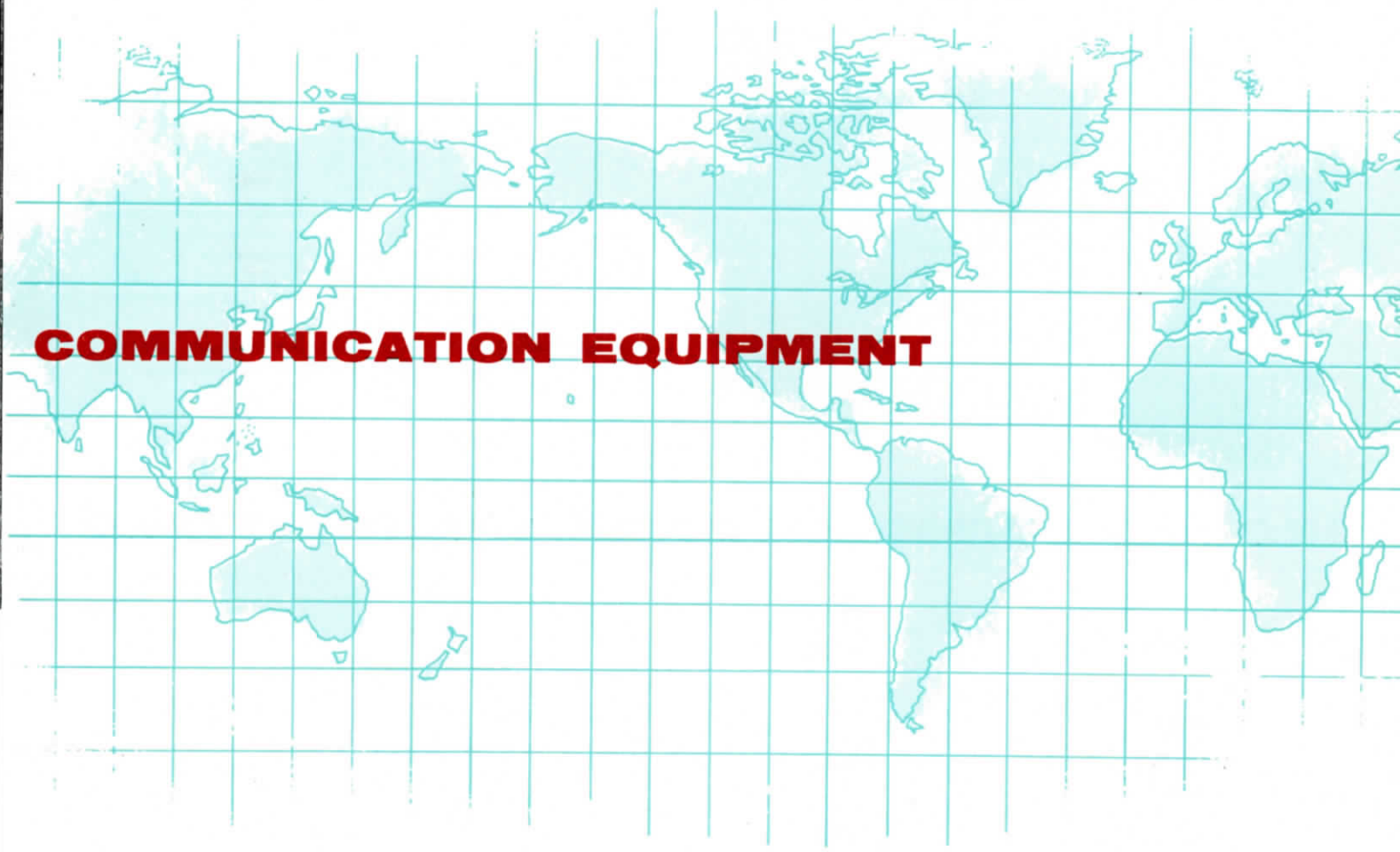
Collins HF, VHF GROUND

Traditional throughout Collins history has been the prestige of its ground communication equipment, a primary product area. This prestige was reflected in the selection of Collins transmitters by Admiral Byrd for his Antarctic expedition in 1933, the first year of the Company's corporate life. Today's Antarctic expedition under the command of Rear Admiral George Dufek — Operation Deepfreeze — is also depending heavily on equipment with the Collins trademark. Collins ground equipment is providing the same reliable communication at the opposite end of the world — DEW Line — as well as intermediate points all over the globe. In producing the best in ground communication equipment down through the years, Collins has made such contributions as developments in automatic tuning with Autotunes® and Autopositioners®, in linear-tuned circuits, in highly stable and precision-tuned oscillators, in the application of the Collins pi antenna matching network, in unitized construction, in the Mechanical Filter, as well as in advanced techniques such as single sideband emission (see page 58).



COMMUNICATION EQUIPMENT

231D-20 3000-WATT HF TRANSMITTER

The Collins 231D-20 3000-Watt HF Transmitter is the latest of a series of high power Autotune® transmitters in service all over the world. It provides 10 instantly selectable, crystal-controlled channels within the 3-26 mc frequency range. Channel selection is made on a telephone-type dial either locally or remotely.

EMISSION: AM, CW, FSK

FREQUENCY STABILITY: 0.005%

POWER OUTPUT:

Service (locked key)	3-5 mc	5-8 mc	8-16 mc	16-26 mc
A1	5.0 kw	4.5 kw	4.0 kw	3.5 kw
A2	3.0 kw	3.0 kw	2.5 kw	2.5 kw
A3	3.0 kw	3.0 kw	2.5 kw	2.5 kw

ANTENNA IMPEDANCE: Unbalanced antennas and single wire or concentric transmission lines with range of 50-1200 ohms resistive, 70-850 ohms at 45° phase angle or 100-600 ohms at 60° phase angle — 3-26 mc. Balanced antennas and transmission lines 300-1200 ohms or a 600-ohm transmission line with SWR up to 2 to 1 — 4-26 mc. Other impedances accommodated with external matching unit.

POWER SOURCE: 230 v, 3 phase, 50/60 cps — transmitter; 115 v, single phase, 50/60 cps — remote control unit. Maximum power, 10 kw at 95% PF.

GROUND COMMUNICATION TRANSMITTERS

431D-2/432D-2 HF TRANSMITTERS

These transmitters provide up to 10 channels in the 2-30 mc range with Autotune® control. The 431D-2 has a power output of 1000 w, the 432D-2 2000 w phone and 2500 w CW or FSK. There are provisions for crystal control, for internal frequency shift oscillator units on up to 3 of the channels or for external excitation (1 channel only) such as from a stabilized master oscillator. Remote control is available.

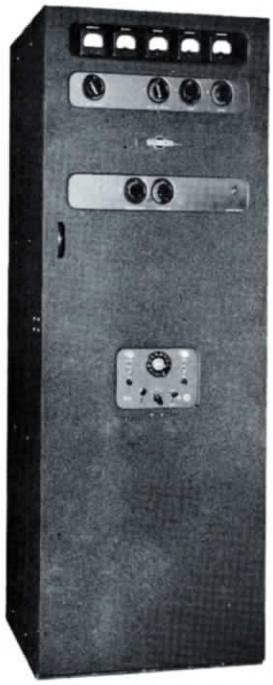
EMISSION: AM, CW, FSK

FREQUENCY STABILITY: CW or AM — 0.003%; FSK — 0.005%

POWER OUTPUT: 431D-2 — 1000 w
432D-2 — 2-20 mc, 2500 w CW-FSK, 2000 w AM;
20-24 mc, 2250 w CW-FSK, 1750 w AM;
24-30 mc, 2000 w CW-FSK, 1500 w AM.

RF OUTPUT IMPEDANCE: Unbalanced 52 ohms with up to 2 to 1 SWR. (Connector provided for RG-17/U coaxial cable.)

POWER SOURCE: 431D-2 — 230 to 208 v, single phase, 60 cps with 50 cps modification available; 432D-2 — 230 to 208 v, three phase, 60 cps with 50 cps modification available.



