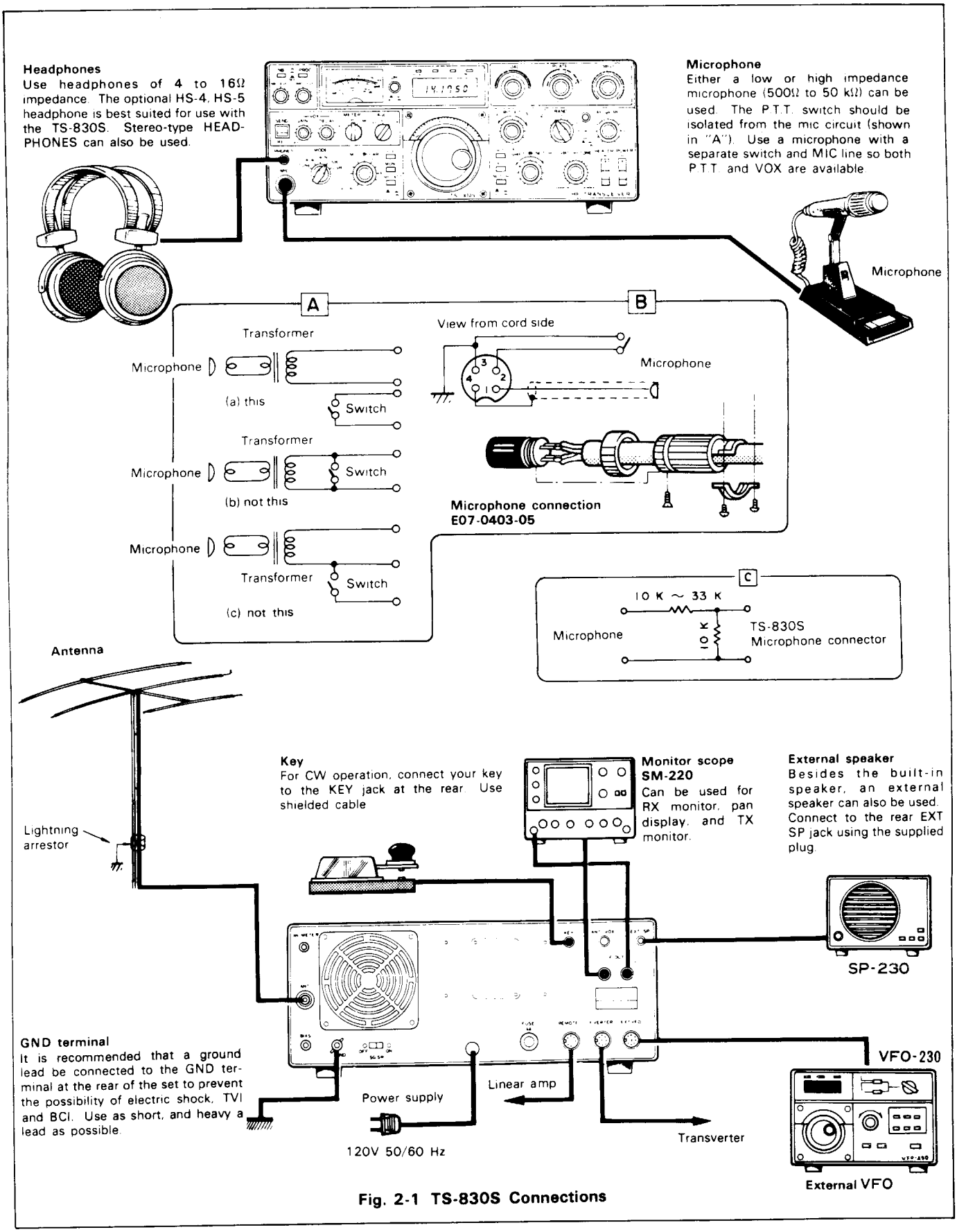

Fig. 2-1 TS-830S Connections

2.6 EXTERNAL SPEAKER AND HEADPHONES

Receive audio output from the TS-830S is 1.5 watts at 4 to 16 ohms. The TS-830S has a built-in the SPEAKER plus an external speaker jack on the rear panel. The speaker may be an 8-ohm permanent-magnet type, 4 inches or larger. The internal speaker is disconnected when an external speaker is used. Headphones should also be 4 to 16 ohms impedance. When the headphones are connected to the front-panel PHONES jack, the speaker is disabled.

2.7 GROUND

To prevent electric shock, and reduce the possibility of TVI and BCI, connect the transceiver to a good earth ground through as short and heavy a lead as possible.

