FEDERAL COMMUNICATIONS COMMISSIONS REQUIREMENTS

Your new Midland 13-894 is a combination receiver-transmitter designed and built for licensed Class D operation on any of the 23 frequencies designated as citizens band channels by the Federal Communications Commission. You are required to read and understand Part 95 of the F.C.C. rules and regulations prior to operation of this unit. Part 95 regulations are available for $2.00 from the Superintendent of Documents, Government Printing Office. Washington. D.C. 20402. You are also required to complete F.C.C. form 505 and submit it to the F.C.C. in order to receive your license to operate this unit. F.C.C. regulations will be violated if you transmit with this unit prior to receipt of your license.

NOTE

The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the users responsibility to see that this unit is operating at all times in accordance with the F.C.C. Citizens Radio Service regulations.

If you install or service your own transceiver, do not attempt to make any transmitter tuning adjustment. Transmitter adjustments are prohibited by the F.C.C. unless you hold a first or second class radiotelephone license or are in the presence of a person holding such a license. A Citizens Band or Amateur license is not sufficient.

MIDLAND ELECTRONICS COMPANY HEREBY
CERTIFIES THAT THIS UNIT HAS BEEN DESIGNED
AND MANUFACTURED IN ACCORDANCE WITH VOL. 6,
PART 95 OF THE CURRENT FCC RULES AND REGULATIONS
AS OF THE DATE OF MANUFACTURE.

OWNER'S GUIDE

Your new 13-894 is very compact, versatile, professional quality transceiver and we suggest that you read this Owner's Guide carefully before operation so that you can use this transceiver correctly enjoying its many features.

SINGLE SIDEBAND

SSB (Single Sideband) is relatively new in Citizens Band Communications but has been highly effective in commercial, amateur and military usage for many years. It is a superior means of wireless communications allowing transmission of greater distance with a minimum amount of interference and noise.

There are two types of single sideband transmissions, USB (Upper Sideband) and LSB (Lower Sideband). These might be described as half signals and due to the narrow band-width required, will travel over greater distance at lower power than ordinary AM signals. Figure 1 below illustrates USB and LSB signals and the reference carrier line.

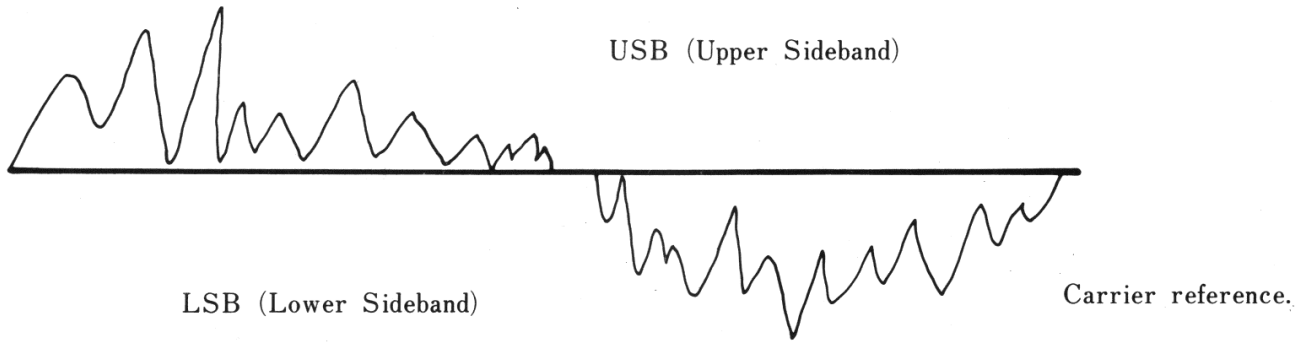


Figure 1.

In the actual transmission of either USB or LSB, the carrier is removed. All of the modulations for transmission is concentrated in either the Upper or Lower Sideband. In the receiver, the carrier is reconstructed and the intelligence or modulated voice is then detected, amplified and converted into an audible sound heard at the speaker.

AM (Amplitude Modulation) has been the standard mothod of Citizens Band B reception and transmission for many years and most of the existing transceivers being used today are AM. Technically, Amplitude Modulation is Double positive and negative sides as represented by Figure 2.