16F-14 400/250-WATT HF TRANSMITTER

The 16F-14 Transmitter, with power output of 400 w on CW and 250 w voice or MCW, employs the Autotune® system for rapid frequency change. Up to 10 crystal-controlled channels are available in the 2-20 mc range. FSK may be utilized with accessory equipment. Local or remote control is possible with a telephone-type dial.

RF OUTPUT IMPEDANCES: Unbalanced antennas or concentric transmission lines with range of 50-1200 ohms resistive, 70-850 ohms at 45° phase angle or 100-600 ohms at 60° phase angle.

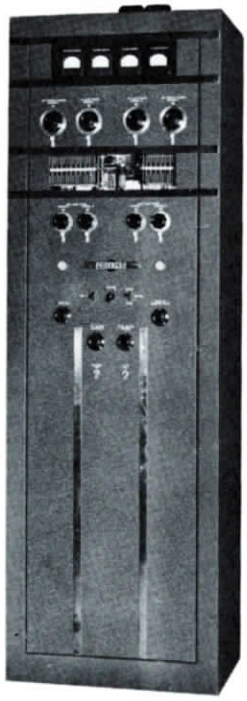
POWER SOURCE: 115/230 v, 50/60 cps, single phase — transmitter; 115 v, 50/60 cps, single phase — remote control unit. Maximum power, 1600 w at 85% PF.

32RA-10 75/50-WATT TRANSMITTER

The 32RA-10 Transmitter is a compact unit with nominal power output of 50 w for radiotelephone service and 75 w for radiotelegraph. Four frequencies in the 1.5-15 mc range are available for instant selection. Simplified panel controls enable operation by non-technical personnel.

RF OUTPUT IMPEDANCE: Collins pi network capable of matching wide range of antenna impedances.

POWER SOURCE: 115/230 v, single phase, 50/60 cps



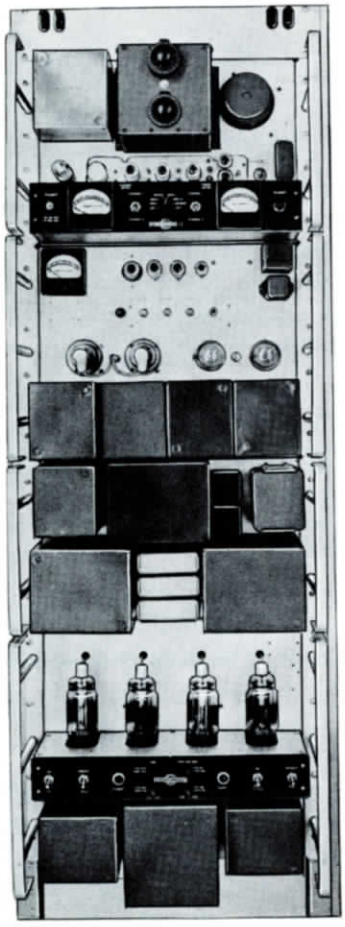
30K-5 300/150-WATT HF TRANSMITTER

Quick frequency change to either of two pretuned, crystal-controlled channels in the 2-30 mc range is featured in this proven 300/150-w HF transmitter. The 30K-5 can match unbalanced antennas throughout a wide frequency range. Remote control from several miles is obtainable over telephone line pairs. Accessories available for FSK operation.

FREQUENCY STABILITY: 0.004% from 0° to +50° C

NOMINAL POWER OUTPUT: 2-15 mc, 300 w CW, 250 w AM
15-24 mc, 250 w CW, 200 w AM
24-30 mc, 225 w CW, 150 w AM

POWER SOURCE: 230 v, single phase, 60 cps; easily reconnected for 115 v operation.



242F-2 200-WATT VHF TRANSMITTER

The 242F-2 is a crystal-controlled transmitter with a frequency range of 108-152 mc suited for ground-to-air or point-to-point service. Its 200 w power output is the maximum practicable for this frequency range because very little distance is added with greater power. Basically a single channel transmitter with crystal switching, the 242F-2 can be operated on a second frequency without retuning if channel separation is not more than 0.3% of operating frequency. Additional channels may be obtained by adding extra RF units to the power supply/modulator.

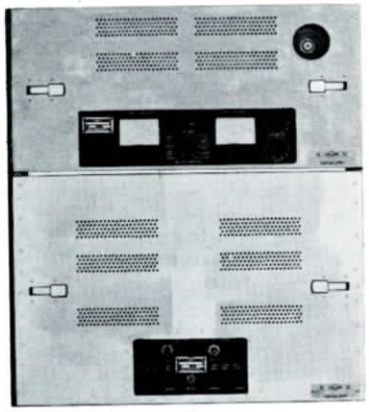
FREQUENCY STABILITY: ±0.001%

OUTPUT IMPEDANCE: 52 ohms

HARMONICS AND OTHER SPURIOUS OUTPUT: At least 80 db below carrier level.

POWER SOURCE: 115 or 230 v, single phase, 50/60 cps, with full load transmit power of 1200 w, 90% lagging PF.

GROUND COMMUNICATION TRANSMITTERS



242F-5 50-WATT VHF TRANSMITTER

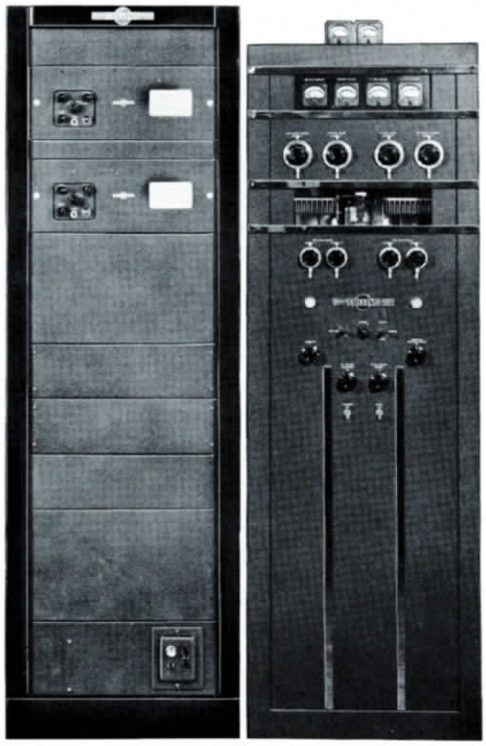
The 242F-5 is a 50-w transmitter for continuous duty AM communication service in the 108-152 mc range. A linear power amplifier provides low spurious output and reduces intermodulation interference between transmitters. Although the 242F-5 is basically a single channel transmitter with crystal selection, an optional feature is operation on any one of four frequencies within a 500 kc spectrum.

FREQUENCY STABILITY: 0.005% or 0.002% depending on crystal

OUTPUT IMPEDANCE: 50 ohms nominal, but proper loading obtainable into any load up to 3 to 1 VSWR.

HARMONICS AND OTHER SPURIOUS OUTPUT: All spurious except second and third harmonics over 100 db below carrier level; second and third harmonics at least 90 db below carrier level.

POWER SOURCE: 115 or 230 v, single phase, 50-60 cps with full load requirement of 460 w, 87% lagging PF.



661A-14 HF SYSTEM

This package HF communication system is designed for non-simultaneous two-channel operation. One antenna is used for both transmission and reception on each channel. The transmitter unit is the Collins 30K-5 300/150-Watt Transmitter operating on two pretuned crystal-controlled frequencies between 2 and 30 mc (see 30K-5 description, page 67).

The control-receiver unit contains: two 51N-7 single channel, fixed-tuned, crystal-controlled AM receivers (see 51N-7 description, page 71); two 6T-1 Line Amplifiers for amplification of receiver audio to speaker level; a 271B-3 Dual Speaker Panel; a muting channel for disconnecting of receiver inputs and disabling of receiver audio inputs during transmission, and a jack channel for headphones. These units, together with a 182A-2 Circuit Breaker, are mounted in a 619F cabinet complete with wiring cables.

