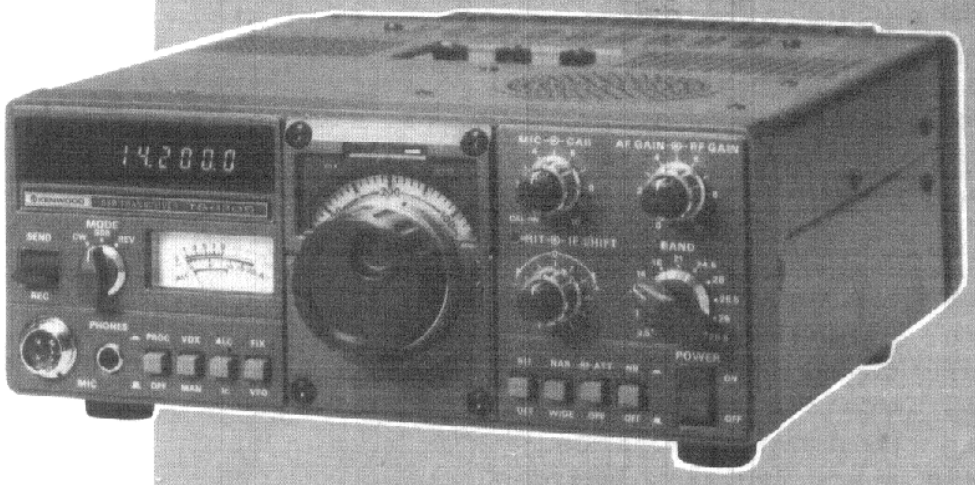
KENWOOD

# HF SSB TRANSCEIVER

# Model TS-130S TS-130V




## INSTRUCTION MANUAL

# INTRODUCTION

You are the owner of our latest product, the new TS-130S(V) transceiver. Please read this instruction manual carefully before placing your transceiver in service. The unit has been carefully engineered and manufactured to rigid quality standards, and should give you satisfactory and dependable operation for many years.

## AFTER UNPACKING:

- Shipping container:
  Save the boxes and packing in the event your unit needs to be transported for remote operation, maintenance, or service.
- The following explicit definitions apply in this manual:
  **Note:** If disregarded inconvenience only, no risk of equipment damage or personal injury.
  **Caution:** Equipment damage may occur, but not personal injury.

# CONTENTS


SPECIFICATIONS ..... 3
SECTION 1. FEATURES ..... 4
SECTION 2. PREPERATION FOR USE
2.1 ACCESSORIES ..... 4
2.2 INSTALLATION ..... 4
2.3 INTERCONNECTION ..... 5
SECTION 3. CONTROLS
3.1 FRONT PANEL ..... 7
3.2 REAR TOP PANEL ..... 9
SECTION 4. OPERATION
4.1 RECEPTION ..... 10
4.2 TRANSMISSION ..... 11
4.3 VOX OPERATION ..... 12
4.4 SEMI-BREAK-IN OPERATION ..... 13
4.5 OPRATION WITH A LINEAR AMPLIFIER ..... 13
4.6 FIXED CHANNEL OPERATION ..... 13
4.7 CW OPERATION ..... 14
4.8 MOBILE OPERATION ..... 15
4.9 FIXED STATION OPERATION ..... 17
4.10 DIGITAL DISPLAY CALIBRATION ..... 17
4.11 ANALOG DIAL CALIBRATION ..... 17
SECTION 5. ADDITIONAL INFORMATION ..... 18
SECTION 6. OPTIONAL ACCESSORIES ..... 20
INTERNAL VIEWS ..... 22
BLOCK DIAGRAM ..... 23
SCHEMATIC DIAGRAM ..... 24~31

# TS-130S, TS-130V SPECIFICATIONS

## [GENERAL]

**Frequency Ranga:**

| | |
|---|---|
| 80 meter band | 3.5 ~ 4.0 MHz |
| 40 meter band | 7.0 ~ 7.3 MHz |
| *30 meter band | 10.1 ~ 10.15 MHz (10.0 MHz Receiving only) |
| 20 meter band | 14.0 ~ 14.35 MHz |
| *17 meter band | 18.068 ~ 18.168 MHz |
| 15 meter band | 21.0 ~ 21.45 MHz |
| *12meter band | 24.89 ~ 24.99 MHz |
| 10 meter band | 28.0 ~ 29.7 MHz |

