

(1) Antenna Location Selection

Since ignition noise is generated by the vehicle's engine, the antenna must be installed as far from the engine as possible.

(2) Antenna Matching

In general, mobile antennas have a lower impedance than 50-ohm coaxial cable, resulting in a mismatch between the antenna and the coax. Such trouble can be eliminated by using an antenna tuner between the TS-130S(V) and the coaxial cable.

○ Matching Circuit Examples

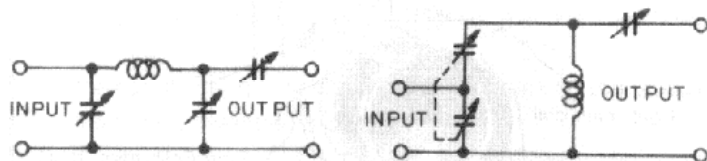


Fig. 4-12 Matching Circuits

(3) Bonding

The component parts of motor vehicles, such as the engine, transmission, muffler system, accelerator, etc., are coupled to one another at DC and low frequencies, but are isolated at high frequencies. By connecting these parts using heavy, braided ground straps, ignition noise can be reduced. This connection is called "bonding".

(4) Use Ignition Suppressor Cable or Suppressor Spark Plugs

Noise can be reduced by using spark plugs with internal resistors, or resistive suppressor ignition cable.

(5) Battery Power Connection

It is recommended that battery power be supplied directly to the TS-130S(V) from the battery terminals.

CAUTION:

Disconnect the TS-130S(V) before jump-starting or before charging the battery.

(6) Battery Capacity

The power system of a motor vehicle is comprised of a battery and an alternator (which generates power while the engine is running) to supply current to loads or to charge the battery.

Since the transceiver draws high current during transmit, care should be exercised so the power system is not overloaded. When using the transceiver, the following points should be observed from the viewpoint of battery maintenance:

- ① Turn the transceiver OFF when the lights, heater, wipers and other high-draw accessories are used.
- ② Avoid transceiver operation when the engine is not running.

- ③ If necessary, use an ammeter and/or a voltmeter to check battery condition.

4.9 FIXED STATION OPERATION

4.9.1. Power

The TS-130V power requirement is 4A at 13.8 VDC when transmitting with full power. The model PS-20 power supply for fixed stations matches the TS-130V in design and performance.

The TS-130S requires more than 18A at 13.8 VDC when transmitting with full power. Use the model PS-30 power supply for fixed stations.

4.9.2. ANTENNA

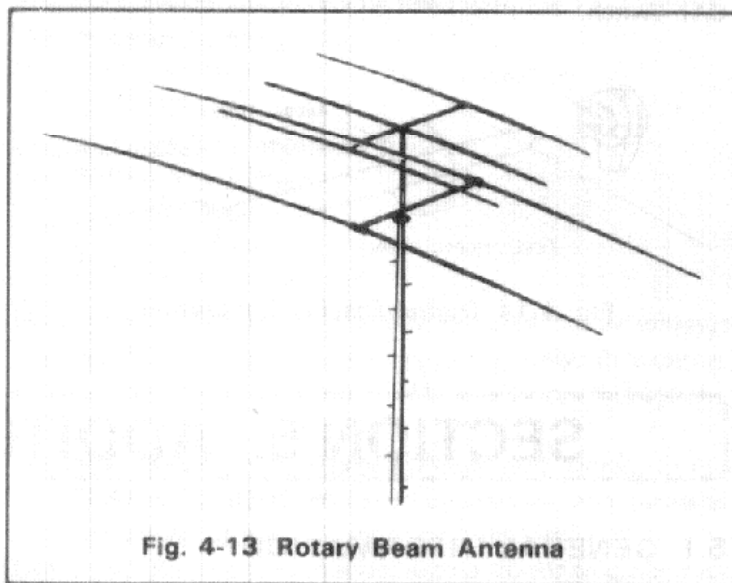


Fig. 4-13 Rotary Beam Antenna

For HF fixed-station operation, an antenna specifically designed for amateur operation is recommended. Antenna types include the wire antennas, verticals, rotary beam, and other antennas. HF antennas are quite large and must be installed to withstand strong wind, heavy rain, etc.

Any antenna used with the TS-130S(V) should be of 50-ohm impedance and should be connected using an appropriate coaxial cable such as RG-8/U.