GROUND COMMUNICATION SYSTEMS

661B-1 (Includes remote control facilities) 661B-3

661B-1/3 VHF SYSTEMS

The 661B-1 is a complete equipment package with remote control functions for voice communication in the 108-152 mc frequency range. Although the system is normally supplied for single-channel operation, the number of channels may be increased by adding RF units and receivers. The system consists of two major units: the 242F-5 50 w, continuous duty transmitter (see 242F-5 description, page 68) and the 51M-8A Receiver (see description, page 71), both mounted in a 619F cabinet. A second cabinet contains the control unit, line level amplifier and speaker panel. Two metallic audio pairs plus ground return are required for normal remote operation. Muting circuits are incorporated to silence the receiver when the transmitter carrier is on, and all interunit cabling is supplied with the package.

The 661B-3 System performs identical functions, but does not have remote control facilities.

51J-4 MF/HF RECEIVER

The 51J-4 is a multiple conversion superheterodyne receiver for top performance and accuracy from 0.54 to 30.5 mc. A crystal-controlled high-frequency oscillator and highly stable low-frequency oscillator permit accurate linear calibration of one dial division per kc on all bands. Collins Mechanical Filters give the closest approach to ideal selectivity ever achieved in a communication receiver, with filters available for 1.4-, 3.1- and 6-kc bandwidths.

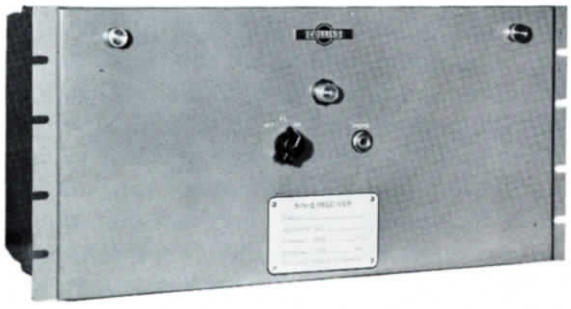
TYPES OF RECEPTION: AM, SSB, CW, MCW, FSK

FREQUENCY STABILITY: Dial calibration at room temperature within 300 cps, if nearest 100-kc point is used to adjust fiducial.

SENSITIVITY: 5 uv or less for 10 db sig/noise ratio and 1 w output into 600 ohms, except band 1 (.54-1.5) 15 uv or less.

POWER SOURCE: 85 w, 45/70 cps, 115 v, or 230 v by reconnection on power transformer.

GROUND COMMUNICATION RECEIVERS



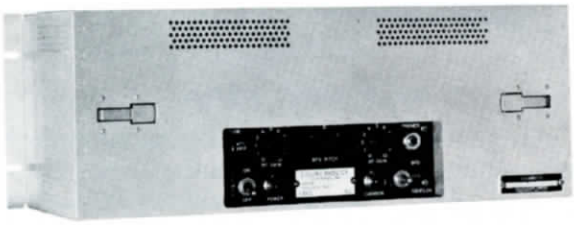
51N-5 HF RECEIVER

The 51N-5 Receiver is designed for single-channel radio teletypewriter or regular CW reception in the 2-24 mc frequency range. A temperature-controlled crystal is used in the high frequency oscillator to provide an extremely stable injection source. This receiver is made for unattended continuous duty, and it will give long, trouble-free operation with only routine maintenance.

SELECTIVITY: 2.5 kc at 6 db

CW SENSITIVITY: Less than 1 uv for 10 db sig/noise ratio.

POWER SOURCE: 155 or 230 v, single phase, 50/60 cps.



51N-7 HF RECEIVER

The 51N-7 is a fixed-tuned, crystal-controlled receiver advantageous for continuous, unattended operation in the 2-24 mc range. A Mechanical Filter is used to achieve excellent selectivity characteristics. The 51N-7 is capable of receiving AM, CW, MCW and FSK (with narrower Filter) signals. Three rack mounting styles are available: flush, recessed or hinged mounting.

SENSITIVITY: 2.9 uv input for minimum of 10 db sig/noise.

IF BANDWIDTH: 4 kc ±10% at 6 db, 10 kc maximum at 60 db.

POWER SOURCE: 115 v ±10% or 230 v, 50/60 cps; 60 w.

51M-8A VHF RECEIVER

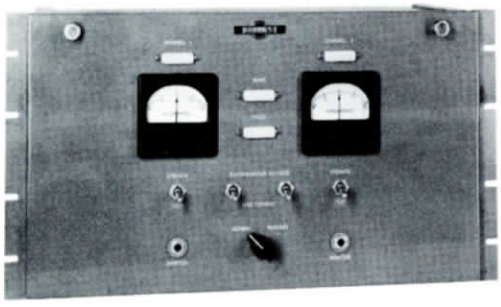
This single-channel, preset, crystal-controlled receiver is ideal for continuous, unattended reception of AM radio-telephone signals in the 108-152 mc range. A double conversion, superheterodyne circuit is utilized with an advanced automatic noise limiter and improved carrier operated squelch circuit. Available with flush, recessed or hinged mounting.

FREQUENCY STABILITY: 0.002% stability with premium-type crystals.

SENSITIVITY: Sig/noise ratio for 2 uv input modulated 30% not less than 6 db.

SELECTIVITY: Bandwidth at 6 db attenuation not less than 40 kc; bandwidth at 80 db attenuation not more than 80 kc.

POWER SOURCE: 115/230 v, single phase, 50/60 cps; 60 w.



706A-2 FREQUENCY SHIFT CONVERTER

The 706A-2 operates from the output of two communication receivers arranged for diversity reception. Frequency shifts of 600 or 850 cycles are selected by a switch with other shifts available on special order. The 706A-2 provides high reliability on either a single channel or multiplex circuit. It may be used with the 51M-8A, 51N-5, 51J-4 or 51N-7. Requires 707A-1 Power Supply (not illustrated).

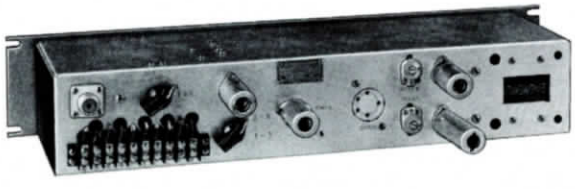
POWER REQUIREMENTS: 117 v ±10%, 50/60 cps; 160 w.
POWER OUTPUT: 75 w

709A-1 FREQUENCY SHIFT KEYER

This unit provides two-frequency keying facilities for radiotelegraph, radioteleprinter or facsimile. Output frequency in the 2-4 mc range is shifted upward or downward producing an output corresponding to the dc polar or neutral inputs. RF input is supplied by a stable external oscillator, such as 708A-3. Power is furnished by 707A-2 Power Supply.

FREQUENCY SHIFT RANGE: 0-±1000 cps
INPUT: 2 v across 50 ohms, 2.2-4.2 mc
OUTPUT: 3 w, 50-ohm non-inductive load

FREQUENCY SHIFT EQUIPMENT



709D-1 FREQUENCY SHIFT KEYER

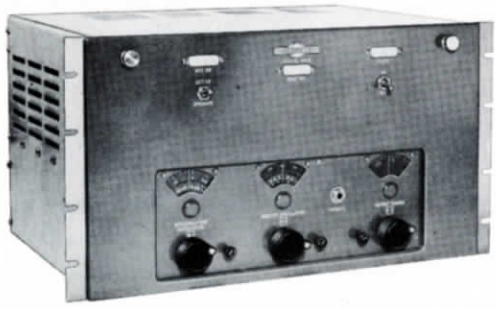
The 709D-1 Frequency Shift Keyer is a compact source of transmitter excitation for FSK operation in the 1-15 mc range. With two keyers and one polar keying relay, a day and a night frequency are obtainable. Up to three keyers may be paralleled for transmitting the same traffic on three transmitters simultaneously. Uses 707A-4 Power Supply.