**Mode:** SSB/CW

**Power Requirement:**

| TS-130S | TS-130V |
|---|---|
| RX: 0.7A 13.8V DC<br>TX: 18A 13.8V DC | RX: 0.7A 13.8V DC<br>TX: 4A 13.8V DC |

**Dimensions:**

| TS-130S | TS-130V |
|---|---|
| 241 (9.6) W × 94 (3.8) H ×<br>293 (11.7) D m)c | 241 (9.6) W × 94 (3.8) H ×<br>235 (9.4) D mm (inch) |

**Weight:**

| TS-130S | TS-130V |
|---|---|
| 5.6 kg (12.4 lbs) | 4.9 kg (10.8 lbs) |

## [TRANSMITTER]

**Final Power Input:**

| TS-130S | TS-130V |
|---|---|
| 80 — 15 meter band<br>200 W PEP for SSB operation<br>160 W DC for CW operation<br>10 meter band<br>160 W PEP for SSB operation<br>140 W DC for CW operation | <br>25W PEP for SSB operation<br>20W DC for CW operation<br><br>25W PEP for SSB operation<br>20W DC for CW operation |

**Audio Input Impedance:** 500Ω~50 kΩ
**RF Output Impedance:** 50Ω
**Frequency Stability:** Within 100 Hz during any 30-minute period after warmup
Within ±1 kHz during the first hour after 1 minute of warmup
**Carrier Suppression:** Better than 40 dB
**Sideband Suppression:** Better than 50 dB
**Spurious Radiation:** Better than 40 dB
**Harmonic Radiation:** Better than 40 dB

## [RECEIVER]

**Receiver Sensitivity:** 0.25μV at 10 dB S+N/N
**Image Ratio:** Better than 50 dB
**IF Rejection:** Better than 70 dB
**Receiver Selectivity:**

| | |
|---|---|
| **SSB/CW WIDE** | 2.4 kHz (—6 dB), 4.2 kHz (—60 dB) |
| **SSB NARROW** | 1.8 kHz (—6 dB), 3.3 kHz (—60 dB) with optional YK-88SN filter |
| **CW NARROW** | 500 Hz (—6 dB), 1.5 kHz (—60 dB) with optional YK-88C filter |
| | 270 Hz (—6 dB), 1.1 kHz (—60 dB) with optional YK-88CN filter |

**Audio Output Impedance:** 4~16Ω
**Audio Output:** 1.5 W

**NOTE:** Circuit and ratings may change without notice due to developments in technology.

* Will transmit on the new 30, 17, and 12 meter bands. Diodes installed for preventing accidental transmission before government amateur arthorization.

# SECTION 1. FEATURES

### 1. SINGLE-CONVERSION SYSTEM USING PLL CIRCUITRY

The single-conversion system, with a unique Phase Locked Loop circuit, FET balanced mixers and MOS FET's, assures excellent spurious and intermod characteristics.

### 2. BUILT-IN DIGITAL DISPLAY

The digital display affords easy reading of operating frequency to an accuracy of 100 Hz on any band and any mode.

### 3. BUILT-IN IF SHIFT CIRCUIT (Passband Tuning)

An IF SHIFT system is built into the transceiver to allow shifting the IF passband, thereby eliminating adjacent channel interference.

### 4. 3.5 ~ 29.7 MHz BAND

The transceiver is designed to operate on LSB/USB/CW in the 3.5 ~ 29.7 MHz bands. As supplied, the 10, 18, and 24.5 MHz bands are for reception only.

### 5. COMPACT, LIGHTWEIGHT DESIGN

The TS-130S(V) has many advanced features, yet it is compact and lightweight, suitable for mobile and field operations as well as fixed-station operation.

### 6. EASY OPERATION

All controls and switches are carefully arranged for ease of operation, ensuring convenience and versatility.

### 7. ALL SOLID-STATE DESIGN

The all solid-state, compact unit features a wide-band final stage, eliminating the need for peaking controls.

### 8. FOUR FIXED CHANNELS

Four FIXED channels can be installed, one for each of 7, 14, 21 and 28 MHz bands. The 3.5 MHz and 28 MHz FIXED XTAL position can be exchanged by simply moving a connector on the AF-GEN unit. The 10 and 18 MHz bands are shared by the 14 MHz band, and the 24.5 MHz band is shared by the 28 MHz band.