Impedance matching is important. Impedance mismatching will result in a high VSWR and power loss, or can cause unwanted harmonic radiation and interference (TVI, BCI).

The impedance match can be checked with an SWR meter. Generally satisfactory operation is assured when the VSWR (Voltage Standing Wave Ratio) is less than 1.5:1.

For impedance matching between the antenna system and transceiver, use of the AT-130 Antenna Tuner (option) is recommended. A rotary beam antenna is very effective for DX operation in the 14, 21 and 28 MHz bands. (Fig. 4-13)

NOTE:

Protect your equipment — use a lightning arrestor.

4.10 DIGITAL DISPLAY CALIBRATION (Fig. 4-14)

Connect the antenna and set the BAND switch to 10. Turn the main tuning dial to about "0" to receive the 10 MHz WWV signal. Adjust the dial until a low-frequency beat is heard. Next, depress the CAL switch and a marker signal is superimposed on the WWV beat signal. A double beat (two beat signals of high and low frequencies) will now be heard.

While receiving this double beat, adjust the Counter unit trimmer through the reference frequency adjustment access opening (at the side of the TS-130S(V) so the two beats are heard as a single beat. This completes calibration of the Digital Display. After calibration depress and release the CAL switch.

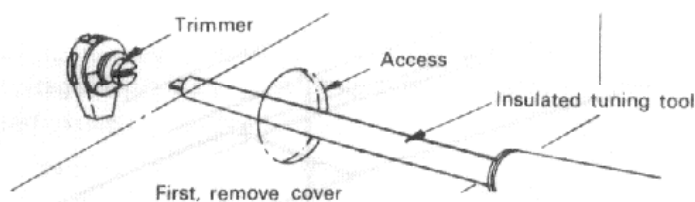


Fig. 4-14 Digital Display Calibration

4.11 ANALOG DIAL CALIBRATION (Fig. 4-15)

The main dial scale is graduated at 1-kHz intervals. One revolution of the main dial covers 25 kHz. To calibrate the scale, turn the CAL switch ON AND IN SSB mode zero-beat. Hold the main tuning knob from rotating and slip the calibration ring to the nearest major (5 kHz) graduation. The dial is now calibrated.

Note: For exact frequency, read the Digital Display.

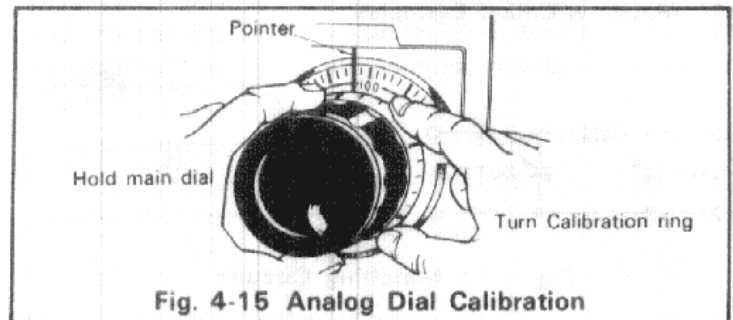


Fig. 4-15 Analog Dial Calibration

SECTION 5. ADDITIONAL INFORMATION

5.1 GENERAL INFORMATION

Your TS-130S(V) has been factory aligned and tested to specification before shipment. Under normal circumstances, the transceiver will operate in accordance with these operating instructions.