FREQUENCY SHIFT: Continuous up to 0.015%
OUTPUT: 3.5 v across 50 ohms

707A-4 POWER SUPPLY

The 707A-4 Power Supply is designed for use with the 709D-1 Frequency Shift Keyer, providing power for up to three 709D-1's simultaneously. The front panel may be lowered to give access to fuses and tubes and to permit bias adjustments.

POWER SOURCE: 115 v, single phase, 50/60 cps
POWER OUTPUT: 220 v, 100 ma dc; 6.3 vac; keying relay bias current for neutral operation.



708A-3 STABILIZED MASTER OSCILLATOR

The 708A-3 is a continuously variable frequency standard covering the 2-4.2 mc frequency range. Output frequency is accurate to within 30 cps with stability of 5 parts per million. Auxiliary outputs of 100 kc and 450 kc available. May be used with the 709A-1 or as a transmitter exciter or receiver injection oscillator.

POWER REQUIREMENTS: 115 v, single phase, 50/60 cps, in addition to 707A-2 Power Supply.

OUTPUT: 9 v into 50 ohms

707A-2 POWER SUPPLY

The 707A-2 is a dual power supply capable of furnishing power for both the 708A-3 Stabilized Master Oscillator and the 709A-1 Frequency Shift Keyer simultaneously.

POWER SOURCE: 115/230 v, single phase, 50/60 cps

POWER OUTPUT: +150 vdc regulated 15 ma; +250 vdc unregulated 140 ma; +250 vdc unregulated 250 ma; 100 vdc at 1 ma; 6.3 vac at 6 amps; 6.3 vac at 8.5 amps.

716A-2 FREQUENCY SHIFT RECEIVER PACKAGE

The 716A-2 Frequency Shift Receiver Package is engineered for highly reliable reception and conversion of single channel or multiplex teletypewriter signals in the 2-24 mc range. The package consists of two fixed-tuned 51N-5 Receivers (see 51N-5 description, page 70), a 706A-2 Frequency Shift Converter (see description, page 72) and a 707A-1 Power Supply.

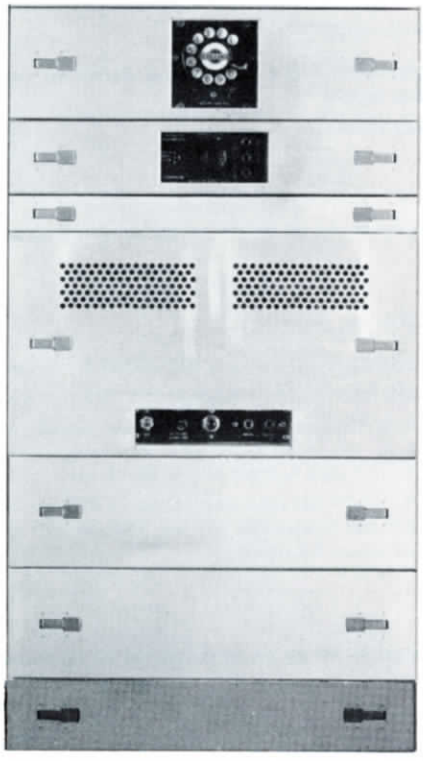
POWER SOURCE: 115 v, single phase, 50/60 cps

716C-1 FREQUENCY SHIFT RECEIVER PACKAGE

The 716C-1 employs continuous-, linear-tuned receivers in providing highly reliable reception and conversion of single channel or multiplex teletypewriter signals in the .54-30.5 mc range. The package consists of two 51J-4 Communication Receivers (see description, page 70) for diversity reception, a 706A-2 Frequency Shift Converter (see description, page 72) and a 707A-1 Power Supply, all mounted in a 619F-2 cabinet.

POWER SOURCE: 115 v, single phase, 50/60 cps

RC-101 REMOTE CONTROL SYSTEM



RC-101 Remote Control Equipment Rack Mounted

278G-1 Remote Control Unit at Control Point

The RC-101 Remote Control System was designed to control all functions of two transmitters and two receivers at each of twelve remote sites connected to each other and to a central operating position by a four-wire, two-way standard long distance telephone circuit. One pair handles outgoing transmitter modulation and control information, while the other pair returns the receiver audio. Push-to-talk control is normally applied to all previously selected transmitters, although individual push-to-talk control to any part of the system is available.

Audio signalling is used employing a 2500 cps carrier frequency modulated by either a 90- or 150- cps subtone. Standard telephone dialing circuitry is used to pulse the 150 cps subtone. At the remote site, the detected pulses operate a stepping switch to accomplish the desired switching of power, audio and antenna circuitry.

The control carrier tone, using the 90 cps subtone for locking the transmitter in keyed status and the 150 cps for unlocking, time-shares the outgoing telephone circuit. No audio is applied in standby.

POWER SOURCE: 115/230 v, single phase, 50/60 cps

OVER-ALL SIZE: 60" high, 19" wide, 12" deep

Control Circuits

TELEPHONE LINE LEVEL VARIATION: ±20 db variations provided nominal level does not go below −15 dbm.

SIGNAL TO NOISE: +10 db minimum excepting noise in range 2000 to 3000 cps which must not exceed 30 dbm below the control carrier level.

SPEECH LEVEL TO CONTROL CARRIER LEVEL: The system shall not malfunction with a speech level 20 db greater than the nominal control carrier level.

REMOTE DIALING: The system will perform satisfactorily when supplied with dial impulses of the following character:

Not slower than 5 impulses per second.
Not faster than 15 impulses per second.

With a break-to-make ratio as follows:
Not more than 75% break per pulse.
Not less than 50% break per pulse.

Transmitter Modulation

DISTORTION: Not more than 5% (not including telephone line performance) as normally installed.

INPUT LEVEL: −15 dbm minimum as normally installed.

OUTPUT: With −15 dbm input, +6 dbm output at 1000 cps.

REMOTE CONTROL UNITS

177G-10

The 177G-10 Remote Control Unit, which may be either rack or table mounted, is designed for use with the 231D-20 and 16F-14 Autotune® HF Transmitters. The unit provides dial control of the transmitter and performs the functions of transmitter start-stop, standby, channel selection, emission selection, keying and microphone input.

A hand key and standard desk stand carbon microphone with press-to-talk lever can be plugged into jacks on the panel. Two cable pairs and a ground return are required for interconnection with the transmitter.

POWER SOURCE: 115 v, single phase, 50/60 cps

177L-2

The 177L-2 Remote Control Unit is designed for use with the 30K-5 HF Transmitter and 242F-2 VHF Transmitter. Functions include: transmitter on-off, channel selection, line level monitoring, emission selection, audio gain and microphone and key inputs. The complete interconnecting cable consists of two pairs of telephone lines and a ground.

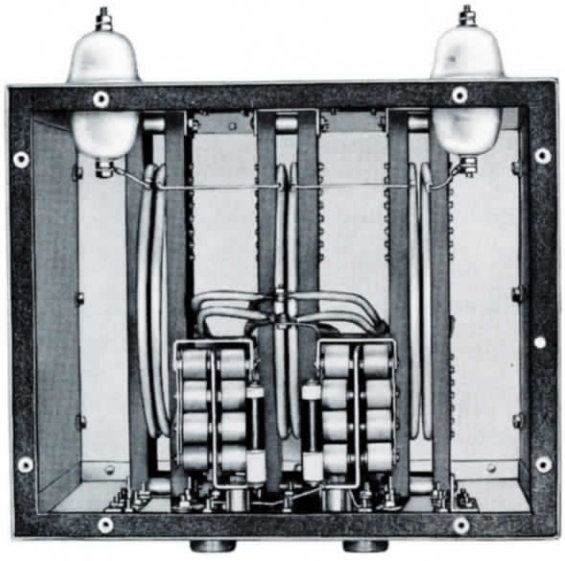
POWER SOURCE: 115 v, single phase, 50/60 cps

177M-1

The 177M-1 Remote Control Unit is used with the 431D-2 and 432D-2 Autotune® HF Transmitters. The unit provides dial control of the transmitter and performs the functions of transmitter start-stop, standby, channel selection, emission selection, keying and microphone input. It has a speech amplifier incorporating speech compression. Indication is provided of the channel, transmitter-on and audio level. The unit requires four wires plus a ground return for interconnection with the transmitter.