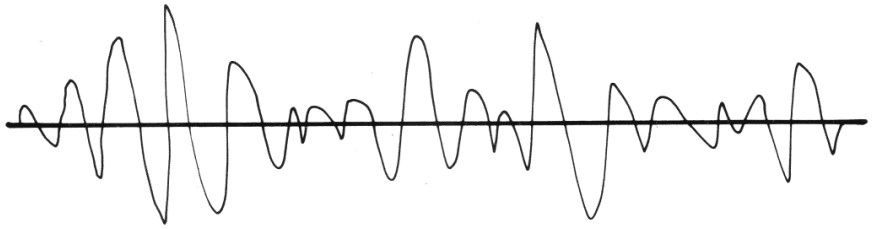
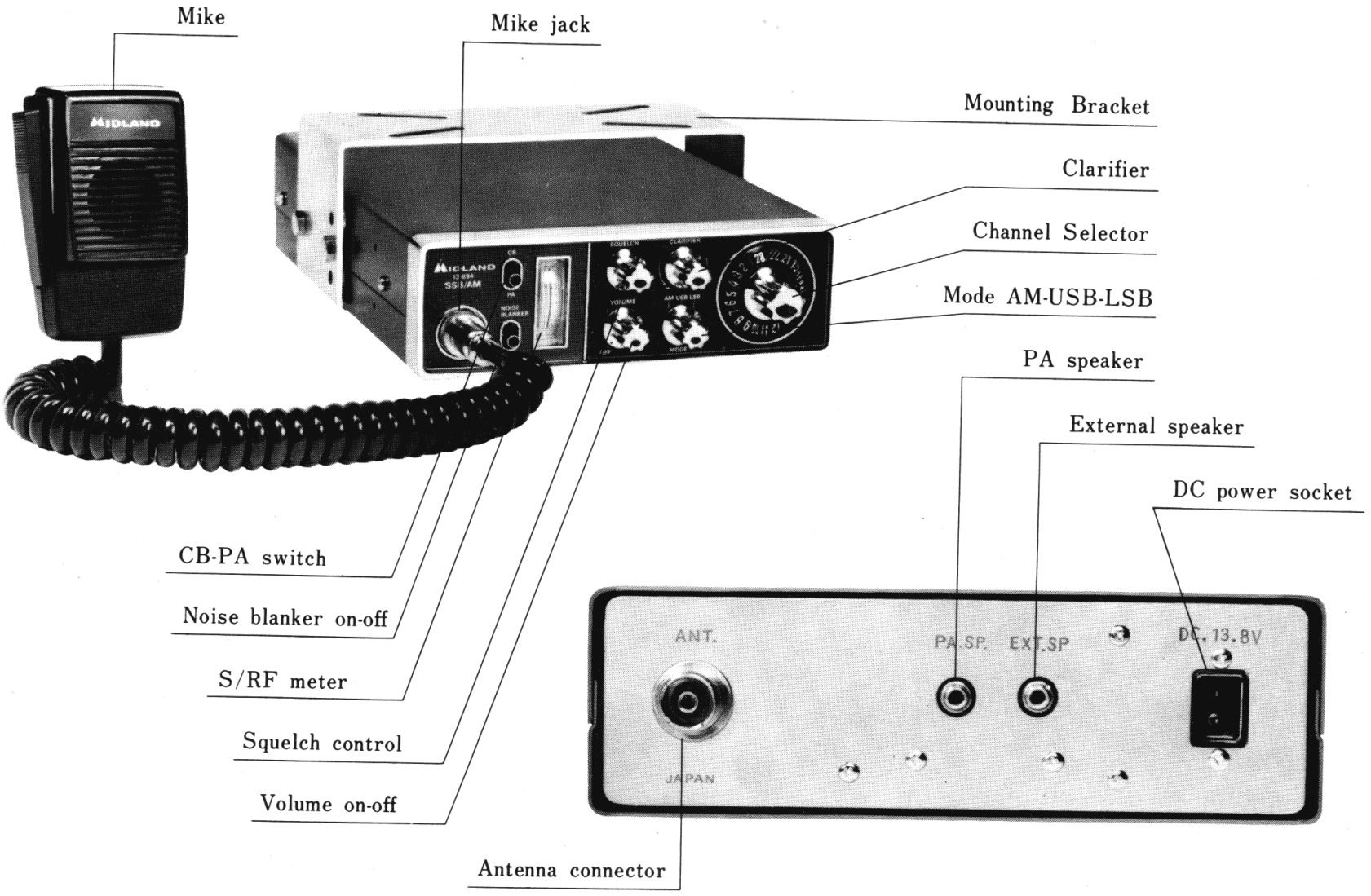


Figure 2.

COMPATIBILITY

The Model 13-894 is designed to be completely compatible with all current modes of Class D operation, including single sideband, (upper or lower), double sideband, or conventional AM and is equipped with separate transmitter circuitry to provide high level AM (Amplitude Modulation) transmissions and True SSB (Single Sideband) transmissions. The receiver section is also capable of receiving AM and SSB. The mode of operation for both receiver and transmitter sections is automatically selected by the mode selector switch.

OPERATION OF CONTROLS



CHANNEL SELECTOR DIAL

Controls both transmitter and receiver frequencies simultaneously and may be set to any of the 23 positions indicated. All necessary crystals for full 23 channels operation are factory installed.

VOLUME/ON-OFF

Turns the set on and controls the sound output from the speaker when receiving. The volume control does not affect transmitting output.

SQUELCH

Quiets the receiver when signals are not being received and allows a quiet standby operation. It functions only in the receive mode and does not affect the receiver volume when signals are being received. To adjust; When no signals are present, rotate the squelch control clockwise until the receiver is quieted. Incoming signals will automatically release the squelch.

In the AM mode, the squelch is operated by the continuous carrier of the received signal. Therefore, it operates positively according to the presence of an incoming signal.

In SSB operation, however, the voice composition determines the intensity of the signal. When a signal is received, the voltage is held for 1-2 seconds in the circuit, then the squelch will open and you will hear the signal. When the signal stops, the squelch will remain open for 1-2 seconds before quieting the receiver. This is normal operation.

