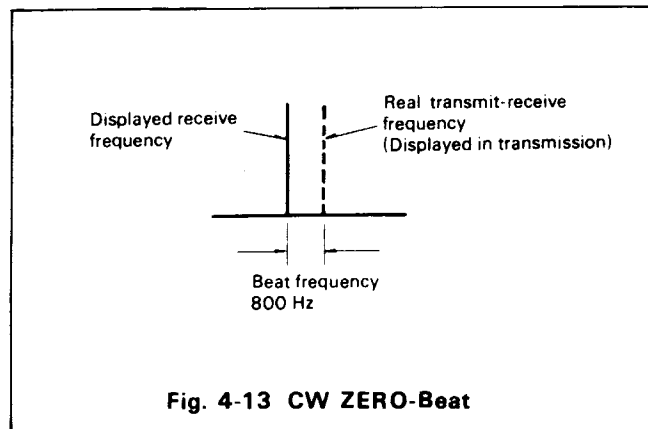


Fig. 4-13 CW ZERO-Beat

(i) Reception

The TS-830S operates in two different CW modes: WIDE and NARROW. In the WIDE mode, the SSB filter (pass bandwidth 2.4 kHz, -6 dB) and an audio filter are used.

In the NARROW mode, option CW filters (YK-88C, YK-88CN, YG-455C, YG-455CN) may be used to narrow the IF pass bandwidth to 500 Hz (-6 dB) or 250 Hz along with the audio filter. In both modes, high frequencies are cut so the received signal will be more easily copied.

■ OPERATION WITHOUT CW FILTERS

To receive CW, set the IF SHIFT control to its center position and the RIT switch to OFF. Adjust the main tuning for about an 800 Hz beat and your transmit frequency will be tuned (zeroed) to the transmit frequency of the station you are receiving. During reception, the side tone is activated by the key (VOX off). Listen to the side tone superimposed on the receive signal and adjust the main tuning for similar side tone and incoming CW audio tone. By doing so, transmit frequencies will be ZERO-bes. You may now adjust the RIT for a pitch which suits your preference. If interference is encountered, adjust the IF SHIFT. For more convenient and effective CW operation, use of the optional CW filters is recommended.

■ OPERATION WITH CW FILTERS (OPTION)

Set the IF SHIFT to its center position and the RIT OFF. Adjust the main tuning for maximum S-meter deflection. Receive signal pitch will be about 800 Hz, indicating correct tuning. For optional CW filter information, See Page 24.

■ KEY CONNECTION (Fig. 4.14)

Your key should be connected as illustrated in Fig. 4-14. When using an electronic keyer, make sure that polarity is correct. Use shielded line from the key to transceiver.

NOTE:

When using an electronic keyer, set polarity of the keyer for NEGATIVE keying.

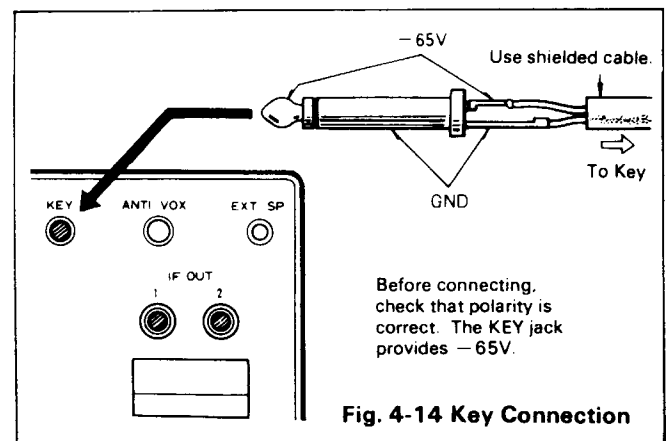


Fig. 4-14 Key Connection