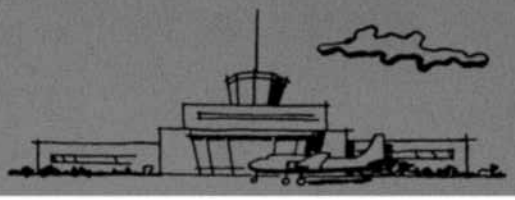
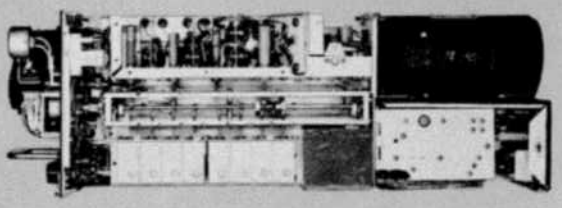
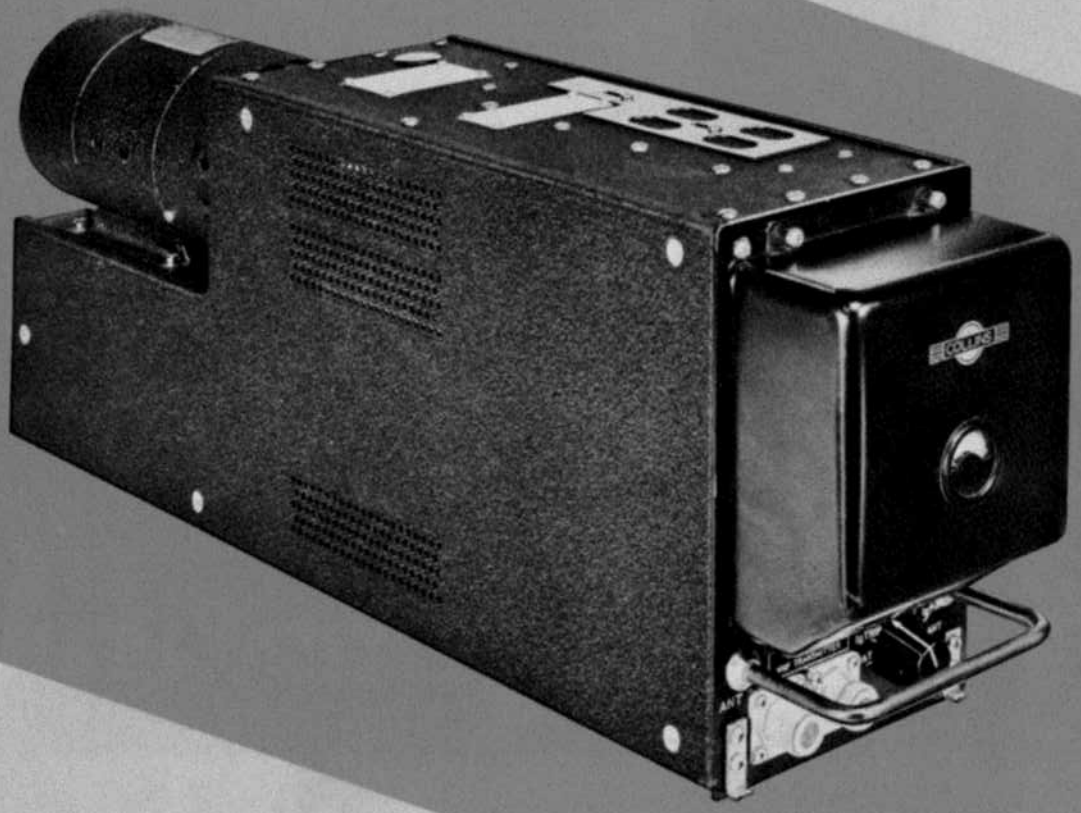
17L-4
TRANSMITTER

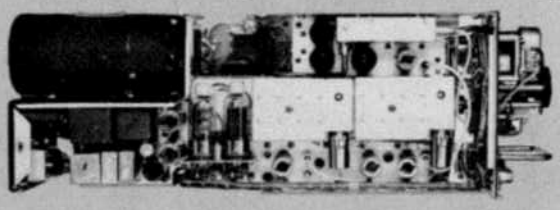
Collins 17L-4
VHF TRANSMITTER





17L-4 RIGHT SIDE COVER REMOVED





17L-4 LEFT SIDE COVER REMOVED

25 watt, 360 channel, 1/2 ATR VHF transmitter

Collins 17L Transmitter provides transmitting facilities on all channels reserved for aircraft communication in the VHF band. Its frequency range is 118.0 to 135.95 megacycles, and all of the 360 channels assigned in this range are easily selectable over a simple and positive remote control system. The power output, on radiotelephone, is conservatively rated at 25 watts, thus assuring that transmissions will be received and acknowledged at the busiest air terminals.