MODE SWITCH

Controls the mode of operation for the transmitter and receiver simultaneously and allows selection of conventional AM operation or SSB operation on either upper or lower sideband. In order to communicate with another transceiver, you must use the same operating mode.

CLARIFIER

Allows a slight variation of transmit and receive frequency above and below the actual channel frequency. This operation is similar to a fine tuning control and while it is primarily intended for SSB operation, it also allows precise adjustment in the AM mode. The setting of this control is somewhat critical in the SSB mode and if it is not properly adjusted, the signals you receive will be distorted.

NOISE BLANKER

This switch activates a very effective type of noise elimination circuit. Generally in mobile use, the noise blanker is usually left on due to the higher noise levels encountered. In base station operation, the individual situation determines the need.

PA-CB

The Model 13-894 may also be used as a P.A. (Public Address) amplifier. Connect a suitable 8 or 16 ohms PA speaker to the proper rear panel jack, place the PA-CB switch in the PA position and press the push-to-talk button on the microphone. For regular 2-way communications, the switch must be set to the CB position.

EXTERNAL SPEAKER JACK

An external speaker may be used by connecting a suitable 8-16 ohms speaker +0 a standard 3.5 mm 2-circuit phone plug. When the plug is inserted into the external speaker jack, the built-in speaker is automatically disconnected.

SIGNAL-POWER METER

A combination meter on front panel provides a constant visual monitor of incoming "Signal Strength" when receiving and "Relative Output Power" when transmitting. When transmitting by pressing the push-to-talk button on the microphone, the meter lights up in red indicating the transceiver is in transmitting.

POWER SUPPLY

The Model 13-894 is designed to operate on 12 volts DC. Any 12-volt (negative ground) automobile system is adequate. For base station application, a base station power supply, which plugs into 110 volts AC and delivers 12 volts DC to your transceiver, may be used.

CAUTION: Red wire from the Model 13-894 is positive and may be connected directly to the positive or + battery terminal or to a fuse block or ignition switch or other convenient point.

Black wire is negative or ground and should be connected to a metal part of the vehicle body or frame or −battery terminal.

To ensure proper operation, care should also be taken in attaching the transceiver and mounting bracket to the vehicle in such a way as to obtain good ground connection at this point.

MOBILE ANTENNAS

A vertical whip antenna is best suitable for mobile operation. A nondirectional antenna should be used for the best results in any case. The base-loaded whip antenna will normally provide effective communication or for greater range and more reliable operation a full quarter-wave whip may be used. Either of these antennas use the metal car body as a ground plane and the shield of the base lead as well as the metal case of the transceiver should be grounded. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 coax plug. Following the antenna manufacturer's instructions carefully will ensure proper operation.

Whatever the type of antenna selected, it is important that it be properly adjusted and matched and the connecting transmission line be in good condition so as to avoid a high VSWR (voltage standing wave ratio). A VSWR over 2 to 1 results in reduced radiated power and may cause instability and damage to the final output stage of the transceiver. The VSWR may be measured with any one of several inexpensive VSWR bridges that are available.

OPERATING INSTRUCTIONS

1. Plug in the microphone and check to be sure that the antenna and power cables are properly connected.
   CAUTION; Do not transmit until an antenna or suitable dummy load has been connected to the coax antenna output jack.