POWER SOURCE: 115 v ±5%, single phase, 50/60 cps

ACCESSORY EQUIPMENT



512B-2 HF RF IMPEDANCE CONVERSION UNIT

The 512B-2 provides a means of coupling a transmitter 52-ohm unbalanced RF output with a 300-600-ohm balanced transmission line. The unit may be used with transmitters with powers up to 3 kw AM or 5 kw PEP single sideband and with frequency ranges between 2 and 30 mc. No tuning or adjusting is necessary because the 512B-2 is broadband over the 2-30 mc range. The unit is housed in weatherproof casing.

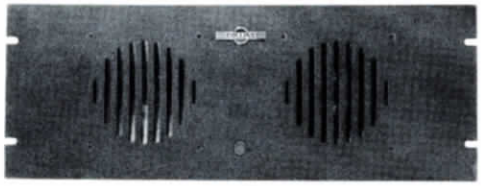
OVER-ALL SIZE: 23¼" wide, 20⅞" high, 23⅛" deep

156A-1 HF RECEIVER COUPLER

The 156A-1 couples up to five independently operating receivers to a single receiving antenna system operating in the 2-32 mc range. Additional receivers may be accommodated by connecting two or more antenna couplers in tandem.

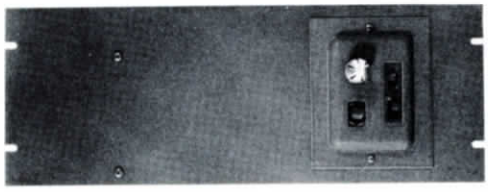
IMPEDANCE: 70 ohms (input and output)

POWER SOURCE: 105-125 v, single phase, 50-400 cps



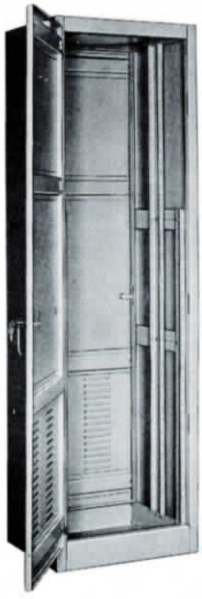
271B-3 DUAL SPEAKER

The 271B-3 is a dual speaker panel with a 600 ohm-to-voice coil impedance matching transformer. A terminal board is included with each speaker.



RACK TERMINAL PANEL

This panel contains a 15-amp circuit breaker for terminating ac power and a telephone-type terminal block for terminating rack wiring and remote connections. It fits in a standard 19″ rack.



619F CABINETS

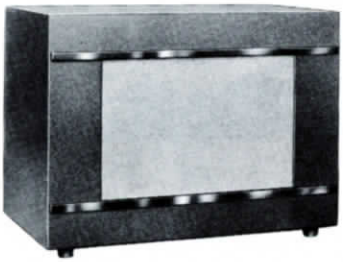
The 619F series cabinets offer flexible equipment mounting enclosures with choice of door sizes. A mounting channel may be positioned from 1⅜″ to 8½″ behind the front cabinet surface, permitting either flush or recessed mounting. Finish is medium semi-gloss gray.

Type	Over-all Height	Panel Space	Over-all Width	Panel Width	Over-all Depth	Inside Depth
619F-6	48⅛″	42⅛″	22″	19″	19½″	18″
619F-2	76⅛″	70⅛″	22″	19″	19½″	18″

RECEIVER CABINET

Houses standard 10½″ x 19″ panels, such as 51J and 75A Receivers. Has St. James gray wrinkle finish.

OVER-ALL SIZE: 21⅛″ wide, 12¼″ high, 13⅛″ deep



270G-3 CABINET-SPEAKER

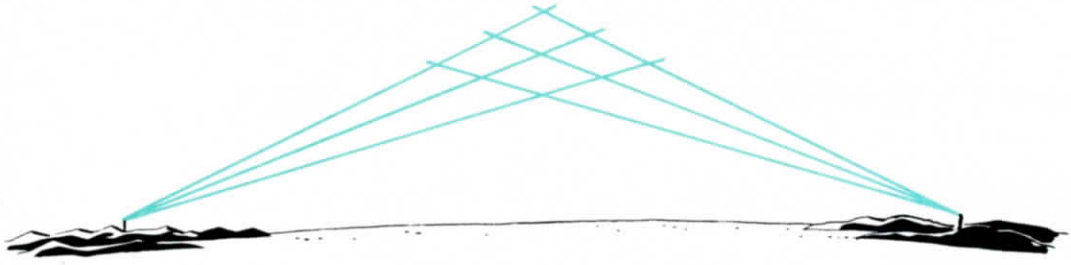
This unit consists of cabinet and 10″ PM speaker, 6-8 ohm impedance voice coil, 8 w.

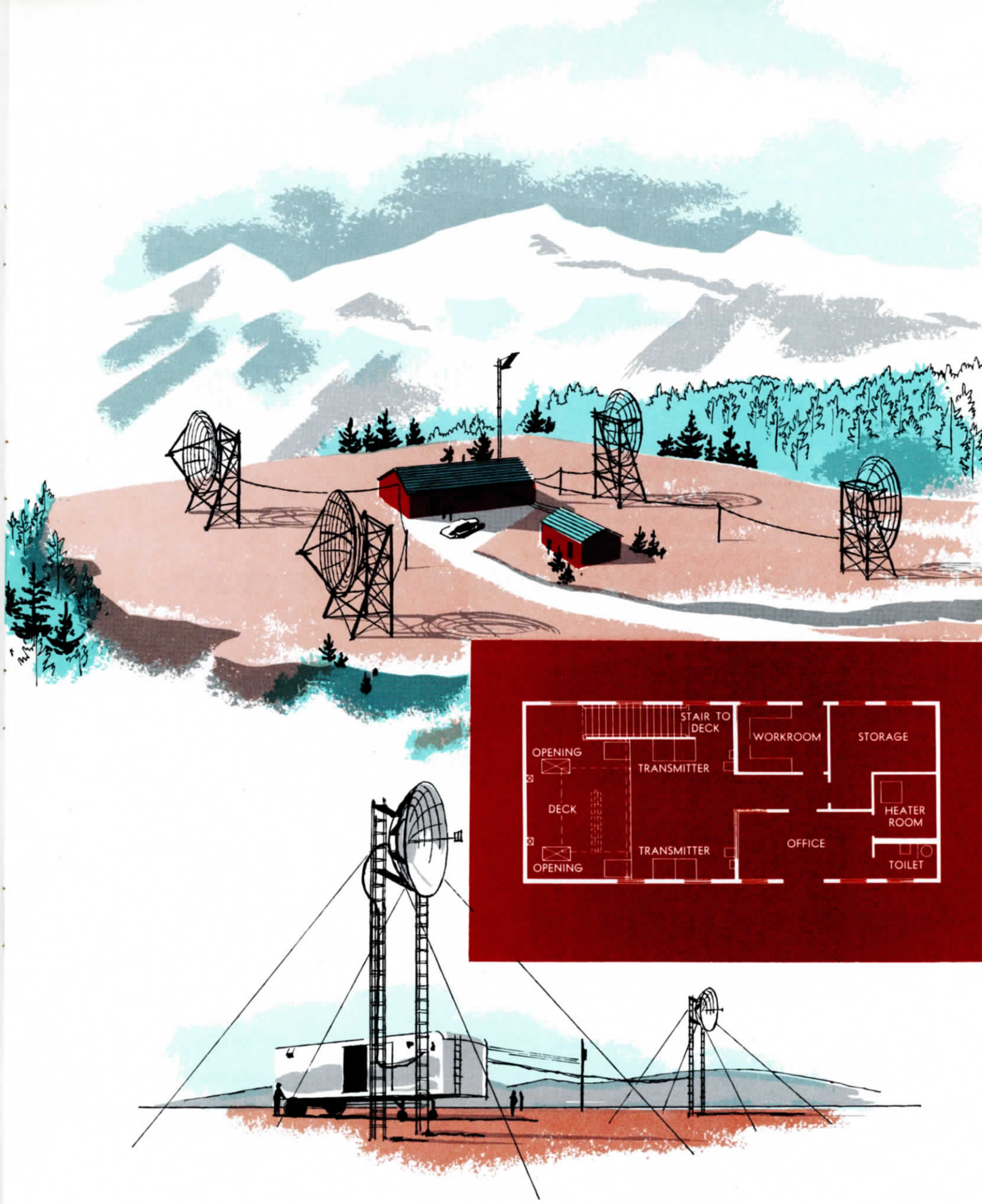
One of the most significant products of Collins research in the last ten years has been its UHF and VHF transhorizon systems.