Light weight and small (only 1/2 ATR case), the compact 17L assembly provides easy accessibility to all components for servicing. Removable side-covers permit quick checking of tubes, crystals, and moving mechanical parts. By releasing the top and bottom of the wrap-around, the components of the frequency generator and the R. F. amplifier section are easily reached. For extensive repair and servicing, the R. F. amplifier unit, frequency generator, two crystal oscillator units, and the front panel may be removed completely.

Collins 17L-4 is designed to meet electrical requirements of ARINC Spec. 520. The total of 360 channels available are furnished by a crystal saving system employing two banks of crystals. The output of the two oscillators is filtered to remove undesired harmonics, then mixed. After mixing it is passed through a selective amplifier system to remove undesired mixer products, then tripled. Two well isolated stages, a pre-amplifier and a driver stage bring the level up to produce ample drive for the Final Amplifier.

The frequency determining crystals are selected by remotely controlled Autopositioner* units. The unit selecting the megacycle determining crystal also operates the mechanism which tunes the mixer, multiplier, pre-amplifier, and power amplifier circuits. Remote control is accomplished through use of a positive 11-wire system.

A meter and switch on the transmitter front panel permit metering of various currents within the equipment, including power amplifier grid, plate, and antenna current.

Built in the 17L Transmitter is a coaxial relay that transfers the antenna from receiver to transmitter when the transmitter is energized. This relay also prevents antenna energy from being fed into the transmitter during receiving conditions and minimizes energy being sent from the transmitter into the receiver during transmitting conditions. The 17L is intended as a companion equipment to the Collins 51R VHF Navigation-Cummunication Receiver or the 51X Communications Receiver. Either of these aircraft receivers together with the 17L will provide full two-way voice communication facilities on all Federal Airways VHF communication channels. In addition, if the 51R is employed, the system will provide navigation facilities over omni ranges and localizers. When the companion receiver is to be used for navigation purposes, the Collins 68U Automatic Changeover Relay is employed to switch from the communications antenna to the navigation antenna. Switching contacts to operate the 68U are provided in the 51R Receiver.

Several types of remote frequency selection systems can be provided for a 17L Transmitter and 51R or 51X Receiver installation. Control of both transmitter and receiver from a single frequency selector for simplex operation (send and receive on the same frequency) is possible. Or if desired, control of transmitter and receiver from separate selectors permitting either simplex or duplex operation (send on one frequency and receive on another) can be provided. Lastly, control from single frequency selector for double channel duplex is possible. This provides automatic shift of transmitter frequency 6 mc higher than indicated on control (Receiver Frequency), whenever the DCD Switch is operated.

*Reg. U.S. Pat. Off.

SPECIFICATIONS

FREQUENCY RANGE: 118.0 to 135.95 mc with 360 channels having 50 kc spacing. Transmitter is supplied with crystals for producing the frequency range 118.0 to 131.95. Crystals for 132.0 to 135.95 are available at additional cost.

FREQUENCY STABILITY: Does not deviate more than ±0.004% under the following conditions taken one at a time:

(a) The dc input voltage is varied from 24 volts to 29 volts.
(b) The ambient temperature is varied from +10°C to +70°C.
(c) The humidity is varied from 10% to 95% at 50°C.
(d) The pressure is varied from normal to that equivalent to an altitude of 30,000 feet. (The equipment is not pressurized.)
(e) The tubes are exchanged in a random manner for like tubes that are within ARINC specifications.

Resonant frequency does not deviate more than ±0.007% when the ambient temperature is varied from −40°C to +10°C.

POWER OUTPUT: 25 watts.

OUTPUT IMPEDANCE: Unbalanced output into a 52 ohm load.

MODULATION:

Modulation Capability: With a sine wave input of 0.25 volt rms, 1000cps applied to the input of the microphone transformer the modulator is capable of modulating the RF carrier 90% over entire frequency r-f range.
Modulation Fidelity: The overall frequency response is within 6db from the response at 1000 cps from 300 to 10,000 cps.