### 9. FULL RANGE OF AUXILIARY FUNCTIONS

Equipped with VOX, balanced-gate noise blanker for pulse noise rejection, a 25 kHz marker, and processor circuits.

### 10. SSB narrow filter YK-88SN

An optional SSB harrow filter YK-88SN can be instolled. (Reception only)

### 11. OPTIONAL CW FILTERS YK-88C AND YK-88CN

The TS-130S(V) permits use of the optional YK-88C or YK-88CN CW filter (Reception only). CW semi-break-in operation is provided using the built-in VOX and CW side-tone circuits.

### 12. WIDE VARIETY OF OPTIONAL ACCESSORIES

The following optional accessories are available: Regulated power supply (PS-30) for the TS-130S, or (PS-20) for the TS-130V, frequency controller (DFC-230), external VFO (VFO-120), external speaker (SP-120), mobile mount (MB-100), CW filter (YK-88C), CW narrow filter (YK-88CN), SSB narrow filter (YK-88SN), and other optional units are available.

# SECTION 2. PREPERATION FOR USE

## 2.1 ACCESSORIES

The following accessories are furnished with the TS-130S(V):

| | |
|---|---|
| External speaker plug (E12-0001-05) | 1 |
| 7P DIN remote plug (E07-0751-05) | 1 |
| DC power cord (TS-130S) (E30-1638-05) | 1 |
| (TS-130V) (E30-1675-05) | 1 |
| Fuse, 20A (TS-130S) (F05-2034-05) | 1 |
| 4A (TS-130V) (F05-4022-05) | 1 |
| 4P MIC plug (E07-0403-05) (Excluded in U.S.A.) | 1 |

## 2.2 INSTALLATION

It is preferable to choose an operating location that is dry and cool, and to avoid operating the transceiver in direct sunlight.

Allow adequate ventilation, particularly during mobile operation.

**NOTE:**

The TS-130S(V) is supplied to receive on the following frequencies (transmission is disabled):

10 MHz band (10.0—10.25 MHz)
18 MHz band (18.0—18.5 MHz)
24.5 MHz band (24.5—25.0 MHz)

## 2.3 INTERCONNECTION

Connect the transceiver as illustrated in Fig. 2-1, 2-2.