2.8 ANTENNA

Any of the common antenna systems designed for use on the high frequency amateur bands may be used with the TS-830S, provided the input impedance of the transmission line is not outside the capability of the pi-output matching network. The transmission line should be coaxial cable. An antenna system which shows a standing wave ratio of less than 2 : 1 when using 50 or 75 ohm coaxial transmission line, or a system that results in a transmission line input impedance that is essentially resistive, and between 15 and 200 ohms will take power from the transceiver with little difficulty. If openwire or balanced type transmission line is used with the antenna, a suitable antenna tuner with balun is recommended between the transceiver and the feed line. Methods of construction and operating such tuners are described in detail in the ARRL Antenna Handbook, and similar publications. For operation on the 160, 75 and 40 meter bands, a simple dipole antenna, cut to resonance in the most used portion of the bands, will perform satisfactorily. For operation of the transceiver on the 10, 15 and 20 meter bands, the efficiency of the station will be greatly increased if a good directional rotary antenna is used. Remember that even the most powerful transceiver is useless without a proper antenna.

CAUTION:
Protect your Equipment — Use a LIGHTING ARRESTOR.

Mobile Station — Mobile antenna installations are critical, since any mobile antenna for use on the high frequency bands represents a number of compromises. Many amateurs lose the efficiency of their antenna through improper tuning. Remember the following points when using the TS-830S with a mobile antenna.

The "Q" of the antenna loading coil should be as high as possible.

The loading coil must be capable of handling the power of the transceiver without overheating. In the CW mode the power output of the transceiver will exceed 80 watts.

The SWR bridge is a useful instrument, but unfortunately it is quite often misunderstood, and overrated in importance. Basically, the SWR bridge will indicate how closely the antenna load impedance matches the transmission line. With long transmission lines, such as will be used in many fixed station installations, it is desirable to keep the impedance match fairly close in order to limit power loss. This is particularly true at the higher frequencies. The longer the line, and the higher the frequency, the more important SWR becomes. However, in mobile installations the transmission line seldom exceeds 20 feet in length, and an SWR of even 4 to 1 adds very little power loss. The only time SWR will indicate a low figure is when the antenna presents a load close to 50 ohms, but many mobile antennas will have a base impedance as low as 15 or 20 ohms at their resonant frequency. In such cases, SWR will indicate 3 or 4 to 1, and yet the system will be radiating efficiently.

The really important factor in your mobile antenna is that it should be carefully tuned to resonance at the desired frequency. The fallacy in using an SWR bridge lies in the fact that it is sometimes possible to reduce the SWR reading by detuning the antenna. Field strength may actually be reduced in an effort to bring SWR down. Since field strength is the primary goal, we recommend a field strength meter for antenna tuning.

For antenna adjustments, the transceiver may be loaded lightly, using the TUNE position instead of operating at full power output. This will limit tube dissipation during adjustments, and will also help to reduce interference on the frequency. In any case, do not leave the transmitter on for very long at one time. Turn it on just long enough to tune and load, and get a field strength reading. Start out with the antenna whip at about the center of its adjustment range. Set the VFO to the desired operating frequency and then adjust the PLATE control for a dip, and then the LOAD control. Then observe the field strength reading. The field strength meter may be set on top of the dash, on the hood, or at an elevated location some distance from the car.

Change the whip length a half inch or so at a time, retune the finals each time, and again check the field strength at the antenna. Continue this procedure until the point of maximum field strength is found. This adjustment will be most critical on 75 meters, somewhat less critical on 40, until on 10 meters the adjustment will be quite broad. After tuning the antenna to resonance, the finals can be loaded to full power.