AUDIO INPUT: 100 ohm carbon microphone; 0.25 volt rms input at 1000 cps will 90% modulate carrier.

AUDIO FREQUENCY DISTORTION: Does not exceed 10% at 90% modulation with 1000 cps input.

SIDETONE: With 90% modulation the equipment can deliver 100 milliwatts of rectified carrier sidetone signal into a 500 ohm line, one side of which may be grounded in the aircraft.

NOISE LEVEL: At least 35 db below 90% modulation.

POWER SOURCE: 27.5 volts DC, with the negative lead grounded.

TEMPERATURE RISE: Average rise 32°C under standard operating cycle.

AMBIENT TEMPERATURE RANGE: −40°C to +55°C.

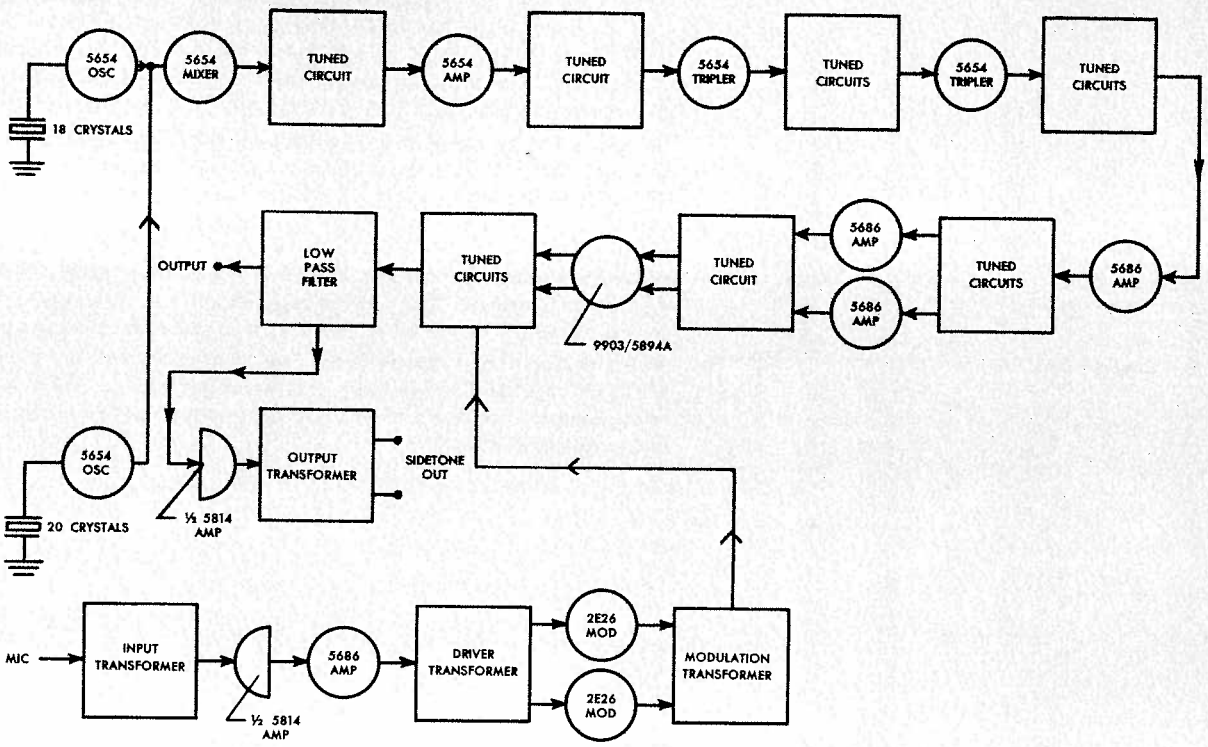
ALTITUDE: Up to 30,000 feet.

AMBIENT HUMIDITY RANGE: 0 to 95%.