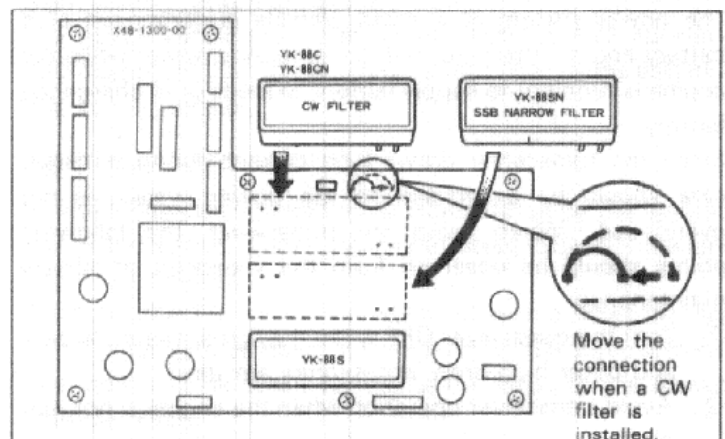
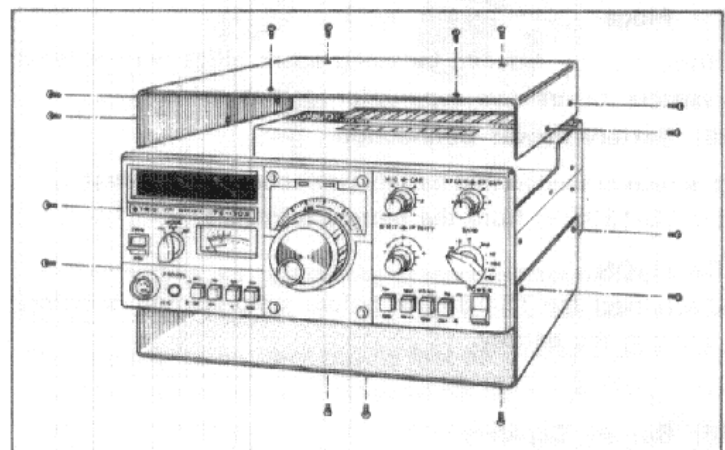
If your transceiver fails to work, contact the authorized dealer from whom you purchased it for quick, reliable repair.

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 transceiver's warranty.

5.2 INSTALLING THE OPTIONAL FILTER

1. Using a #2 philips screwdriver, remove the top cover (8 screws). Be careful of the VOX controls, and the speaker lead, which may be unplugged.
2. Remove the bottom cover (7 screws).
3. Remove 6 screws from the IF unit and swing the board up and towards the center of the radio.
4. Using a 45W (or less) soldering pencil, clear the 6 holes for the filter, if they are filled with solder.



5. There is no polarity to the filter. Install the filter into its position on the IF unit. Solder the 2 mounting tabs, and the 4 input and output pins to the circuit board. Solder sparingly, and heat the connections only long enough to insure a good solder joint. Don't overheat the filter or circuit board.
6. Carefully inspect your soldering. Be certain that all pins are actually soldered, and that you have not soldered across any spots on the board or between any of the pins on the filter. Clip the pins flush to the board.
7. Replace the IF unit in its place. Make certain no wires will be pinched underneath the board. Replace the 6 screws.
8. Move the connector as illustrated when a CW filter is installed.
9. Reinstall the bottom cover. Reconnect the speaker lead, and reinstall the top cover.
10. Apply power and verify your work. Filter installation is now complete.

5.3 TS-130S(V) 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, loosen set screws and line 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 (center 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 trimmer cap to the desired frequency (14.450.0) LESS the error, or 14.434.0. Next adjust the VFO inductor L10 (front 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 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.

5.4 HOW THE TX FINAL TRANSISTORS ARE PROTECTED

Final transistor protection is provided by sampling the reflected power. As the reflected power is increased (higher SWR) transmitter drive is reduced, thus decreasing input to the final transistors. This in turn reduces collector loss, protecting the final transistors.

5.5 TRANSMITTING ON WARC BANDS

As supplied, the TS-130S(V) 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: On the Rf unit X44-1380-00 unplug J5 (or cut the brown wire).
2. Of for individual Bands: On the RF unit:

Band	Remove (orcut) Part
10 MHz	D8
18 MHz	D9
24.5 MHz	D10

5.6 PHONE PATCH OPERATION

The PC-1 Phone Patch may be used with the TS-130S(V). Recommended settings are:

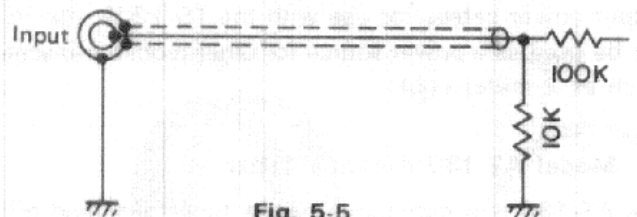
PC-1	RX Gain	4
	TX Gain	4
	Null	as necessary
TS-130S(V)	Vox Gain	1
	AF Gain	4
	Mic Gain	5
	Anti Vox	Max

Most other phone patches will work satisfactorily without any modification to the radio, requiring only an external speaker connection, and that the Mic line be run through the patch.