Collins UHF circuit tests indicate effective reception up to 350 miles, and VHF reception up to 1200 miles. Operation is possible from 30 to 3,000 mc — a relatively available range — and features such as persistency of received signal strength, bandwidths not limited by large multipath delays and elimination of much external noise have been developed. From these tests and demonstrations have evolved ground- and air-transportable systems.

Collins is peculiarly qualified to solve your communication problems on a complete systems basis. We will be happy to assist you in an evaluation of your requirements, then furnish, install and service compatible systems that will provide the most effective and economical communication.

Collins TRANSHORIZON COMMUNICATION SYSTEMS




STAIR TO DECK
WORKROOM
STORAGE
OPENING
TRANSMITTER
DECK
HEATER ROOM
TRANSMITTER
OFFICE
OPENING
TOILET

240D-1 10KW TRANSMITTER

The 240D-1 has an output power of 10kw in the 700-1,000 mc frequency range. It may be operated on the higher or lower frequencies. In the 700-1,000 mc range a four cavity power-amplifier type klystron provides 50 db gain with a 3 mc bandwidth. Additional bandwidth may be gained by a slight reduction in amplification. Calibrated directional couplers monitor both input and output transmission lines.

EMISSION: FM, bandwidth 3 mc

DRIVE POWER: 0.1 w nominal, obtained from 310K/N

FREQUENCY STABILITY: .001% when driven by 310K/N Exciter

RESIDUAL AMPLITUDE MODULATION: Less than 0.3%

SPURIOUS OUTPUT: Following low pass filter all spurious and harmonic output frequencies are at least 80 db below carrier level

COOLING: Liquid-to-air heat exchanger and forced air

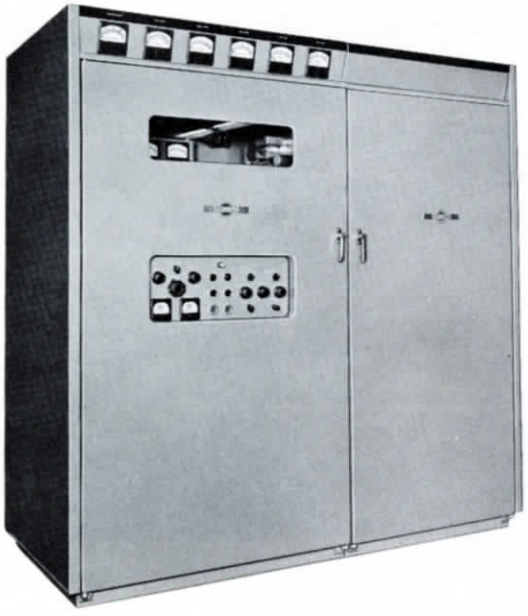
TEMPERATURE RANGE: −18°C to +54°C

POWER INPUT: 208 v, 55 KVA

CABINET DIMENSIONS:
Klystron control and RF cabinet 116" W, 34" D, 78" H
Rectifier cabinet 32" W, 20½" D, 78" H
Heat exchanger 50" W, 25" D, 72" H

WEIGHT: 8,700 lbs

UHF TRANSHORIZON SYSTEMS



240E-2 1KW TRANSMITTER

Utilizing a 3K3000LQ klystron, the 240E-2 operates in the 700-1,000 mc range. The three-cavity air cooled klystron gives minimum gain of 30 db at a bandwidth of 2 mc. Slight reduction of gain provides additional bandwidth.

POWER OUTPUT: 1 KW, CW nominal, 2 KW, CW maximum

DRIVING POWER: 5 w maximum

FREQUENCY STABILITY: .001% when driven by 310K/N Exciter-Modulator

SPURIOUS OUTPUT: A low pass filter is installed within the cabinet in the output transmission line. Following this filter all spurious and harmonic outputs are at least 70 db below carrier level

RESIDUAL AMPLITUDE MODULATION: Less than 0.3%

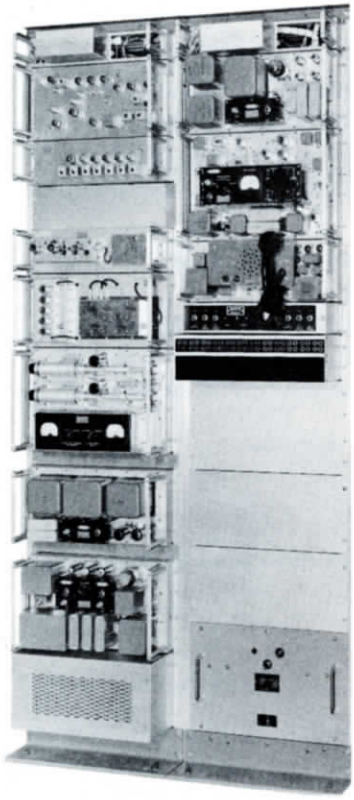
COOLING: Forced air

TEMPERATURE RANGE: −18°C to +54° C

PRIMARY POWER INPUT:
30, 4 wire, 60 cycle +3 −10 cycles, 208 v ±10%
8 kw with 2 kw output
6 kw with 1 kw output

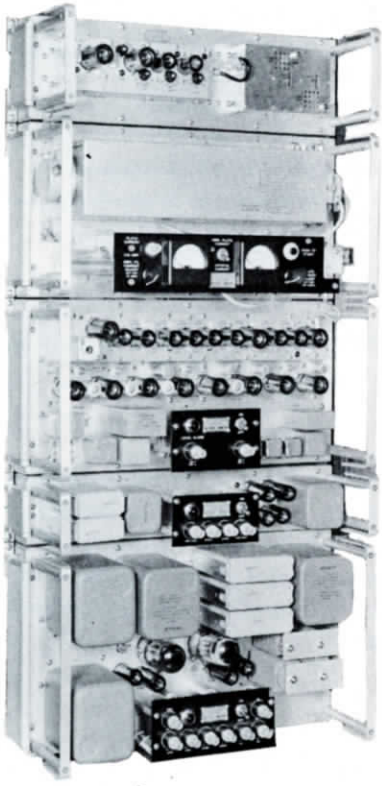
CABINET DIMENSIONS: Power supply; 42" W, 34" D, 78" H;
Klystron: 33 11/16" W, 34" D, 78" H

WEIGHT: 2,600 lbs



310K/N EXCITER MODULATORS

These Exciter-Modulators will supply phase modulated excitation to UHF transmitters operating in the 700-1000 mc frequency range. Power output is 10 watts into a 52 ohm coaxial transmission line. Up to 120 voice channels can be accommodated. Built-in test facilities measure input and output levels of order wire and multiplex signals. Mounting: RETMA standard 19″ relay rack, 7″ front projection, articulated hinge on left side to swing out for maintenance.