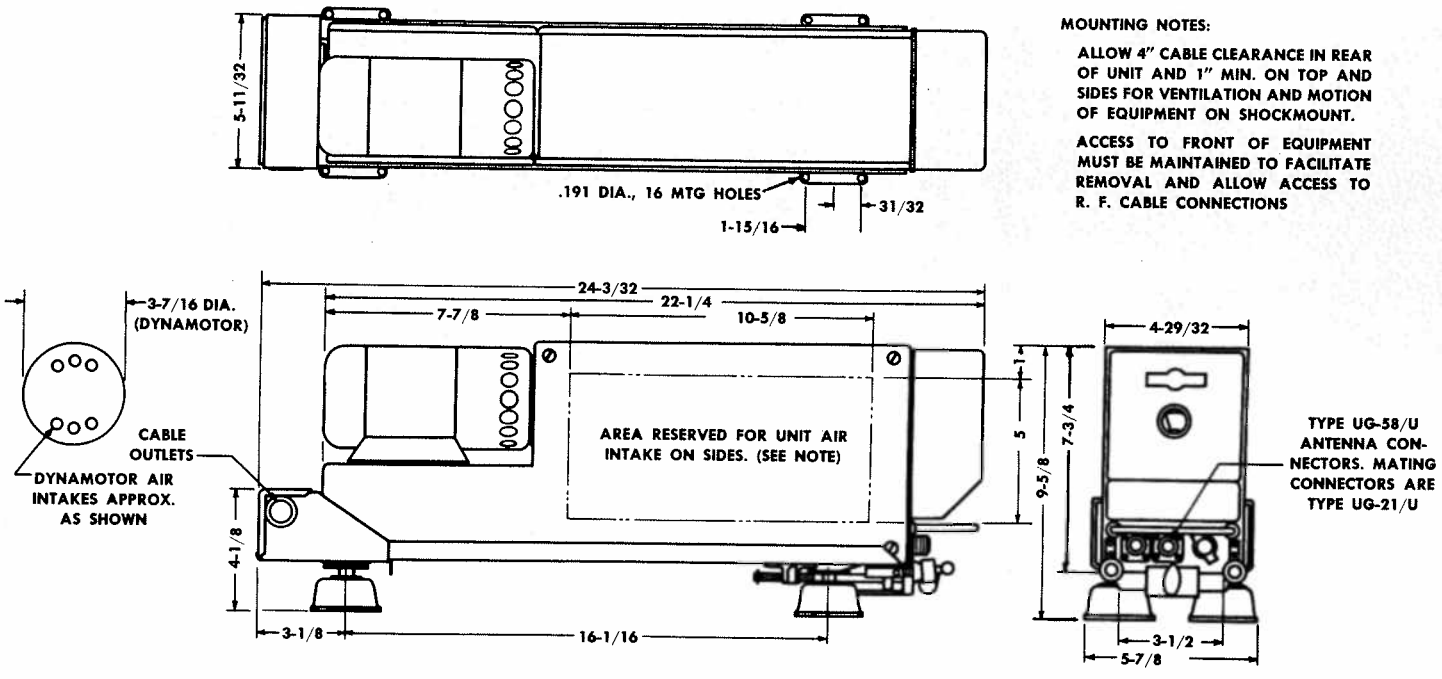
SIZE: 22-1/4" long, 4-29/32" wide, and 7-3/4" high without shockmount.
24-3/32" long, 5-7/8" wide, and 9-5/8" high on shockmount.

WEIGHT: 29 pounds without shockmount. Less than 32 pounds with 350J-2 shockmount.

17L-4 BLOCK DIAGRAM



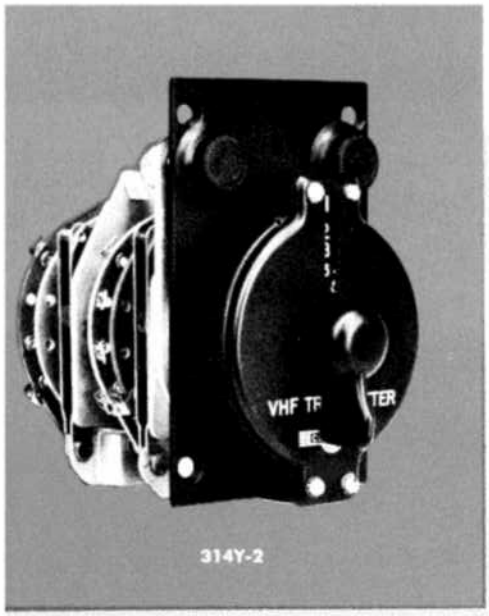
17L-4 OUTLINE DRAWING



MOUNTING NOTES:

ALLOW 4" CABLE CLEARANCE IN REAR OF UNIT AND 1" MIN. ON TOP AND SIDES FOR VENTILATION AND MOTION OF EQUIPMENT ON SHOCKMOUNT.

