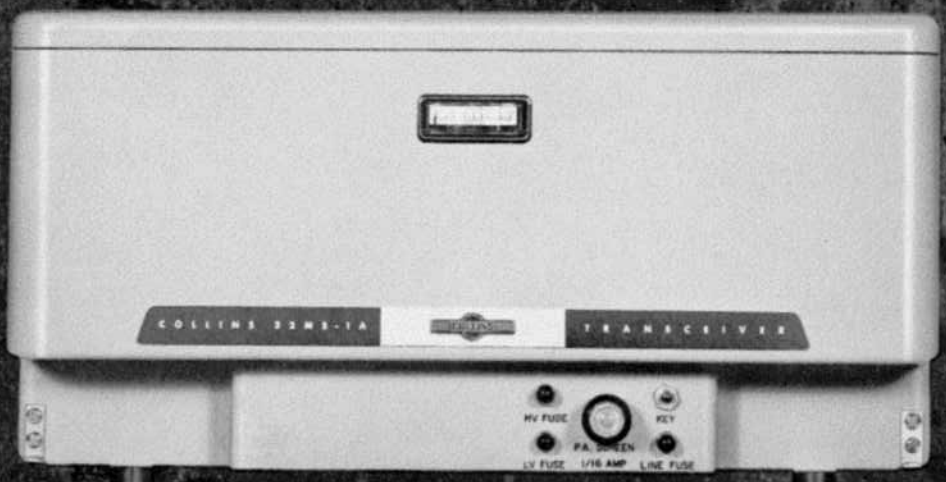
COLLINS

32MS-1A

Mobile

SINGLE SIDEBAND
TRANSCEIVER



COLLINS 32MS-1A Mobile SSB TRANSCEIVER

The 32MS-1A offers the mobile operator increased communication ability and talking power with reduced bandwidth, improved speech intelligibility and lower primary power drain.

The 32MS-1A and its associated accessory equipment permits a choice of either single sideband or compatible AM emission and reception on any of four preset frequencies in the 1.6-15.0 mc range. All operating functions including channel selection are controlled by pushbuttons on the separate control unit. Control units are available for fixed as well as mobile use.

The 32MS-1A 100 watt PEP SSB system offers greater effective talking power for a specific power consumption than standard AM equipment of 200 watt rating under normal operating conditions. In addition, lower susceptibility to selective fading, increased spectrum conservation and higher frequency stability are basic characteristics of SSB installations.

Plug-in power supplies provide for operation from either 12 v dc, 28 v dc, or 115/230 v ac, 50-400 cps single phase power sources, and permit use of the 32MS-1A as the basic equipment for land or maritime mobile and fixed station use.

CIRCUITRY

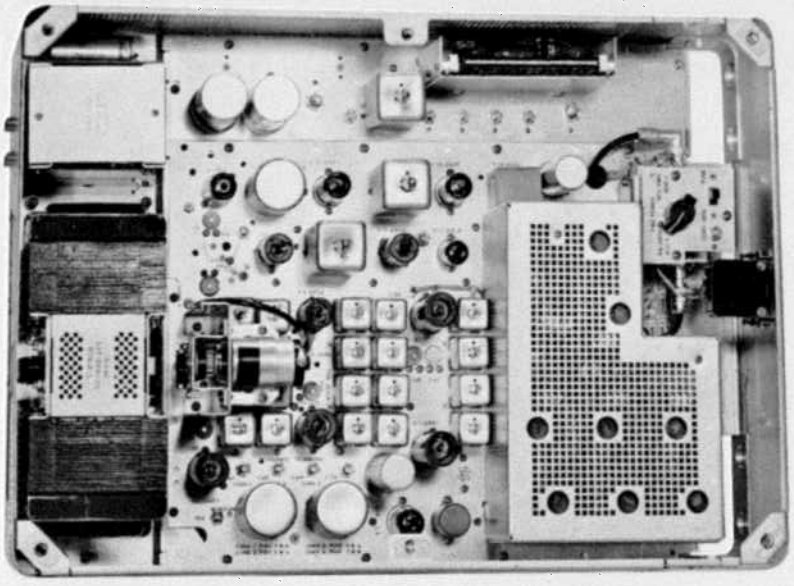
In the SSB transmit function an audio signal from the control unit handset passes through the audio amplifier and is mixed with a locally generated 455 kc crystal-controlled carrier signal in the balanced diode ring modulator to produce a double sideband suppressed carrier signal. The lower sideband is selected by a Collins Mechanical Filter and fed to the tube type balanced mixer. A locally generated crystal-controlled signal is also fed to this mixer. The mixing action translates the input lower sideband signal to the assigned frequency as either a lower or upper sideband signal. This sideband signal is raised to rated PEP level in the highly linear amplifier, driver and power amplifier stages. Each amplifier uses separate sets of coils on each channel to provide optimum selectivity. The power amplifier uses separate highly efficient pi-L networks as final tank, output and matching networks. The output impedance is a nominal 52 ohms, unbalanced. Each channel provided covers the entire 1.6-15.0 mc range when equipped with the appropriate coils. Consequently no restriction in channel assignment is necessary, and channels can be preassigned to either upper or lower sideband use without additional switching. The upper sideband mode is recommended for most installations. AM transmit operation is similar to SSB except some of the 455 kc signal is shunted around the balanced modulator and Mechanical Filter by the carrier re-insertion circuitry. This signal along with the normal sideband input is translated by the balanced mixer and channel oscillator to the assigned frequency band. The RF emission during AM operation consists of the sideband and re-inserted carrier.