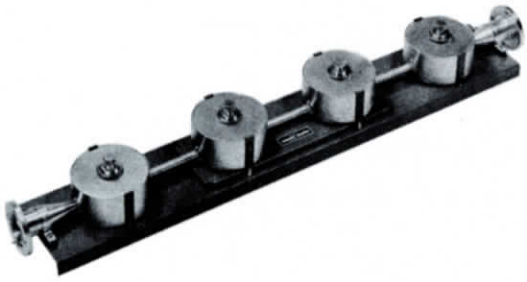


50G-1/2/3/4/5 RECEIVERS

The 50G Receivers are double conversion FM units operating in the 700-1,000 mc frequency range.

Two or more receivers may be employed for diversity reception by paralleling to obtain a combined output signal with a signal-to-noise ratio equal to or better than the S/N ratio in either Receiver. The Receiver is intended for fixed station operation on a preassigned frequency and utilizes quartz crystals for the generation of injection frequencies.

Rack mounting is employed featuring individual subassembly chassis which are hinged and swing out to facilitate maintenance. Receivers may also be mounted back-to-back on a 6-inch channel.



35Q-1 COAXIAL BANDPASS FILTER

The four section 35Q-1 will supply the additional bandpass filtering between the receiver and branching filter, which is required by most communication systems. It features wide tuning range, low insertion loss and small size.

FREQUENCY RANGE: 750 to 985 mc

POWER RATING: 250 w

PASSBAND INSERTION LOSS: 0.5 db maximum over 7 mc bandwidth

PASSBAND VSWR: 1.15 maximum 7 mc passband

REJECTION: 50 db at frequencies 60 mc or more removed from center of passband

DIMENSIONS: 6" x 6" x 36"

35R-1 COAXIAL BRANCHING FILTER

The 35R-1 consists of two 3⅛" coaxial line rejection notch filters joined by a coaxial T-section. The antenna connects to the leg of the T and the receiver and transmitter to the arms. Each notch filter contains three reasonant-stub cross lines with the assembly suitably tunable for use from 750 mc to 985 mc.

FREQUENCY RANGE: 750-985 mc

POWER RATING: 10 kw maximum; 2.5 kw with less than 100 mc receiver-transmitter spacing

PASSBAND WIDTH: 7.0 mc or greater

PASSBAND VSWR: 1.15 maximum

PASSBAND INSERTION LOSS: 0.2 db maximum

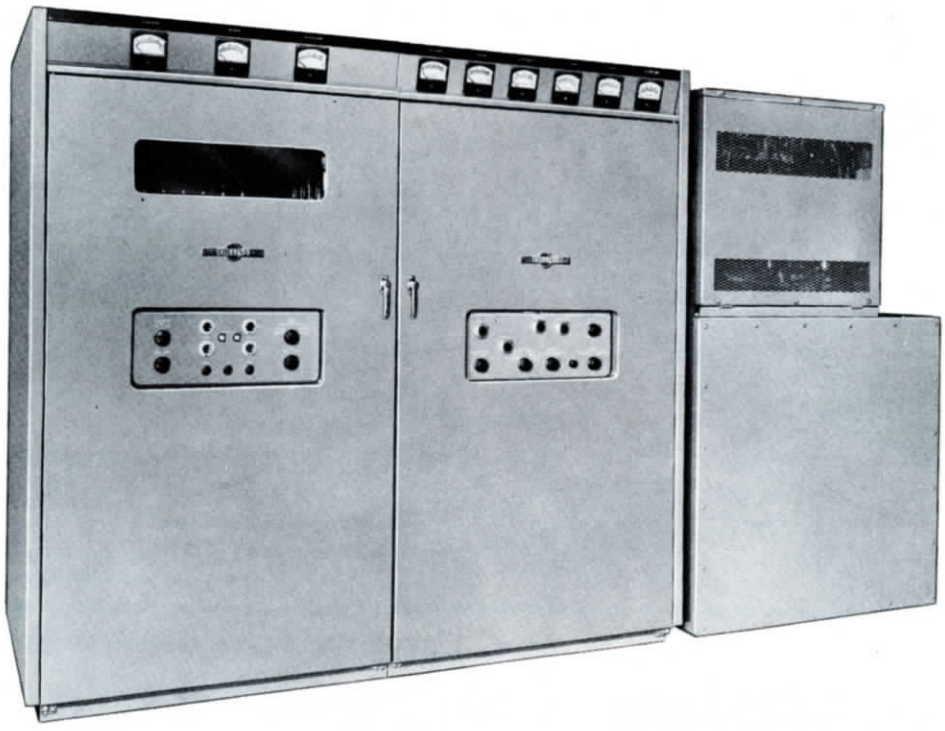
REJECTION NOTCH ATTENUATION: 50 db minimum over 7 mc bandwidth

DIMENSIONS: 65" x 73" x 5"

137Q ANTENNA ASSEMBLIES

These antennas are for fixed or transportable applications and consist of a 15-foot parabolic reflector; broadband antenna feed assembly; a tower assembly including two 40-foot towers, cross bracing for mounting the reflector, and either manually adjusted or motor driven azimuth equipment.

Also available for transportable application is an antenna erection equipment kit, including an A frame, pulleys, etc. When the requirements are for only reflector and feed assembly, Collins supplies a tower mounting kit for installation of the reflector on available supporting structures.



205G-1 20KW TRANSMITTER

Designed especially for VHF scatter, the 205G-1 has linear operation with low distortion permitting multiplex RTTY and/or voice with minimum interference. Only four tuned circuits are used, each covering 30-50 mc. A circuit modification allows tuning to 20 mc. All subunits and components are easily accessible from front.

TYPE OF EMISSION: A^1, A^{3B} or teleprinter signals

POWER OUTPUT: 20 kw carrier or peak envelope power

OUTPUT IMPEDANCE: 52 ohm with up to 1:5 SWR. An accessory transmission-line coupler is available to match the transmitter output to a 600 ohm balanced line.

DRIVE REQUIREMENTS: 0.5 w at carrier frequency, 52 ohm

SSB DISTORTION: 3rd order distortion product at least 30 db below one tone of a two-tone test signal at 20 kw peak envelope power

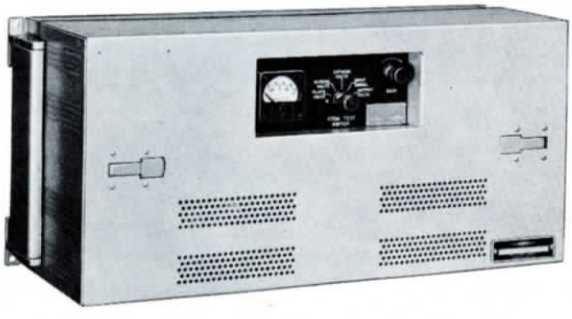
HARMONIC OUTPUT: 2nd harmonic at least 40 db and others at least 50 db down. Added filtering may be placed in 52 ohm output line.

SIZE: Transmitter enclosed in two cabinets with overall dimensions of 83¾" W, 34" D and 78" H. The external blower and air-filter housing is 44" H, 30" D and 44¾" W. The external plate transformer is 30" H, 17" D and 32" W.

PRIMARY POWER REQUIREMENTS: 15 KVA with Zero drive. 45 KVA 20 kw output

WEIGHT: 4,000 lbs

VHF TRANSHORIZON SYSTEMS



INPUT FREQUENCY: 250 kc, 1 db bandwidth, 12 kc. minimum

POWER OUTPUT: 1.0 watt, peak envelope power

OUTPUT IMPEDANCE: 52 ohms

SIZE: 19" W, 7" D x 8¾" H

WEIGHT: 10 lbs

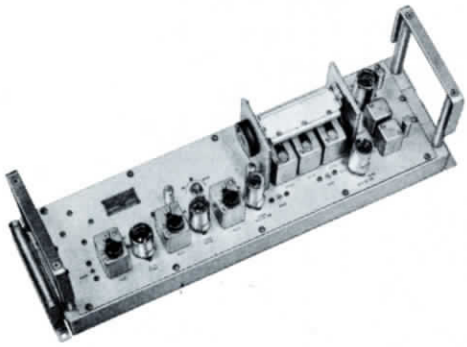
MOUNTING: Standard relay rack

AMBIENT TEMPERATURE RANGE: 0 to 50°C

310H-1 EXCITER

The 310H-1 converts a 250 kc input signal to a highly stable frequency in the 20 to 50 mc range with an RF output power of one watt. Mixer injection frequencies are furnished by an external source such as the Collins 708B-1 Stabilized Master Oscillator. Frequency stability in the exciter is dependent solely upon the accuracy of the injection frequencies. The exciter when used with the 708B-1 has an output frequency error less than 0.5 cycle/50 mc or one part in 100 million per day. Power for the exciter is also obtained from an external source.