ACCESS TO FRONT OF EQUIPMENT MUST BE MAINTAINED TO FACILITATE REMOVAL AND ALLOW ACCESS TO R. F. CABLE CONNECTIONS



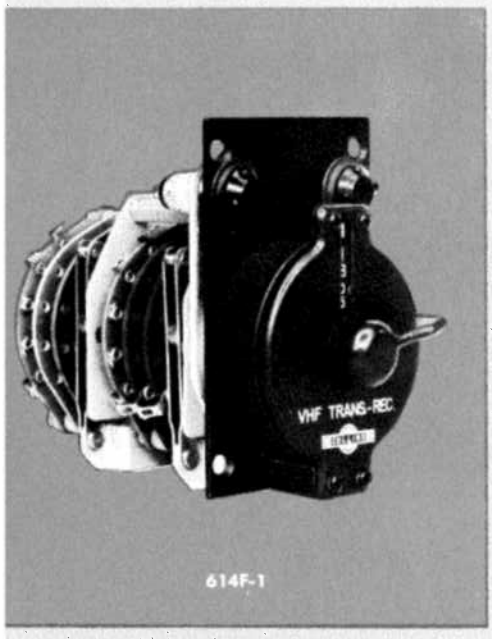
314Y-2

314Y-2, 614F-1, and 614F-2 FREQUENCY CONTROL UNITS

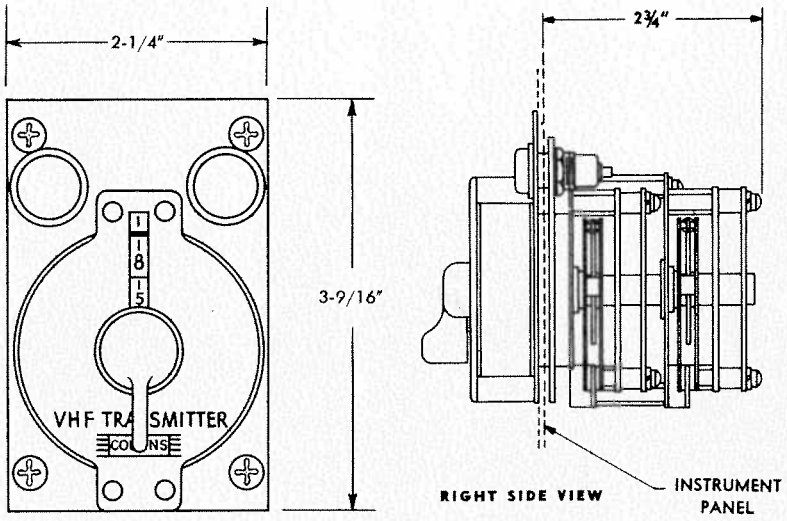
Any one of the 360 communication channels between 118.0 and 135.95 mc may be selected from the cockpit over a positive eleven-wire control system. The selection is made by one of Collins 314Y or 614F Control Units that contain switch wafers ganged together in two groups, the dials of which are combined to read frequency directly in megacycles.

Several methods of control of the transmitter and receiver may be utilized. The 314Y-2 may be used for independent control of the 17L or 17M Transmitter only. A 614F-1 may be installed for simplex control of either the 17L or 17M Transmitter and the 51X Communications Receiver. Or the 614F-2 Frequency Control Unit can be used with either of the same transmitters and the 51R Navigation Receiver. Additional accessory kits can be supplied to furnish receiver volume control function or receiver volume and squelch control function.

All control units are designed for "vertical mounting", as illustrated. All 314Y or 614F Control Units are of similar design and size, have lucite numerals, and are electrically illuminated for good readability under all conditions.

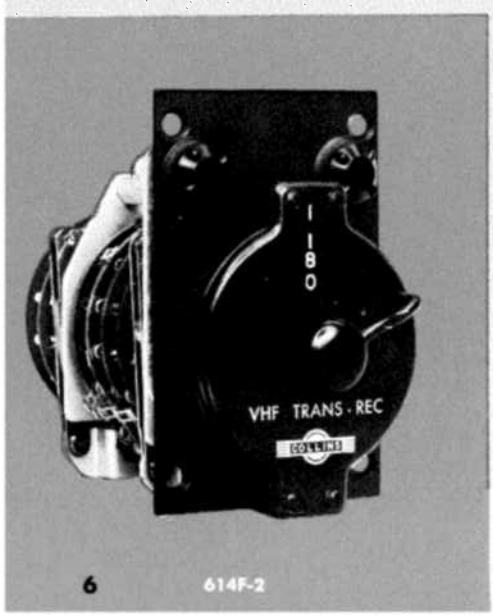


614F-1



314Y-2 OUTLINE DRAWING

614F Control Units have same mounting hole requirements.