The 32MS-1A input audio circuitry includes a speech clipping circuit operating on both positive and negative peaks to provide increased effective modulation. The clipper threshold is −3 dbm on AM and +3 dbm on SSB. Both RF feedback and Automatic Load Control are used in the RF amplifier section to insure good linearity and reduced distortion.

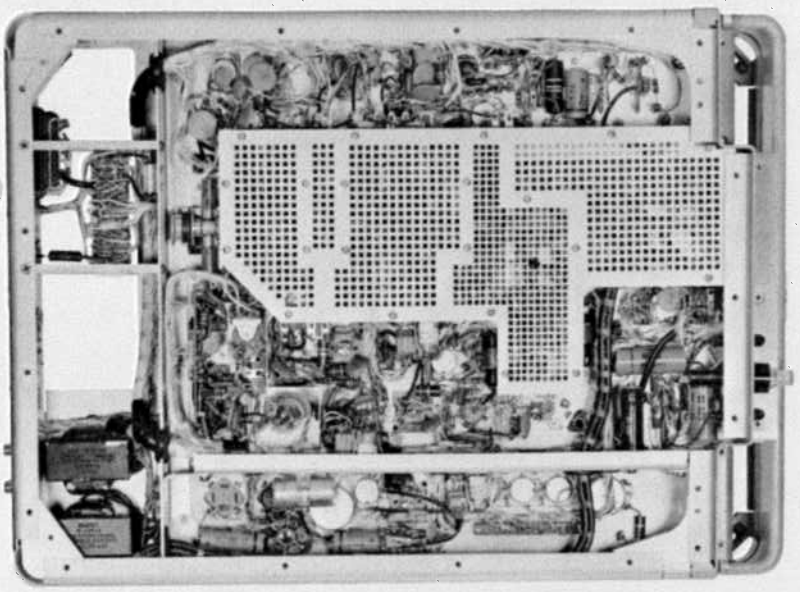
In SSB reception, a signal from the antenna is fed through two tuned circuits to the RF amplifier, through two additional tuned circuits and then applied to the mixer. Circuit merit factors are high and the RF levels are chosen to yield the required sensitivity with good cross-modulation characteristics.

The incoming signal is converted in the mixer to the IF frequency by the action of the crystal-controlled channel oscillator. It then passes through the Mechanical Filter and into two IF amplifier stages. The IF signal is then applied to the twin triode product detector and the AVC rectifier. The local 455 kc crystal-controlled oscillator provides the mixing signal for product detector action. The audio output is then amplified and fed to the control unit.

In AM reception, operation is similar to SSB, except



The top cover may be removed without the use of tools permitting complete access to all tubes and tuning adjustments. Shields protect the technician from direct exposure to high voltage.



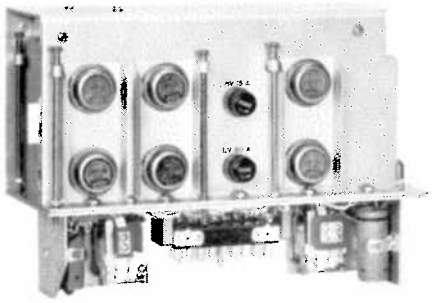
All wiring and components are easily accessible from the bottom of the transceiver unit to facilitate inspection and maintenance procedures.

that the Mechanical Filter is replaced by an intermediate frequency transformer and a diode detector is used instead of the product detector.