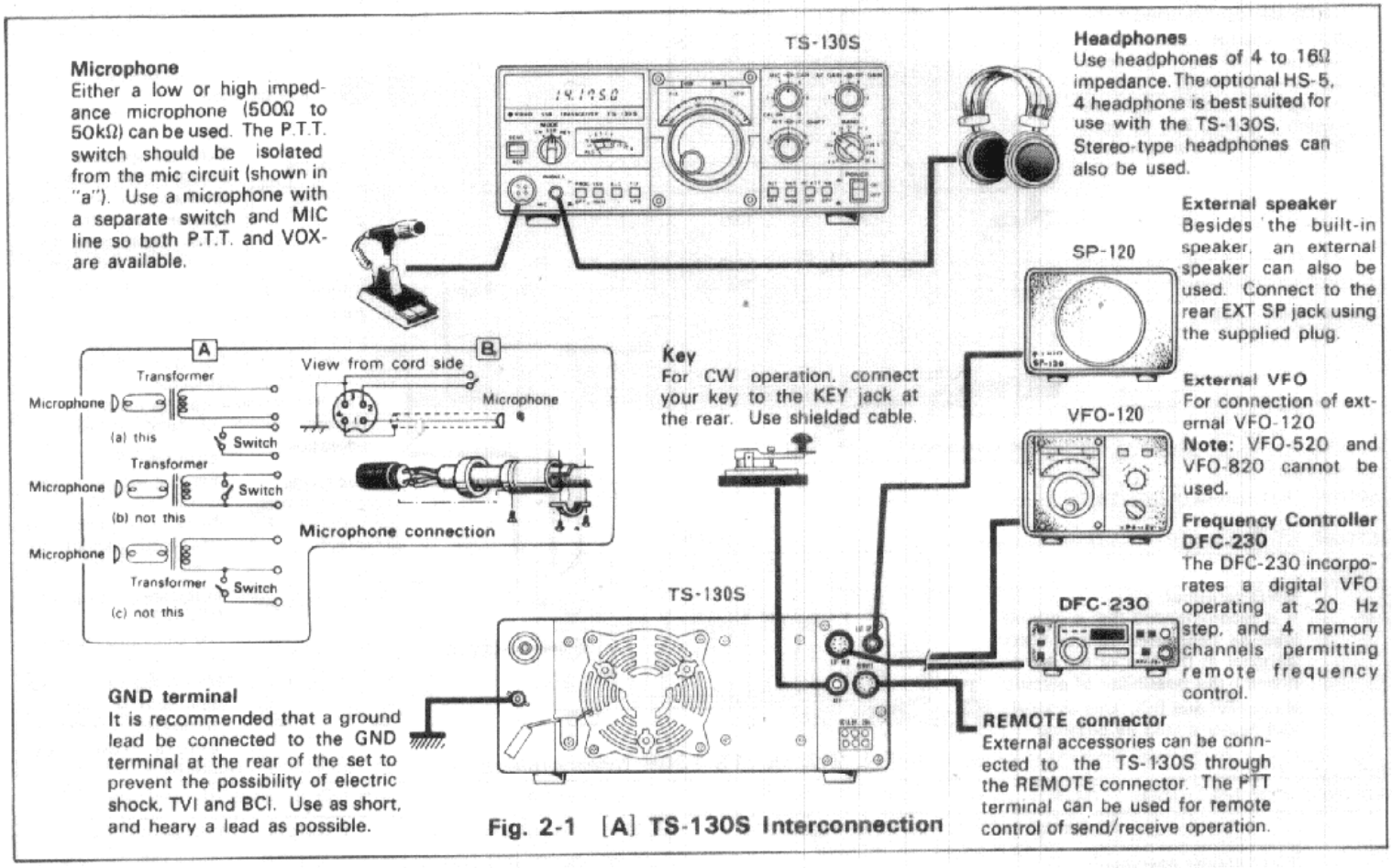



**Fig. 2-1 [A] TS-130S Interconnection**

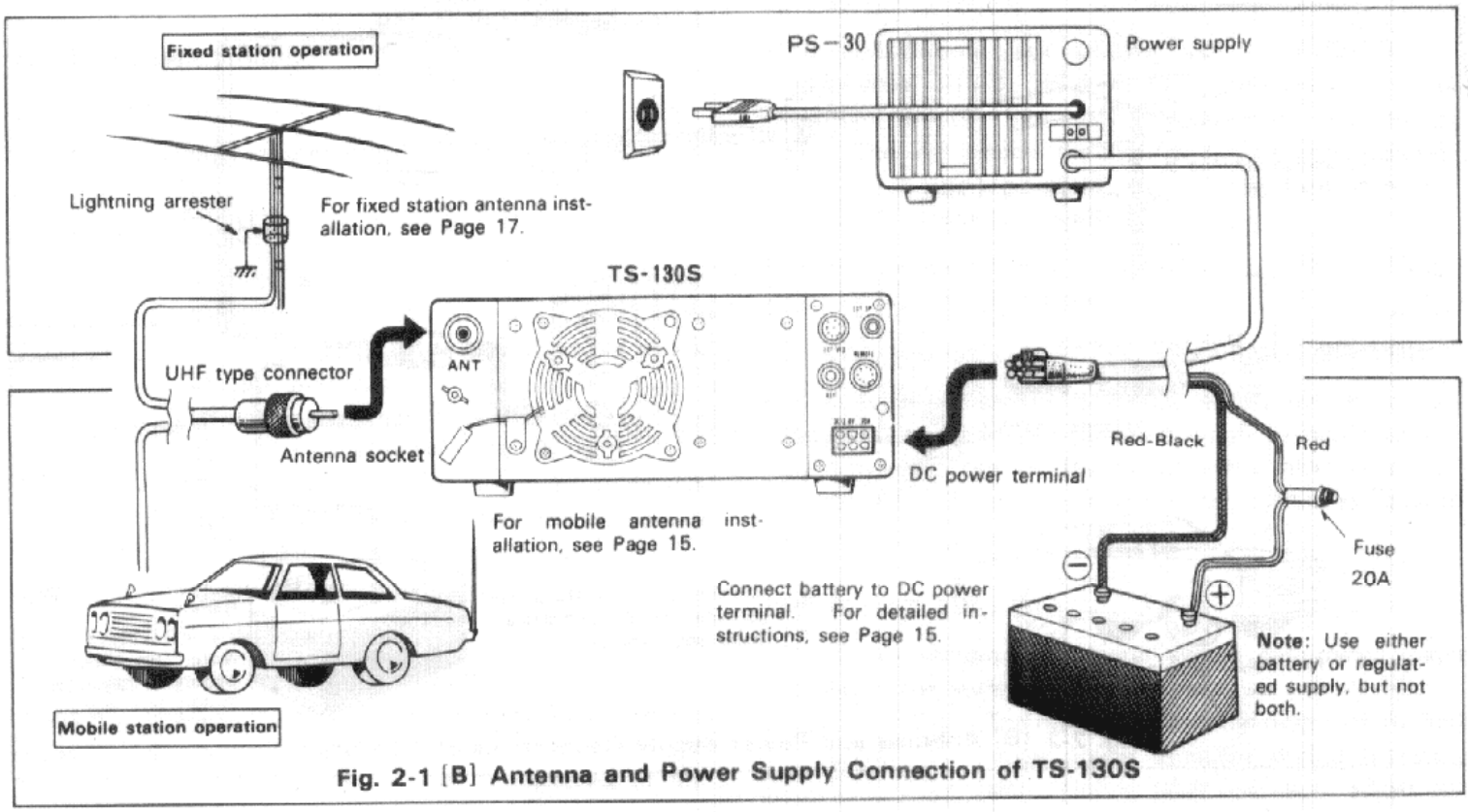
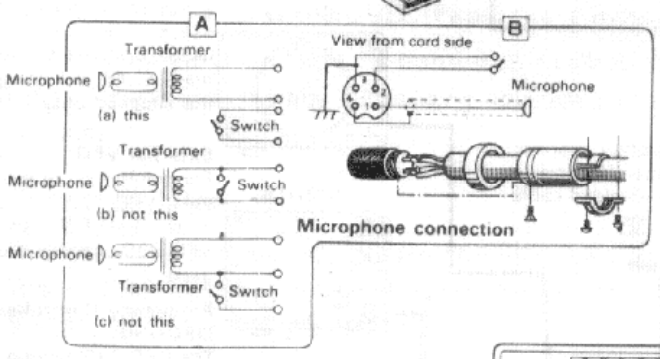
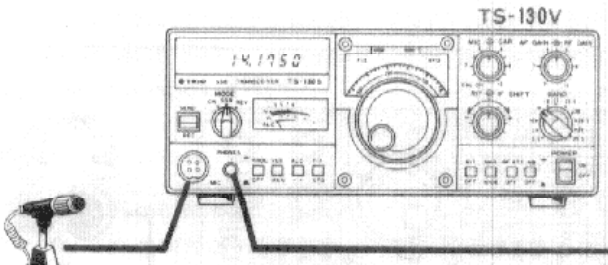



**Fig. 2-1 [B] Antenna and Power Supply Connection of TS-130S**

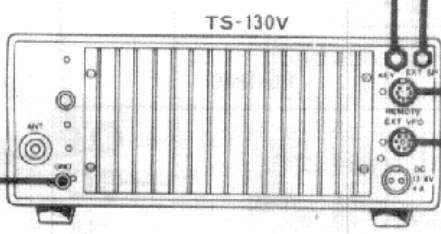
**Microphone**
Either a low or high impedance microphone (500Ω to 50 kΩ) can be used. The P.T.T. switch should be isolated from the mic circuit (shown in "a"). Use a microphone with a separate switch and MIC line so both P.T.T. and VOX are available.




**GND terminal**
It is recommended that a ground lead be connected to the GND terminal at the rear of the set to prevent the possibility of electric shock, TVI and BCI. Use as short, and heavy a lead as possible.




**Key**
For CW operation, connect your key to the KEY jack at the rear. Use shielded cable.

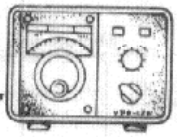



**Headphones**
Use headphones of 4 to 16Ω impedance. The optional HS-5, 4 headphone is best suited for use with the TS-130V. Stereo-type headphones can also be used.

**External speaker**
Besides the built-in speaker, an external speaker can also be used. Connect to the rear EXT SP jack using the supplied plug.