614F-2

SPECIFICATIONS:

DIMENSIONS:

314Y-2: 3-9/16" high, 2-1/4" wide, and 2-3/4" behind the mounting surface.
614F-1: 3-9/16" high, 2-1/4" wide, and 3-3/8" behind the mounting surface.
614F-2: 3-9/16" high, 2-1/4" wide, and 3-1/16" behind the mounting surface.

WEIGHT:

314Y-2: 0.5 pounds maximum.
614F-1-2: 0.7 pounds maximum.

BULB TYPE: Mazda 327, midget flange base lamp.

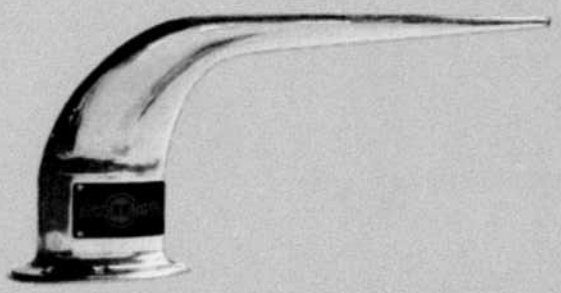
VOLTAGE: 28 volts.

CURRENT: 0.04 amp.

ASSOCIATED EQUIPMENT

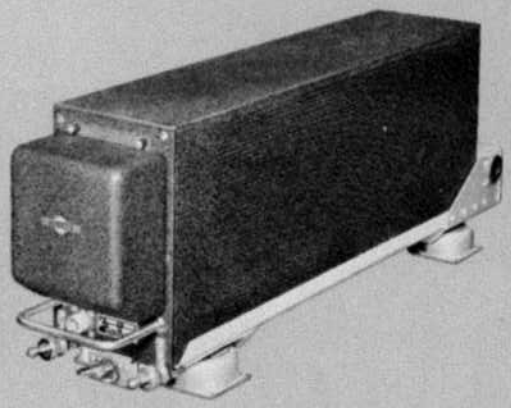
37R-1 COMMUNICATIONS ANTENNA

Associated with the 17L Transmitter is the Collins 37R Communications Antenna made expressly for two-way VHF communications in the frequency range 118.0 to 135.95 mc. The 37R mounts externally on the skin of the aircraft. With only the r-f connector protruding, installation is greatly simplified, especially on pressurized aircraft. Drag is approximately 1 pound at 250 miles per hour. Weight is just 3-1/2 pounds.



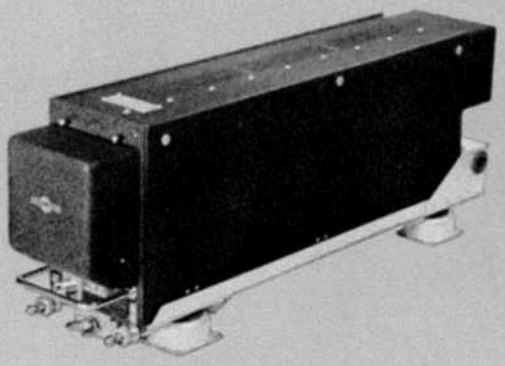
51X-1 COMMUNICATIONS RECEIVER

Designed as a companion to the Collins 17L or 17M Transmitters, the 51X receives amplitude modulated signals for communications and Air Traffic control signalling. Three microvolt sensitivity is provided and 50 kc spacing guarantees complete VHF coverage for present and anticipated needs with 360 available frequencies.



51R-3 NAVIGATION RECEIVER

The Collins 51R Receiver is also designed for use as a companion unit to the VHF transmitters, 17L or 17M, the two together forming a two-way VHF voice communications equipment. Additionally, if this receiver is employed, navigation facilities over omni ranges and localizers will be provided. Full instrumentation circuits are provided in the receiver and accessories for reception and presentation of all radio services now available in the 108.0 to 135.9 mc band.



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