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

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

On the AF Gen unit X49-1110-01 install the fixed divider at the junction of R43 10k, C42 100pf, and C43 1uF (input of Q18). Add an RCA jack, or use remote pins 7 and Gnd for input.



5.7 ORDERING SPARE PARTS

When ordering replacement or spare parts for your equipment, be sure to specify the following:

- Model and serial number of your transceiver, 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.

5.8 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. Tag all returned items with your call for easy I.D.

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.

NOTES:

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 6. OPTIONAL ACCESSORIES

The following optional accessories are available for use with the TS-130S(V).

■ * Model PS-20 Regulated DC Power Supply

Perfectly matches the design and characteristics of the TS-130V. Equipped with a protection circuit which guards transceiver against damage due to shorts or overload.

■ Model PS-30 Regulated DC Power Supply

The PS-30 is a regulated DC power supply with a large capacity. The output is 13.8 VDC/20A (Intermittent). Since terminals for 13.8 VDC/5A are also provided, in addition to output power cables for use with the TS-130S, the PS-30 can be used as a power source for other mobile transceivers (such as 2-meter rigs).

■ Model AT-130 Antenna Tuner

The AT-130 is a compact antenna tuner designed for use with the TS-130S(V) in either a mobile or fixed station. The SWR meter is illuminated so that it can be used in the car even at night. Also, it is equipped with a highly accurate SWR detecting circuit for matching within the impedance range between 20 and 300 ohms on all bands between 3.5 and 29.7 MHz.

■ Model DFC-230

A compact digital frequency controller with special design emphasis on mobile operation. It contains a digital VFO operating at 20 Hz steps and a 4 channel memory. Remote

frequency control by the up/down switch on the supplied microphone is possible, as is "cross" operation with the TS-130S(V).

■ Model VFO-120

The VFO-120 is an all solid-state VFO with high stability, designed to match the TS-130S(V) in design and performance. "Split frequency" operation is possible by using the TS-130S(V) with the VFO-120. Also, the T-F switch makes it possible to check the transmit frequency while in the receiving mode.

■ Model SP-120 External Speaker

The SP-120 is an external speaker designed exclusively for use with the TS-130S(V). It matches the TS-130S(V) in design and tone quality.

■ MICROPHONE MC-30S, MC-35S

Dynamic microphone with PTT switch specifically designed for mobile operation.

Impedance: 50 k Ω (MC-30S)

500 Ω (MC-35S)

■ MICROPHONE MC-50

Unidirectional dynamic microphone with locking PTT switch provides excellent performance for VOX operation.

Impedance: 50 k Ω and 600 Ω (switchable)

■ HEADPHONE HS-4

High-performance dynamic headphones with specially designed ear pads for comfortable listening.
Impedance: 8Ω

■ * DELUXE HEADPHONE HS-5

Open-back type headphone designed for excellent tone quality and comfortable fit. The vented ear pads can be readily replaced with sealed cushions.

■ YK-88C AND YK-88CN CW CRYSTAL FILTERS

The selectivity of the YK-88C is 500 Hz at -6 dB, and 1.5 kHz at -60 dB. That of the YK-88CN is 270 Hz at -6 dB, and 1.1 kHz at -60 dB. Easily installed in the TS-130S(V).

■ SSB NARROW FILTER YK-88SN

Narrow band SSB filter. Combined with the IF shift feature, it provides outstanding interference rejection.

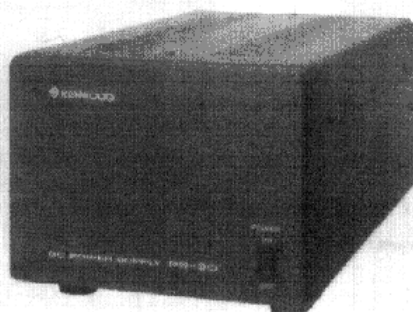
■ HAM-CLOCK HC-10

The HC-10 is a highly advanced world clock with dual display which can memorized 10 world major cities and 2 additional regions.