2. Turn the set on and adjust the volume to the desired level.

3. Set the channel selector to the desired channel.

4. Adjust the squelch control.

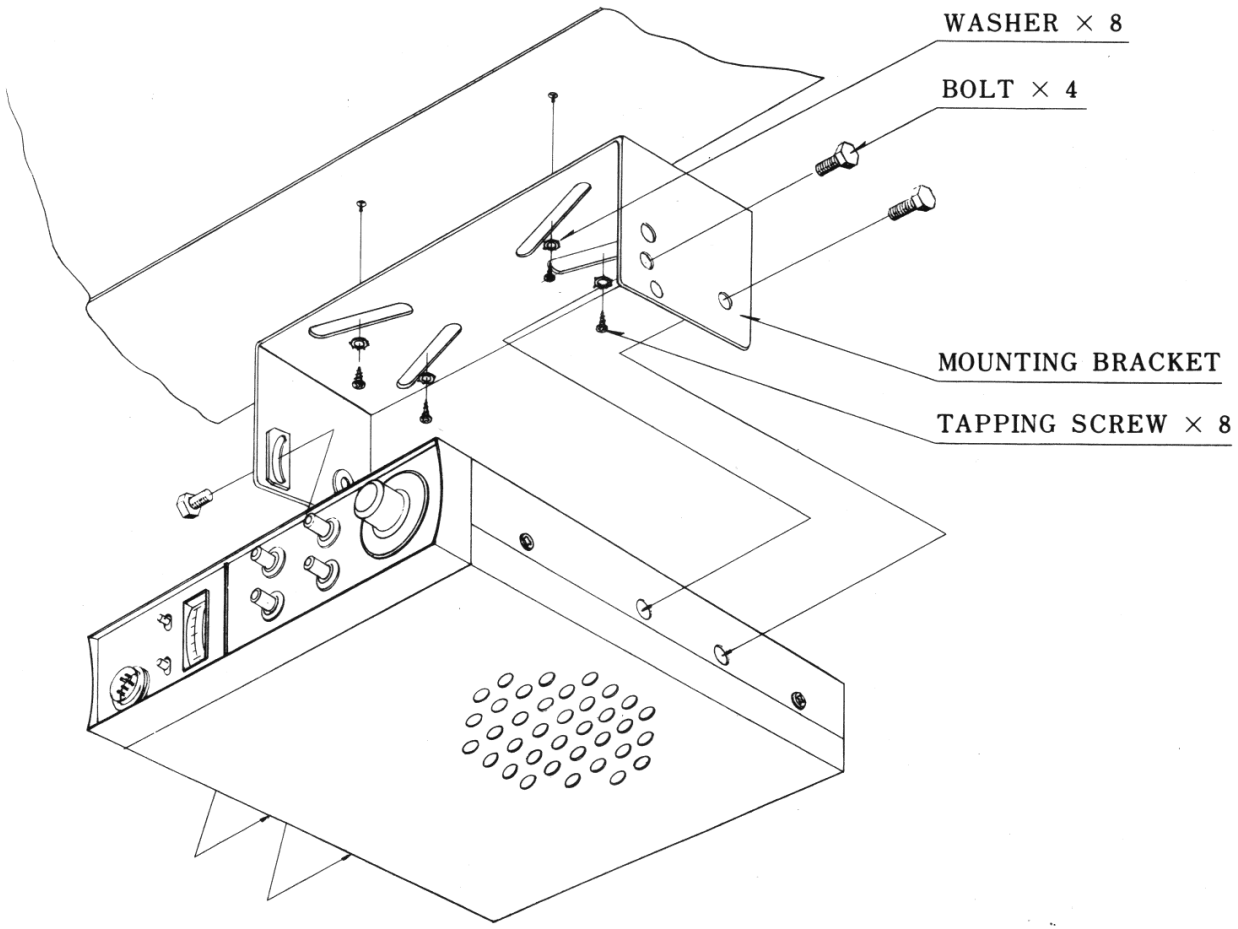
5. Set the mode switch to the desired mode.

6. Make sure the PA-CB switch is set to the CB position.

7. Adjust the clarifier control for the clearest reception of the desired signal.

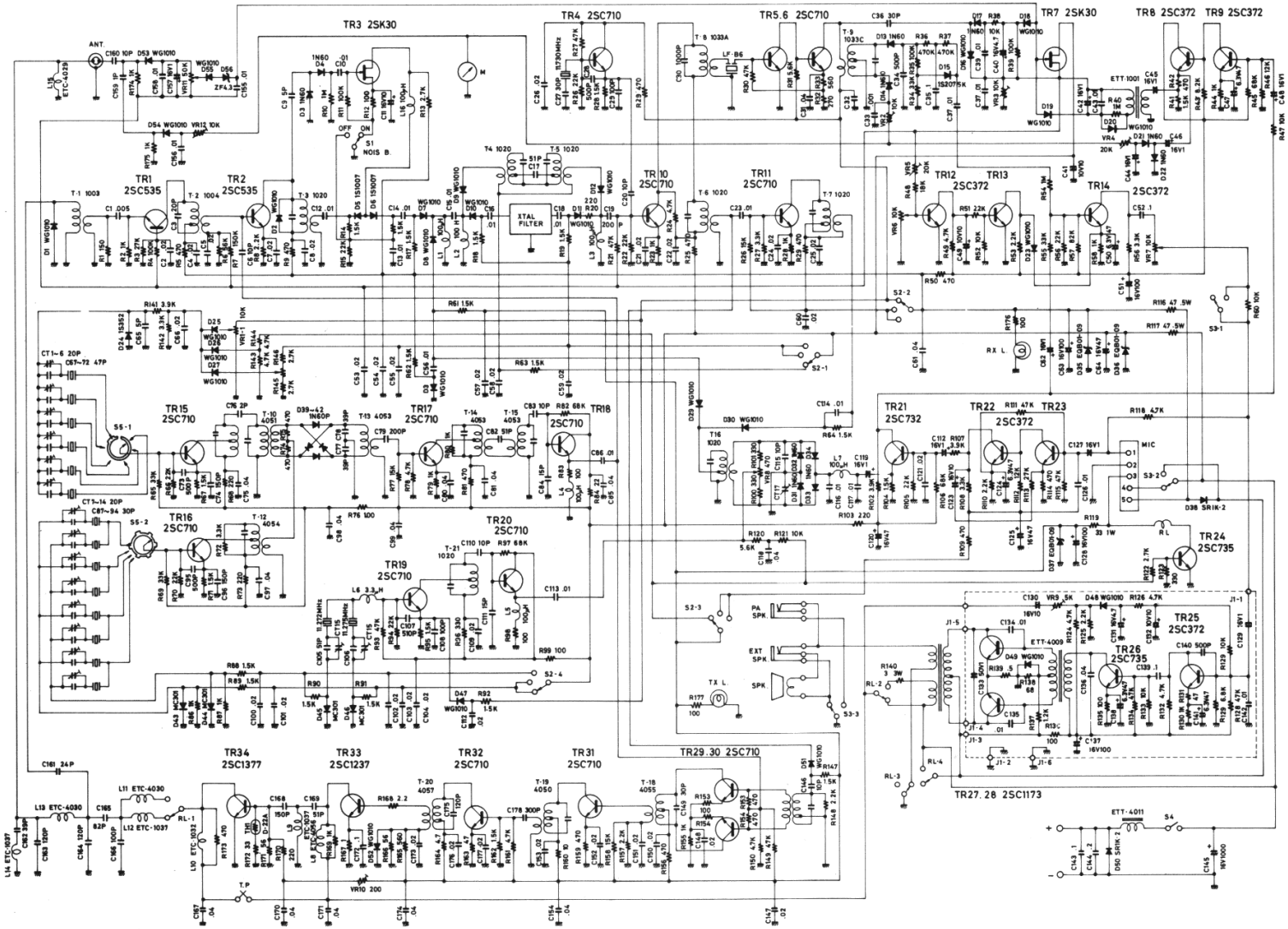
8. To transmit, press and hold the push-to-talk switch on the microphone. Hold the microphone 2 to 3 inches from your mouth and speak in a normal tone of voice. To receive, release the push-to-talk switch.