**REMOTE connector**
External accessories can be connected to the TS-130V through the REMOTE connector.
The PTT terminal can be used for remote control of send/receive operation.

**External VFO**
For connection of external VFO-120
**Note:** VFO-520 and VFO-820 cannot be used.




**Frequency Controller DFC-230**
The DFC-230 incorporates a digital VFO operating at 20Hz step, and 4 memory channels permitting remote frequency control.

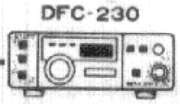
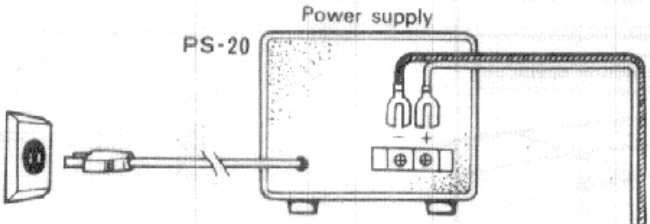
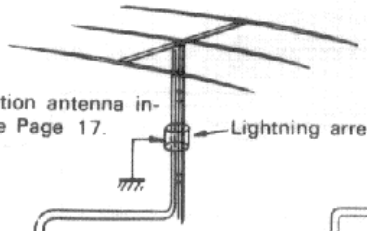


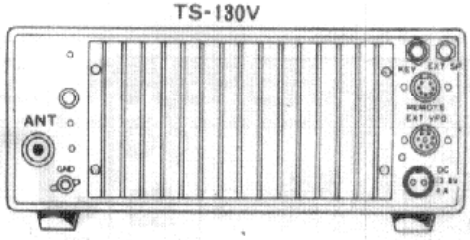

**Fig. 2-2 [A] TS-130V Interconnection**

**Fixed station operation**




For fixed station antenna installation, see Page 17.




UHF type connector

Antenna socket

DC power terminal

Grey-Black

Red-White

Fuse
4A

Battery

For mobile antenna installation, see Page 15.

Connect battery to DC power terminal. For detailed instructions, see Page 15.