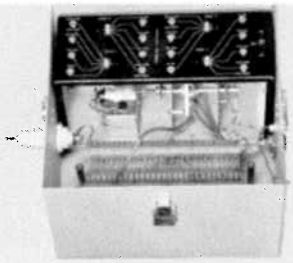
The 32MS-1A is housed in a welded aluminum case. Cooling is by convection, with air entering through perforations in the bottom cover and flowing out through openings in the side of the cabinet. When transmitting, a blower forces air directly on the PA tubes and effects general air circulation throughout the cabinet. Additional forced air may be employed in accordance with ARINC standards in installations where normal ambient air circulation is restricted.

All tubes and controls for initial adjustments and tuning are easily reached by removing the top and bottom cover. The tune-up procedure is straightforward. All tuning adjustments are continuous, and the technician is not directly exposed to high voltage while maintaining the equipment. High stability frequency generation circuits are common to the transmitter and receiver sections to simplify over-all circuitry and operation and to insure transmission and reception of signals on identical frequencies.

The transceiver together with control unit, antenna tuner and associated antenna comprise an easily installed system. All system electrical interconnections are effected by plugs or cable connectors.

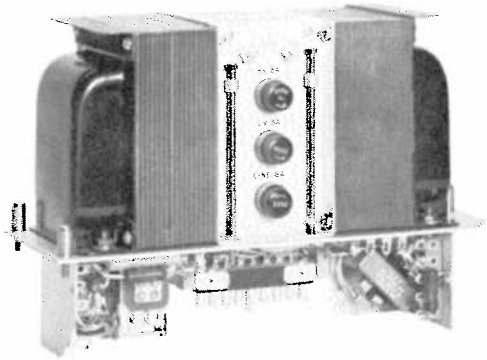


Mobile operation is facilitated by a plug-in dc power supply.



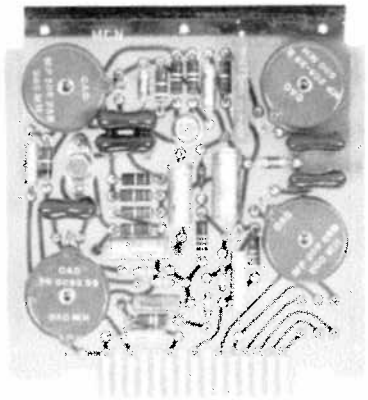
180V-2 Antenna Coupler

180K-3 Antenna Coupler

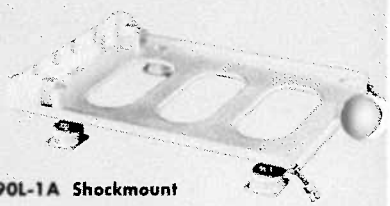


The compact ac power supply operates from 115 v or 230 v, 50-400 cps sources.

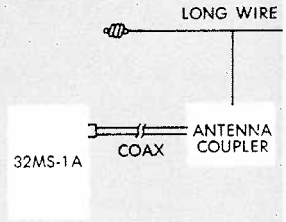
180L-3 Antenna Coupler

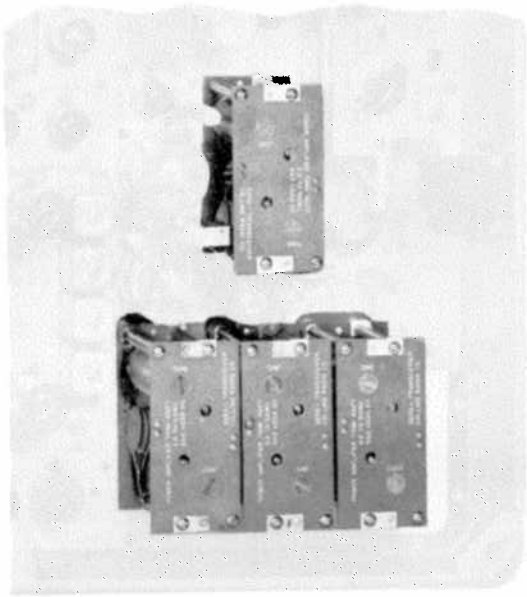


An improved automatic gain control circuit operates on noise rather than voice modulation. AGC line control voltage is derived from noise at 2650 cps and voice audio power peaking at approximately 800 cps has little effect on the long term dc control voltage.



390L-1A Shockmount





Final amplifier plug-in tank assemblies may be tuned individually to any frequency within the range.