MOUNTING INSTRUCTIONS



Safety and operating convenience are the primary factors to be considered when mounting any piece of equipment in an automabile. Be sure that the transceiver controls may be easily reached by the operator. Also be sure that connecting cables do not interfere the operation of the brake, accelerator, etc.

MODEL 13-894 SCHEMATIC DIAGRAM



MODEL 13-894 SPECIFICATIONS

GENERAL

Circuitry:	32-Transistor, 2-FET, 57-Diode.
Frequency Control:	Crystals.
Channels:	23
Modes of Operation:	AM, Lower Sideband-Upper Sideband.
Controls:	Volume-on/off, variable squelch, mode selector, SSB clarifier, PA-CB switch automatic noise blanker switch, illuminated channel selector.
Jacks and connections:	Microphone, antenna, PA speaker, external speaker and rear-mounted DC power cable.
Power source:	12 volts DC.
Speaker:	2-3/4" dynamic, 8 ohms.
Microphone:	Dynamic CB mike.
PA Audio Output:	More than 3.5W
Size:	2-1/4" (H) × 7-1/8" (W) × 9-1/4" (D).
Weight:	5.4 Lbs.
Accessaries:	12 volts DC power cord, microphone, mike hanger and mounting bracket with hardwares.
Receiving system:	Dual conversion superheterodyne.
Sensitivity:	More than 0.5μV (S/N 10dB)
Selectivity:	More than 50dB
Clarifier:	More than ±500Hz
Audio output power:	More than 4W
Squelch range:	0.5μV～500μV
Intermediate Frequency:	1st, 11.2735 MHz. 2nd 455KHz

SSB TRANSMITTER

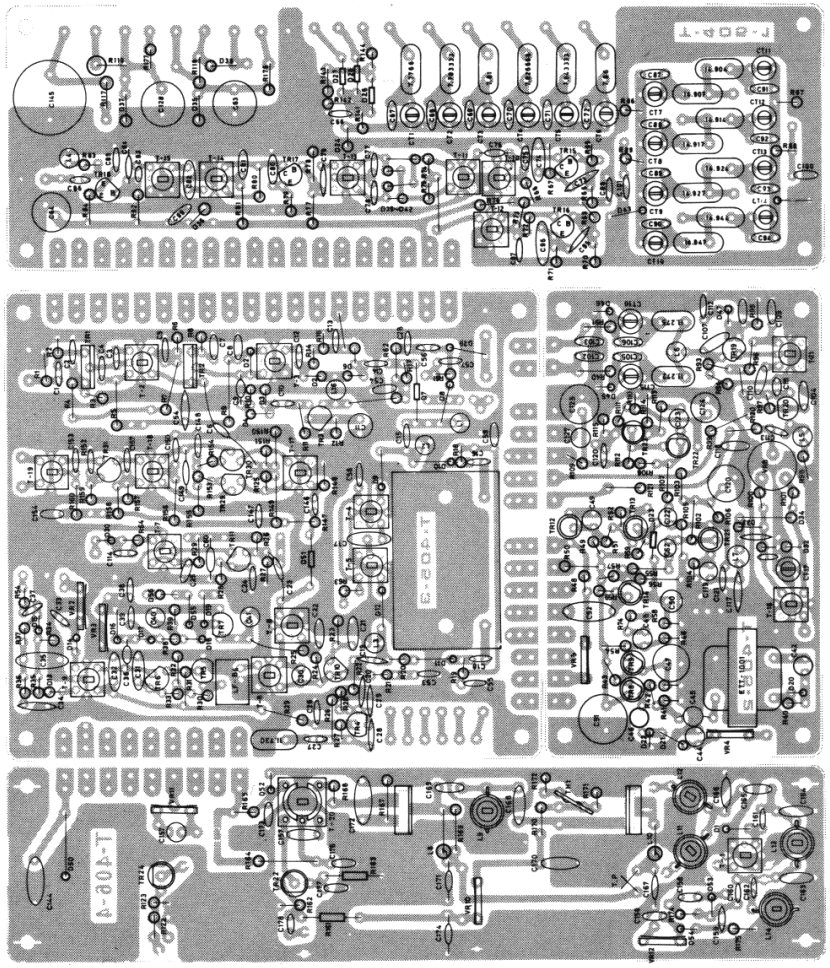
SSB Generation:	Balance Modulation
Frequency Response:	300～2700Hz
RF Input Power:	15W
Carrier Suppression:	More than 40dB
Unwanted Sideband Suppression:	More than 50dB
Harmonic Suppression:	More than 50dB