**Note:** Use either battery or regulated supply, but not both.

**Fig. 2-2 [B] Antenna and Power Supply Connections of TS-130V**

# SECTION 3. CONTROLS

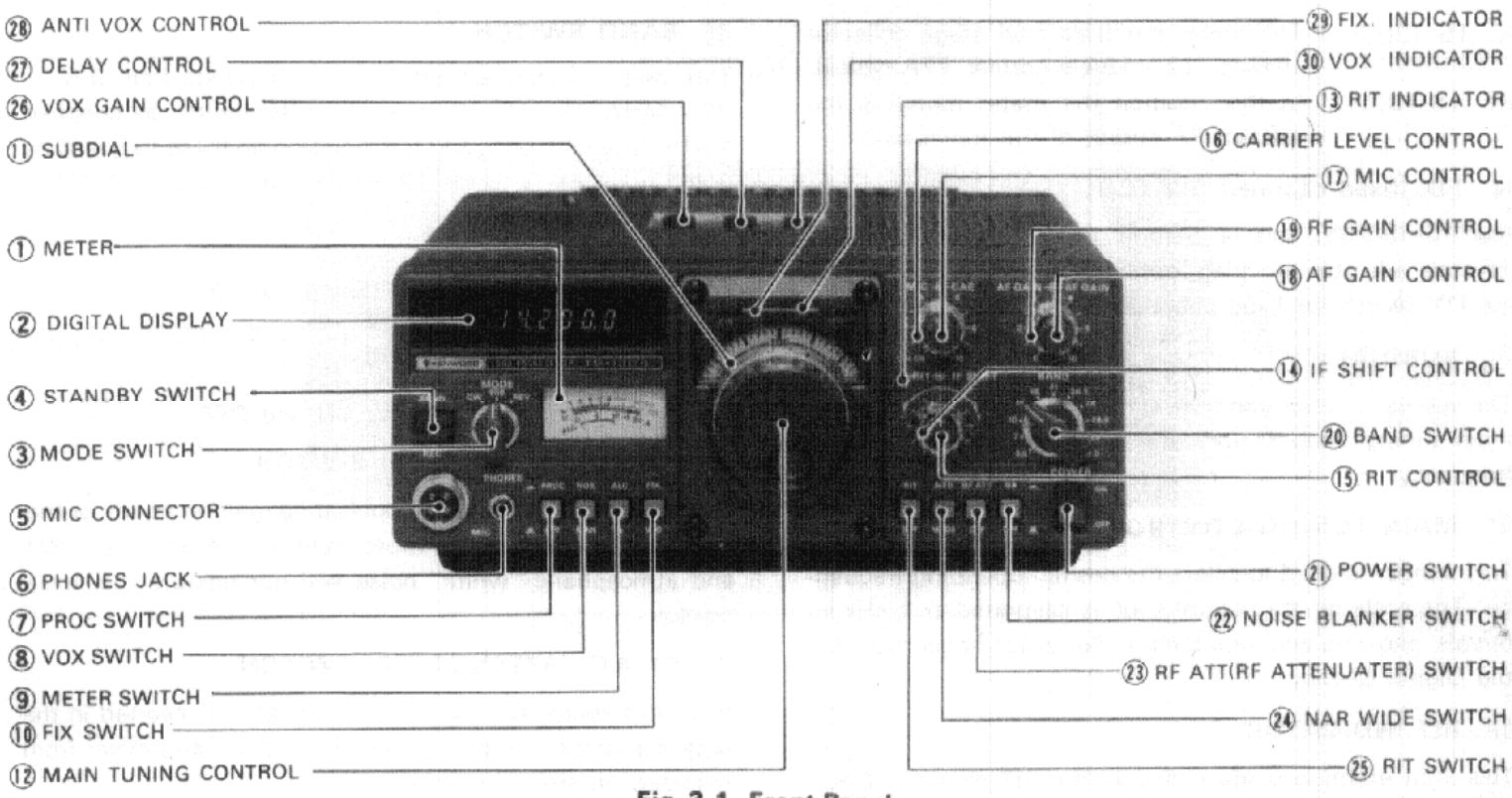



**Fig. 3-1 Front Panel**

## 3.1 FRONT PANEL

### ① METER

The meter has three functions, two being selected by the METER switch. In receive the meter is automatically an S-meter showing receive signal strength on a scale of 1 ~ 9, 9 + 20, + 40 and + 60 dB. In transmit, the meter shows Ic (TS-130S), RF output (TS-130V) or ALC level depending on METER switch position.

### ② DIGITAL DISPLAY

The digital display indicates true operating frequency to an accuracy of 100 Hz.

### ③ MODE SWITCH

SSB ..... Permits SSB operation. LSB is normally selected for opration on the 3.5 and 7 MHz bands, and USB for operation on and above the 10 MHZ bands.
Switching between LSB and USB is done automatically by the BAND switch.

REV ..... During SSB operation, this position selects the reverse side band from USB to LSB or vice versa.

CW ..... Used for CW operation.

### ④ STANDBY SWITCH

This switch selects receive or transmit function.
In the REC position. the transceiver is normally in the receive mode unless the microphone PTT switch is depressed. In the SEND position, the TS-130S(V) is switched to the transmit mode.

**CAUTION:** Do not transmit without an antenna or dummy load. Equipment damage will occur. Such damage is not covered by warranty.

### ⑤ MIC CONNECTOR

Connect your microphone (MC-30S, MC-35S, MC-50, etc.), referring to Fig. 2-1, 2-2. The TS-130S(V) accepts both low and high impedance microphones.

### ⑥ PHONES JACK

The headphone jack allows use of 4-to-16-ohm headphones. HS-5, HS-4 optional headphones provide optimum results. Stereo-type headphones can also be used. This will disable the internal and external speaker.

### ⑦ PROC (processor) switch

During SSB transmission, the speech processor may be used to increase "talk power".

### ⑧ VOX (VOICE OPERATED TRANSMIT) SWITCH

This function is used for SSB VOX or CW semi-break-in - operation. In the MAN (manual) position, the transceiver is keyed by either the standby switch or the microphone PTT switch. For VOX operation, the standy switch remains in REC. (See page 12.)

### ⑨ METER SWITCH

During transmission, the meter switch determines meter function. The switch selects between:

ALC ..... The meter monitors the output of the final stage power amplifier during transmission. During SSB operation, adjust the MIC control so that the meter pointer is within the ALC zone. Similarly, adjust the CAR control for CW operation.

IC (TS-130S).... The meter monitors final stage collector current. 12～19A is normal, 17A typical.