SECTION 3. CONTROLS AND THEIR FUCTIONS

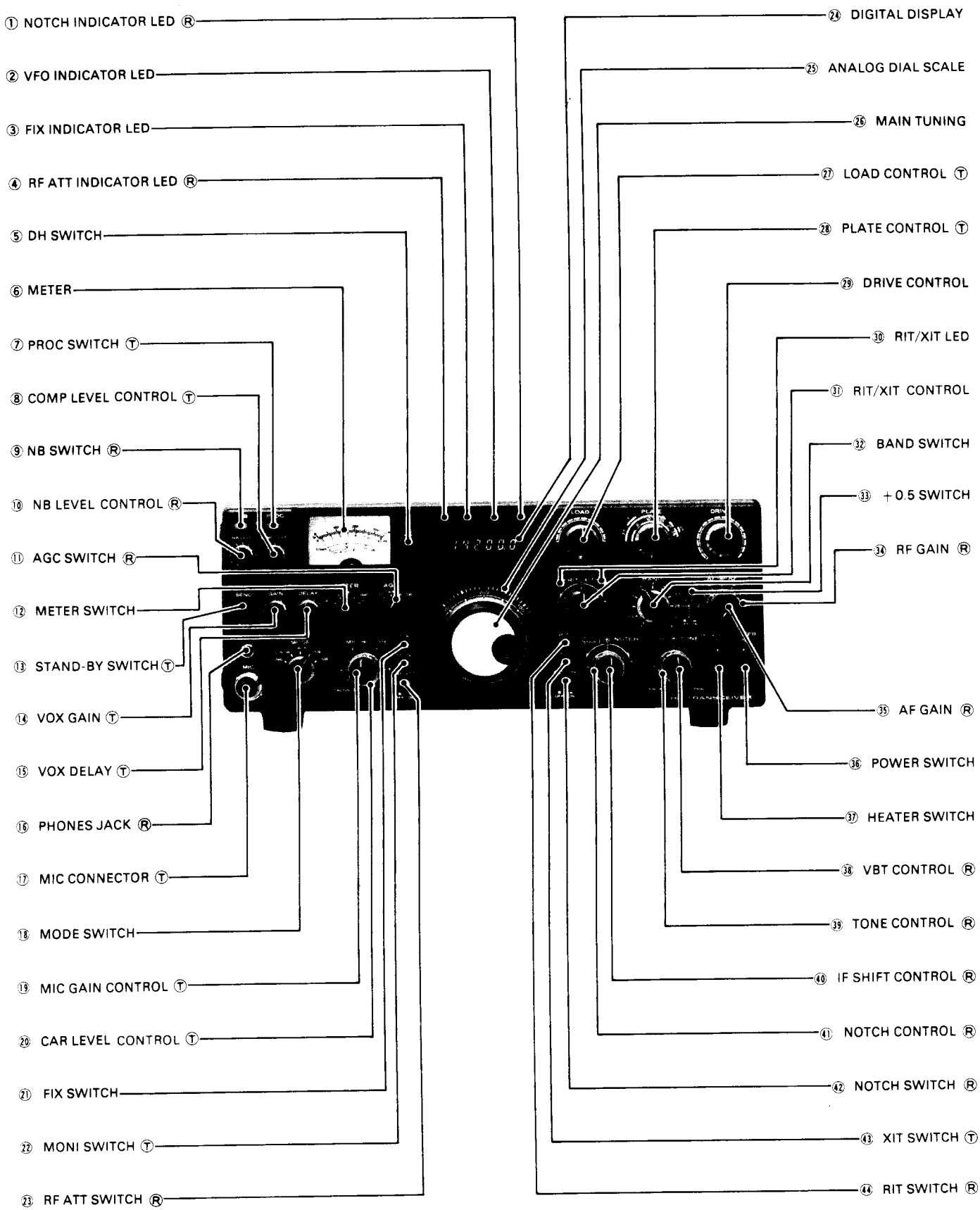

Fig. 3-1 Front Panel View

3.1 FRONT PANEL

The symbol after the part name indicates:
Ⓡ: Active only during reception.
Ⓣ: Active only during transmission
No symbol: Always active

1. NOTCH INDICATOR LED Ⓡ

This indicator, (light emitting diode), illuminates when the NOTCH circuit is turned ON.

2. VFO INDICATOR LED

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

3. FIX (FIXED CHANNEL) INDICATOR LED

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

4. RF ATT INDICATOR LED Ⓡ

This illuminates when the RF ATTENUATOR is turned ON.

5. DH (DISPLAY HOLD) SWITCH

With this switch ON, the display frequency remains ON even if the main tuning is changed. This feature is used to memorize the original frequency when checking another frequency.

6. METER

The meter monitors six different functions, depending on METER switch position. In receive the meter is automatically an S-meter, and shows received signal strength on a scale of 0 to 40 dB over S9. In transmit, meter function depends on the position of the METER switch, as described below. This is an average-responding meter, NOT peak-reading.

7. PROC (SPEECH PROCESSOR) SWITCH Ⓣ

This switch is used during SSB operation. Set the switch to the ON position and the speech processor will be activated, increasing the average talk power. Compression level can be adjusted by the processor control (8).

8. COMP LEVEL CONTROL Ⓣ

This control adjusts compression level. Set the meter switch (12) to the COMP position and adjust this control while observing the meter COMP scale.

9. NB SWITCH Ⓡ

With the push switch, the noise blanker circuit is turned ON reducing pulse-type (ignition) noise. Power-line, radar, QRM and atmospheric "white" noises will not operate the blanker. The noise blanker circuit operating level is adjustable by the noise blanker control (10).