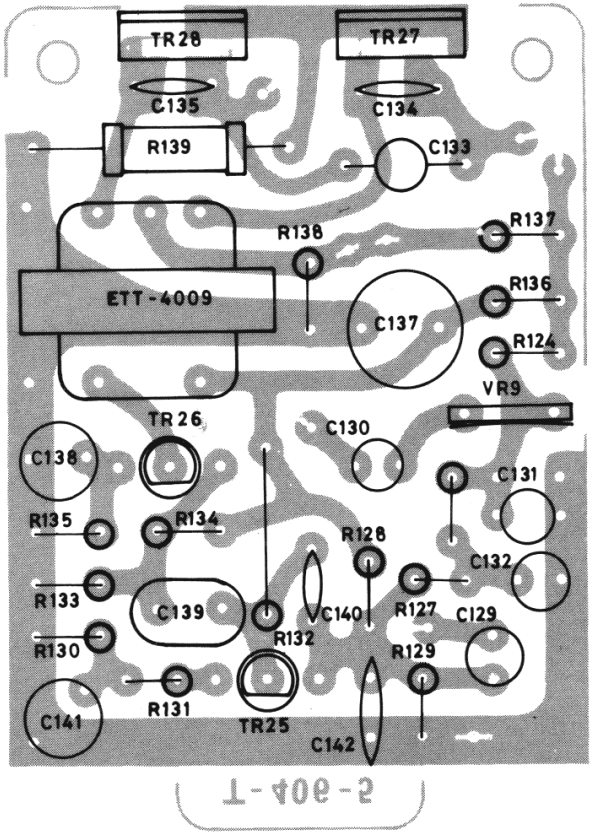
AM TRANSMITTER

Modulation:	High Level Class B
RF Input Power:	5W
RF Output Power:	More than 3W
Harmonic Suppression:	More than 50dB