RF (TS-130V)... In this position the meter monitors the relative RF output of the transceiver.

### ⑩ FIX (fixed channel) SWITCH

The TS-130S(V) has a built-in fixed channel oscillator (crystals are user-provided, optional) which is activated by the FIX switch for fixed channel or VFO operation.

### ⑪ SUBDIAL

The subdial is calibrated from 0 to 500. It is driven from the main tuning knob to indicate the transceiver's operating frequency.

### ⑫ MAIN TUNING CONTROL

This control is used to select the desired operating frequency. The scale on the control knob is calibrated at 1 kHz intervals, allowing accurate tuning. For exact frequency, read the Digital Display.

### ⑬ RIT INDICATOR

This light emitting diode indicates the RIT circuit is ON.

### ⑭ IF SHIFT CONTROL

By using this control, the IF crystal filter center frequency can be shifted ±1 kHz, allowing adjustment of tone quality, or eliminating interference from adjacent frequencies.
For normal operation, this control should be set to the center "0" position (detent).

### ⑮ RIT CONTROL

When the RIT circuit is ON, this will vary receive frequency by about ±1.5 kHz. When the control is set to the "0" center position, there is no frequency shift.

### ⑯ CAR (CARRIER LEVEL) CONTROL

This control is used to adjust the carrier output level and is effective only during CW operation. Adjust the control so the ALC meter indication is within the ALC zone. For "QRP" operation, redoce carrier insection.

### ⑰ MIC (MICROPHONE GAIN) CONTROL

This adjusts mic amplifier gain during SSB operation. Again, adjust the control so the ALC meter indication is within the ALC zone.
When this control is set to the CAL ON position, the built-in calibrator is activated, permitting calibration of the receiver dial scale at 25 kHz intervals.

### ⑱ AF GAIN (AUDIO GAIN) CONTROL

This control adjusts the receiver audio amplifier gain. Volume of the received signal increases as the control is turned clockwise.

### ⑲ RF GAIN CONTROL

This adjusts the receiver section's RF amplifier gain. Turn the control fully clockwise for maximum gain. Turn counterclockwise to reduce the gain.

### ⑳ BAND SWITCH

This switch selects all entire Amateur bands from 3.5 — 29.7 MHz. The 10, 18, and 24.5 MHz bands as supplied are for reception only, and transmission on these frequencies is not possible. Use the 10 MHz band to receive WWV at 10.0 MHz.

**CAUTION:**
Do not turn the bandswitch during transmit.

### ㉑ POWER SWITCH

This switches the TS-130S(V) ON and OFF.

### ㉒ NB (NOISE BLANKER) SWITCH

This switch is used to reduce pulsating ignition noises of the type usually emitted from motor vehicles. Power-line, QRM and atmospheric "white" noise will not operate the noise blanker.

### ㉓ RF ATT (ATTENUATER) SWITCH

With this switch ON, A 20 dB attenuator is inserted in the antenna circuit, protecting the RF amplifier and mixer from overload on strong input signals.

### ㉔ NAR/WIDE switch

This switch selects receive IF bandwidths between narrow and wide. The WIDE position provides the same IF bandwidth for both CW and SSB. For the NARROW position, optional filters are avaidable for both CW and SSB.

### ㉕ RIT SWITCH

This push switch turns the RIT (Receiver Incremental Tuning) circuit ON and OFF. With the switch depressed, the circuit is activated and the RIT indicator is illuminated, allowing the receive frequency to be shifted by about ±1.5 kHz independent of the transmit frequency by using the RIT control. The RIT circuit is turned OFF when the switch is out.

### ㉖ VOX GAIN CONTROL

This control adjusts VOX circuit sensitivity for both SSB and CW operation.

### ㉗ DELAY CONTROL

This control is used to adjust the "Hold" time of the VOX circuit. Clockwise adjustment gives longer hold-time.

### ㉘ ANTI-VOX CONTROL

This control is used to adjust the VOX system so that it is not tripped by sound from the speaker.

### ㉙ FIX INDICATOR

The FIX indicator illuminates when the internal fixed frequency oscillator controls transceiver operation.

### ㉚ VFO INDICATOR

The VFO indicator illuminates when the internal VFO ceontrols transceiver operation. The indicator is not lighted during fixed channel or remote VFO operation.