10. NB LEVEL CONTROL Ⓡ

This control adjusts the noise blanker circuit operating level according to receiving conditions or noise level.

11. AGC SWITCH Ⓡ

This controls the AGC (Automatic Gain Control) circuit:
OFF..... AGC disabled (no AGC).
FAST..... Normally used for CW operation.
SLOW..... Normally used for SSB operation.

12. METER SWITCH

This determines the transmit meter function:
ALC (Automatic Level Control)
Monitors internal ALC voltage, or the ALC voltage feedback from a linear amplifier operated in conjunction with the TS-830S. For SSB operation the ALC reading for voice peaks should be within the indicated ALC range. ALC voltage adjustment is made with the MIC control for SSB and with the CAR control for CW.
IP (Plate Current)
In this position the meter monitors final tube plate current. The scale is calibrated from 0 to 350 ma.
RF (Output Power)
This monitors relative output power of the transceiver. There is no meter scale for this position. Normally the reading should be adjusted (with the RF METER control) for a 2/3 scale reading.
COMP
This indicates compression level when the speech processor is operating.
HV (High Voltage)
This position monitors the high voltage power supply. The meter scale is calibrated from 0 to 10, indicating 0 to 1000 volts.

13. STAND-BY SWITCH Ⓣ

This two-position lever switch selects:
REC ..... The transceiver is receiving unless the microphone PTT switch, or the VOX circuit is activated.

SEND..... Locks the unit in transmit.

14. VOX GAIN Ⓣ

This controls sensitivity of the VOX (Voice Operated Transmit) circuit.

15. VOX DELAY CONTROL Ⓣ

The DELAY control adjusts the hold time for VOX or break-in CW operation. Adjust for individual preference.

16. PHONES JACK Ⓡ

The headphones jack allows use of a 4 to 16 ohm headphone through a 1/4" phone plug. When phones are used the speaker is disconnected.

17. MIC CONNECTOR Ⓣ

The four pin connector allows use of a microphone with PTT. Figure 2-1 shows plug wiring.

18. MODE SWITCH

The mode switch selects type of emission, and TUNE.

TUNE ..... This position provides reduced carrier and shorted key line for transceiver tuning. (Input power to the final section is reduced to prevent tube damage during tune-up.)
Frequency is shifted approximately +800Hz from the USB or CW receive frequency. This is the actual CW transmit offset. This feature allows you to Zero-Beat an incoming CW signal.

CW.W ..... Used for CW operation. A high-cut filter is inserted in the receiver audio circuit to reduce unwanted noise.
SSB filter selected for WIDE receive bandwidth.

CW.N ..... (NARROW) Used for CW operation with CW filters YK-88C (500 Hz), YK-88CN (270 Hz), YG-455C (500 Hz) or YG-455CN (250 Hz), which are available as optional accessories. Without an optional CW filter installed, the pass-bandwidth is the same as in CW.W.

USB ..... Used for upper-sideband operation. International Amateur practice dictates the use of USB on and above the 10 MHz band.

LSB ..... Selects lower-sideband. International Amateur practice dicates the use of LSB on and below the 7 MHz band.

19. MIC GAIN CONTROL Ⓣ

This control adjusts microphone amplifier gain for SSB operation. Adjust for an on-scale ALC reading on voice peaks.
In the CAL ON position, receive frequency can be calibrated at 25 kHz intervals using the built-in oscillator.

20. CAR LEVEL CONTROL Ⓣ

This controls carrier level during CW operation. Adjust for approximately the center of the ALC meter reading.

21. FIX SWITCH

Place this switch ON for fixed channel operation;
(an optional crystal is required. Trio-Kenwood does not supply these crystals.)

22. MONI (MONITOR) SWITCH Ⓣ

This delivers a sample of the demodulated transmit IF signal to the AF for monitoring modulation.

23. RF ATT 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. DIGITAL DISPLAY

The digital display indicates operating frequency to the nearest 100 Hz.

25. ANALOG DIAL SCALE

The mono-scale permits direct analog frequency readout over the 0 to 500 kHz range, graduated at 1-kHz intervals. Operating frequency equals the dial (in kHz) plus the BAND switch frequency (in MHz). An additional 50 kHz both above and below the 500 kHz range is also covered.

26. MAIN TUNING

This controls the VFO, selecting the transceiver's operating frequency. The indented knob is convenient for quick tuning.

27. LOAD CONTROL Ⓣ

This controls the loading of the network between the final section and the antenna. Adjustment is described in Section 4.

28. PLATE CONTROL Ⓣ

This controls the plate tuning of the final amplifiers. Calibration is approximate.