MODEL 13-894 PARTS LAYOUT

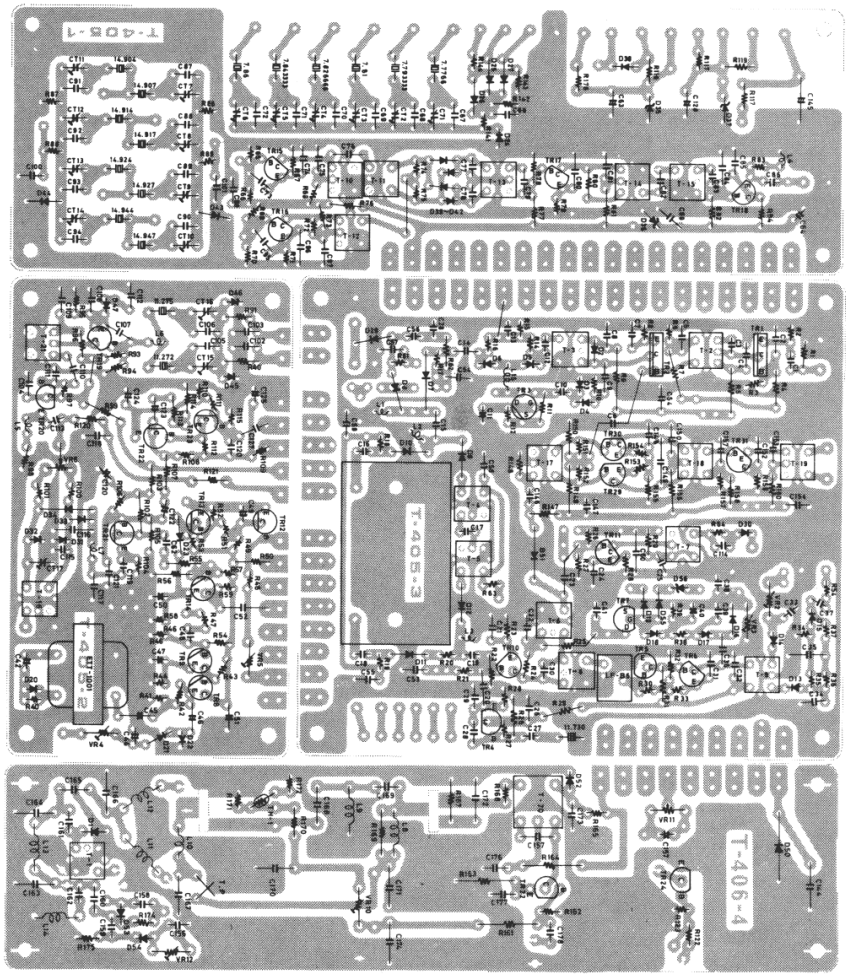
FRONT VIEW

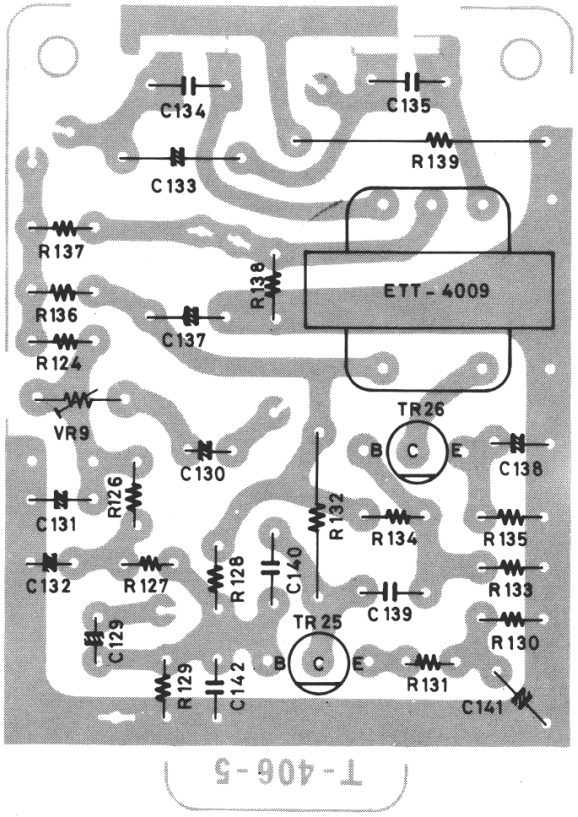




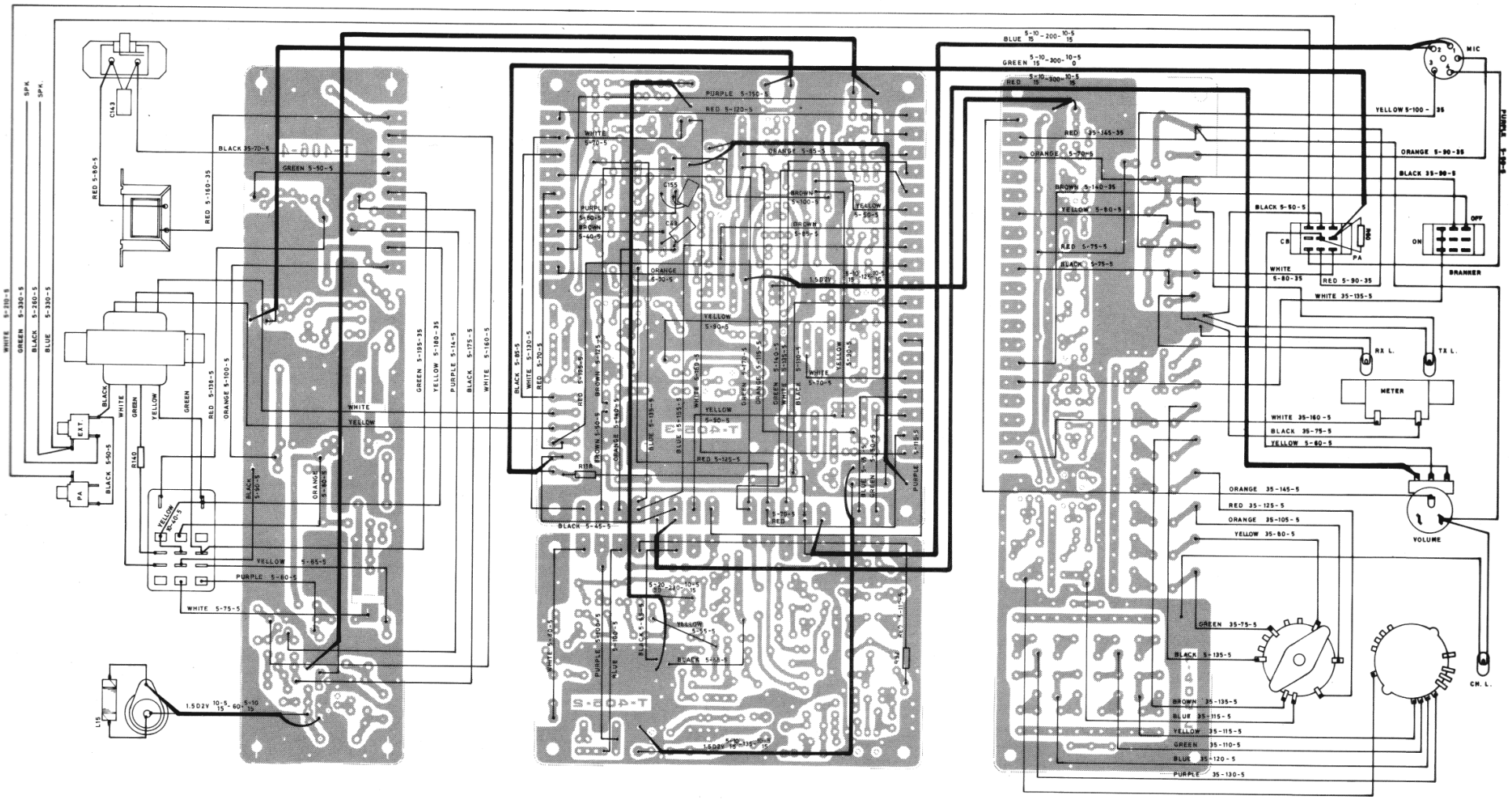
MODEL 13-894 PARTS LAYOUT

BACK VIEW





MODEL 13-894 WIRING DIAGRAM



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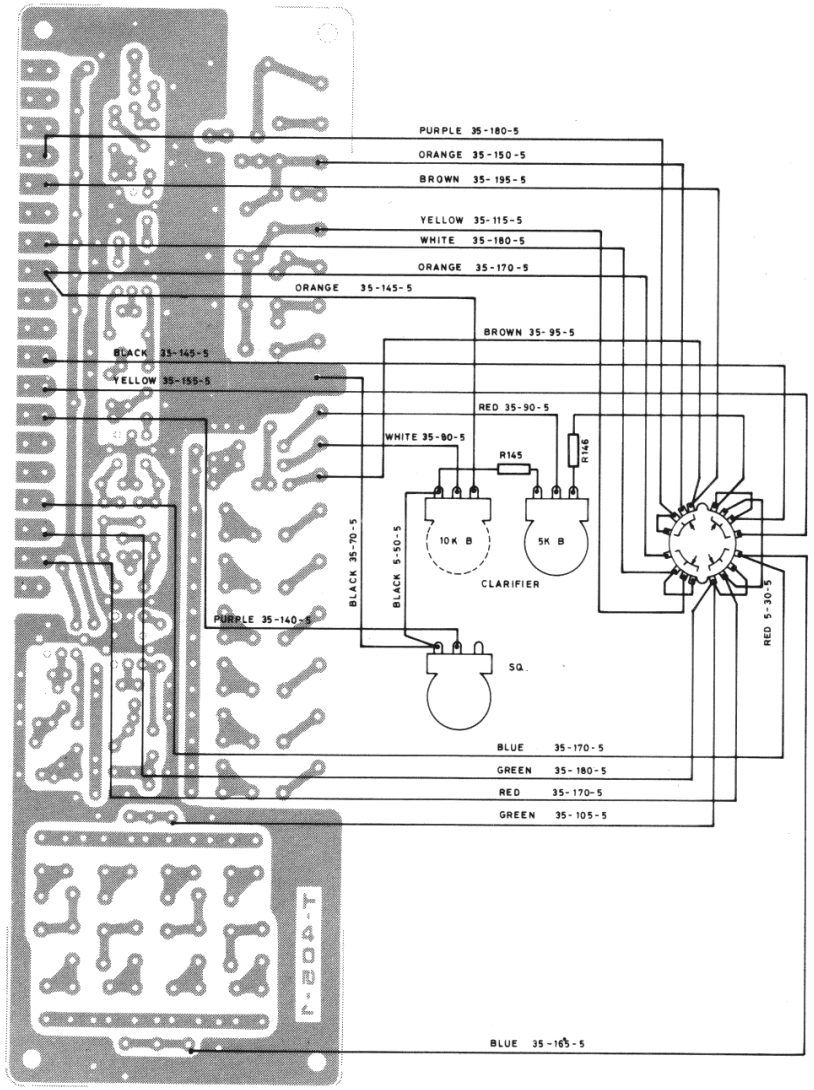

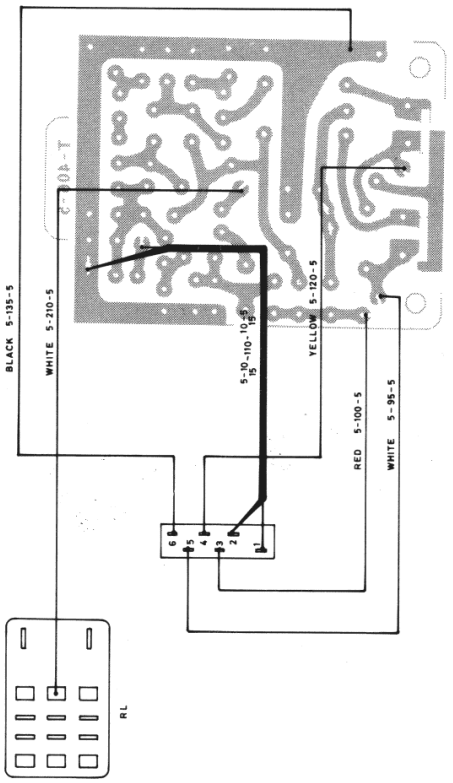

MEMO

MEMO

WARRANTY POLICY

Midland Electronics Company warrants each new Midland product to be free from defects in material and workmanship under normal use and service for a period of 90 days after delivery to the ultimate user and will replace or repair the product at our option, at no charge should it become defective and which our examination shall disclose to be defective and under warranty.

This warranty shall not apply to any Midland product which has been subject to misuse, neglect, accident, incorrect wiring not of our own installation, or to use in violation of instructions furnished by us, nor extended to units which have been repaired or altered outside of our factory.

This warranty does not cover carrying cases, earphones, batteries, antenna, broken or cracked cabinets, or any other accessory used in connection with this product.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

Sales receipt must accompany product to validate the date of purchase.

Midland Electronics Company

North Kansas City, Missouri 64116