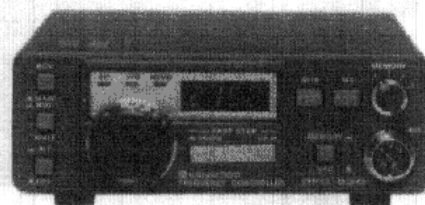
PS-20



PS-30



DFC-230



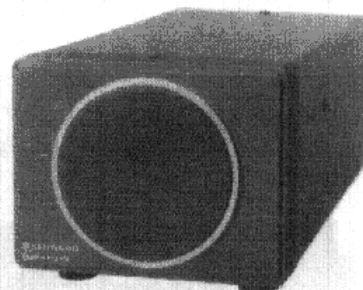
VFO-120



AT-130



SP-120



MC-50



MC-30S, MC-35S



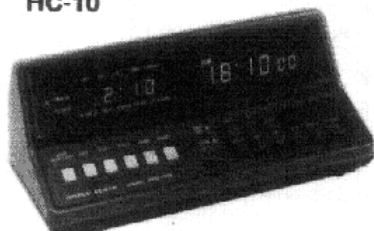
HS-5



HS-4

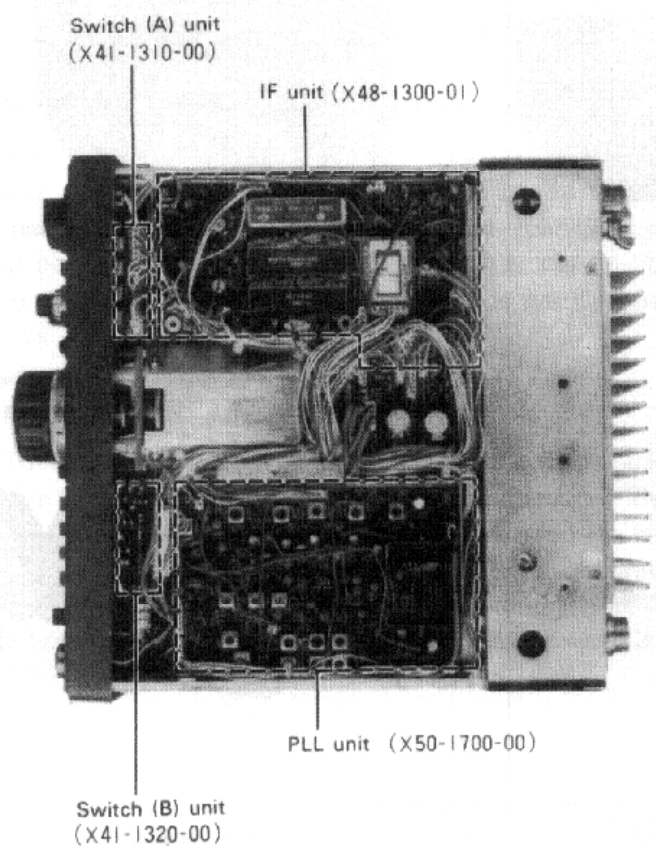
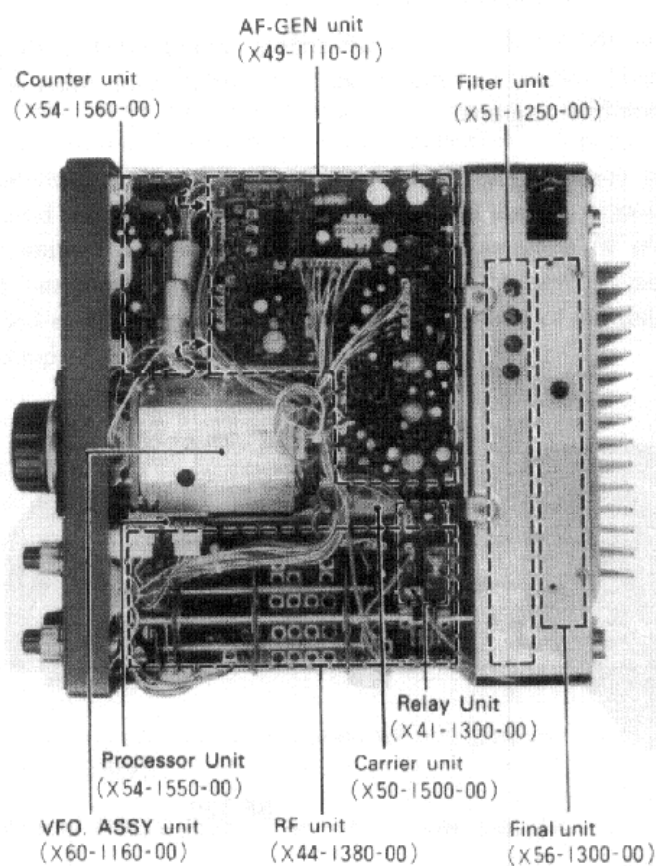


HC-10

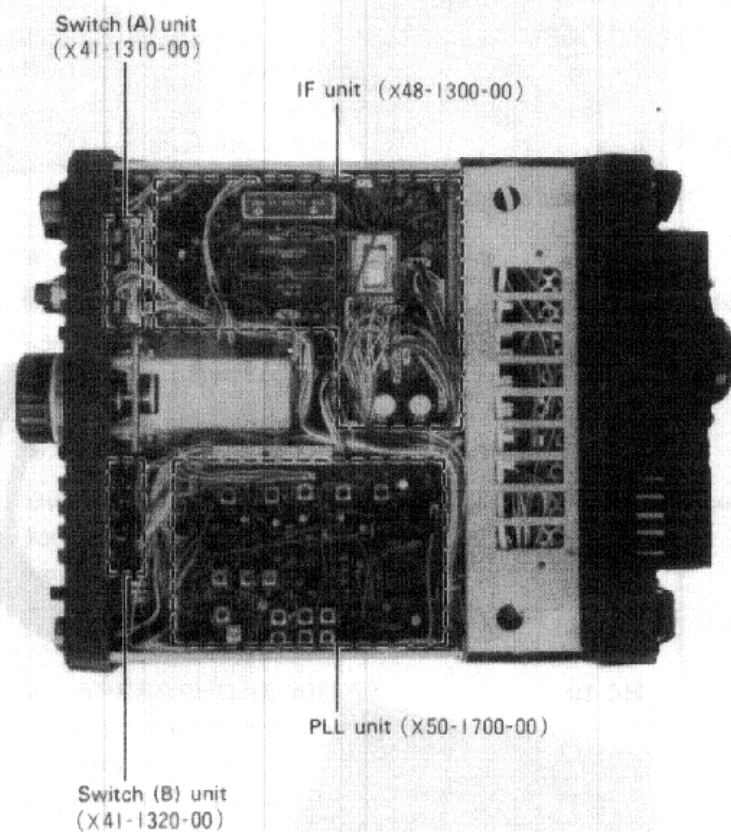
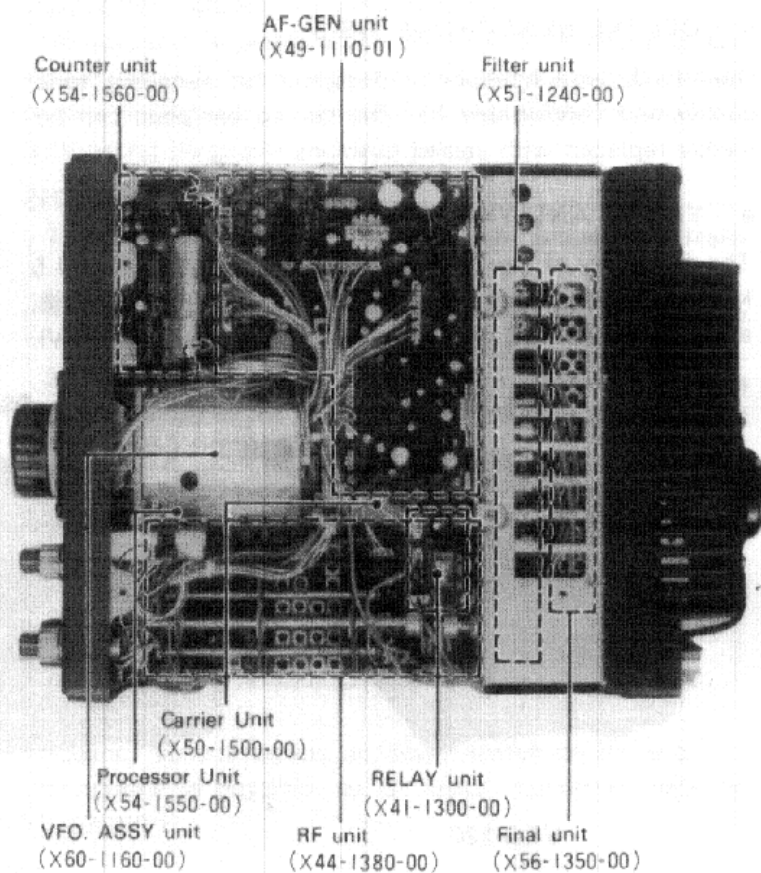


INTERNAL VIEWS

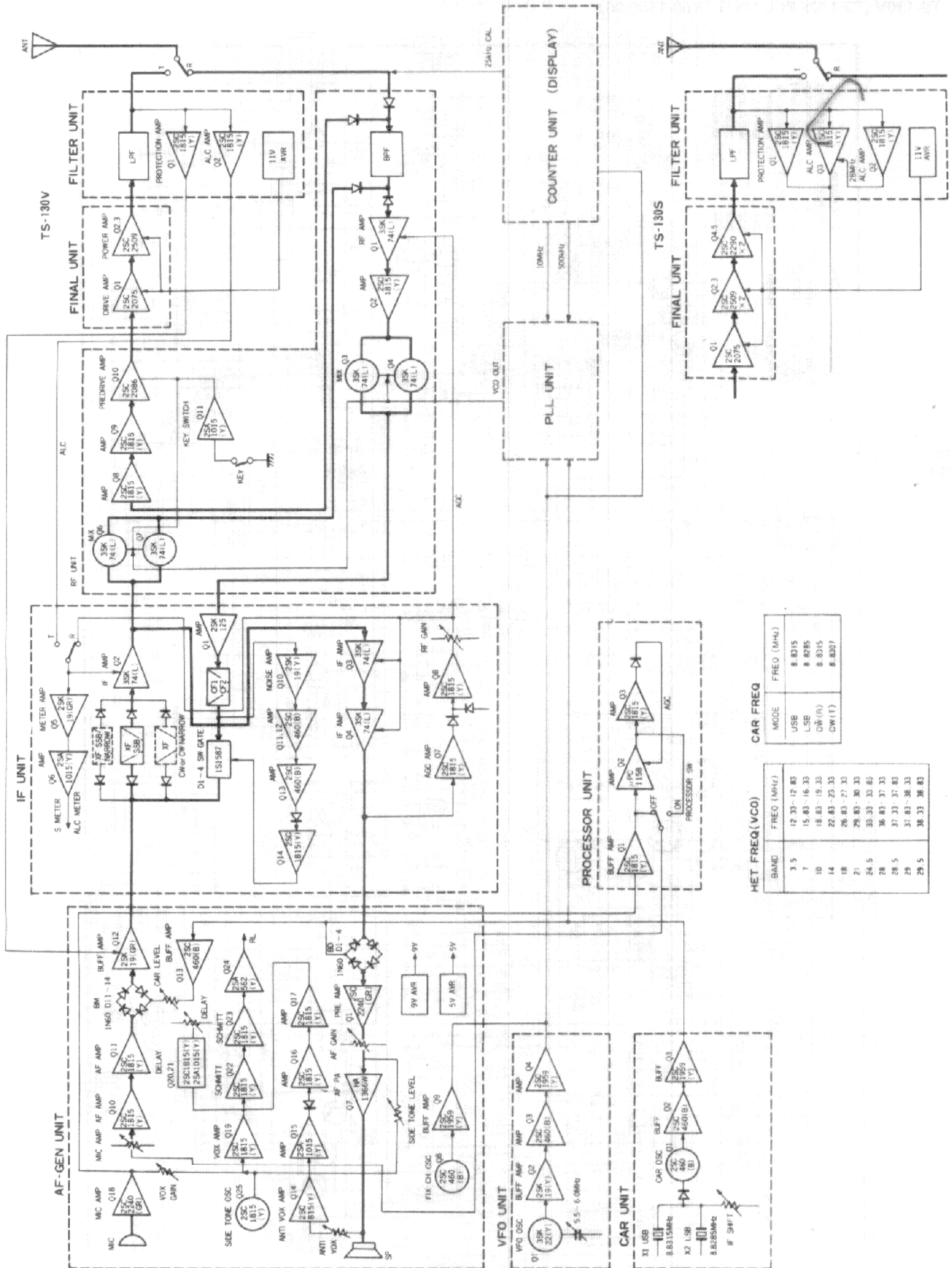
TS-130V



TS-130S



BLOCK DIAGRAM



TS-130V ,TS-130S PLL UNIT (X50-1500-00)