The variable IF amplifier bandwidth is 12 kc at 1 db points. All plug-in circuits are tapped to increase trimmer tuning range. The final RF amplifier, a 4X150A, is contained in a shielding cover on the front panel. Connections to the exciter are made at the rear of the unit.



50P-1 RECEIVER

The 50P-1 consists of an RF amplifier using high Q circuits, first and second IF amplifiers and mixers. The 250 kc IF output feeds accessory equipment for recovering RTTY and voice signals. Maximum rejection of adjacent channel interference together with minimum intermodulation and crossmodulation is provided. When used with the 708B-1 SMO and 40K-1 high stability oscillator, the total frequency error is maintained at less than 1 part in 100 million (0.000001%).

FREQUENCY RANGE: 20-50 mc continuous in three bands

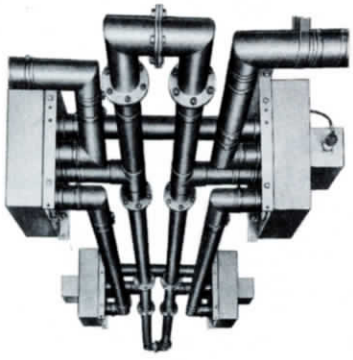
BANDWIDTH: 20 kc

TYPE OF RECEPTION: AM, CW, MCW, SSB, FSK

SIZE: 19" W, 7⅛" D, 5¼" H

AMBIENT TEMP. RANGE: 0-50°C

POWER REQUIREMENTS: Supplied from external source 250 vdc 60 ma, 12.6 vac or dc, 0.6 amps., grounded center tap



35H-1 DIPLEXER HYBRID RING

A paralleling network for operation of two 20 kw VHF transmitters for power outputs up to 40 kw. Proper phasing and amplitude adjustment is indicated by current meters. It is assembled of 3⅛" rigid coaxial fittings and supported by hangars from overhead structural members.

FREQUENCY RANGE: 36-42 mc

PERFORMANCE: 20 db minimum isolation between transmitters. 1.2 maximum VSWR over frequency range. 18 db minimum ratio of power in antenna to power in load.

IMPEDANCE: Output and input 51.5 ohms

DIMENSIONS: (assembled): 4'3½" W, 17'3" L

WEIGHT: 400 lbs

35L TRANSMITTER LINE FILTER

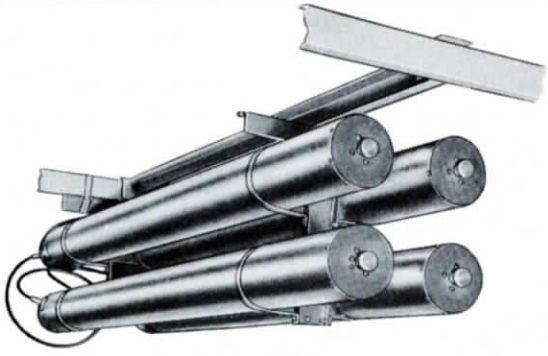
A two section filter constructed of 3⅛" rigid coaxial line connected by quarter wave length section of 3⅛" rigid coaxial line. Supported from overhead structural members.

FREQUENCY RANGE: 35L-1 nominal 40.55 ±.5 mc
35L-2 nominal 36.55 ±.5 mc

PERFORMANCE: Rejection notch attenuation not less than 50 db. Bandwidth at 40 db points not less than 150 kc

IMPEDANCE: Input and output 51.5 ohms

WEIGHT: 150 lbs



35M-1 RECEIVER LINE FILTER

Construction is four sections of quarter wave length lines utilizing 6⅛" rigid coaxial cable connected by quarter wave length sections of RG-8/U cable. Assembly supported from overhead structural members.

FREQUENCY RANGE: 35M-1 nominal 36.55 ±.5 mc
35M-2 nominal 40.55 ±.5 mc

PERFORMANCE: Skirted attenuation not less than 80 db 2 mc off resonance. Insertion loss not more than 2 db

IMPEDANCE: Input and output 51.5 ohms

WEIGHT: 360 lbs

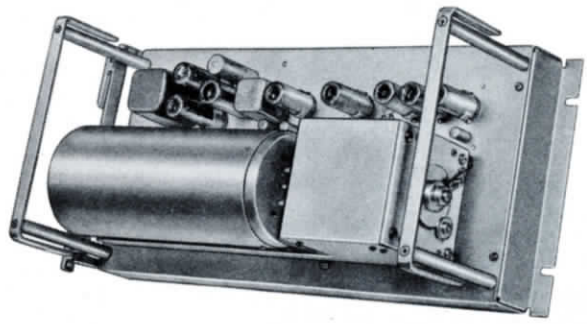
40K-1 HIGH STABILITY OSCILLATOR

The 40K-1 is used as a secondary frequency standard or a base frequency generator in frequency synthesizers, stabilized master oscillators, etc. A 1 mc resonator, with a Q of over one million, sealed in an evacuated glass envelope is used as the frequency control element.

FREQUENCY STABILITY: ± 1 part in 10^8 per day

OUTPUT VOLTAGE: 2v rms into 5,000 ohms

SIZE: 19" W, 8¾" H, 7" D standard relay rack mounting



708B-1 STABILIZED MASTER OSCILLATOR

Collins 708B-1 supplies two highly stable mixer injection signals to VHF equipments operating in the 20-50 mc range. Two RF inputs at 100 kc and 10 kc are required (40K-1 and 8U-1). Interchangeable plug-in coil assemblies are supplied to cover desired bands of operation.

OUTPUT FREQUENCY RANGE:

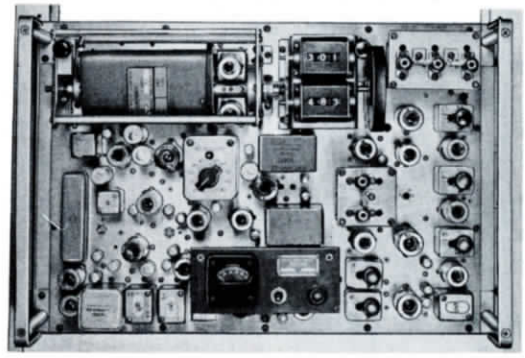
LF INJ OUTPUT — Range 1: 2.025 to 3.025 mc in 1 kc steps
Range 2: 3.025-4.000 mc in ⅝ kc steps
Range 3: 2.500-3.141 mc in ⅝ kc steps

HF INJ OUTPUT — Range 1: 18.225-27.225 mc in 9 kc steps
Range 2: 27.225-36.000 mc in 9 kc steps
Range 3: 37.500-47.115 mc in 9⅜ kc steps

OUTPUT POWER:

LF INJ OUTPUT — 2-3v rms with 3' RG-58C/U cable terminated with 470 ohms

HF INJ OUTPUT — 2-3v rms with 3' RG-58C/U cable terminated with 52 ohms



POWER REQUIREMENTS FROM EXTERNAL SOURCE: 12.6v 3.45 amp, ac or dc, center tap grounded. 160vdc, 150 ma

INPUT SIGNAL REQUIREMENTS: 10kc at level of 2 v rms across 100,000 ohms
100 kc at level of 2v rms across 100,000 ohms

SIZE: 19" W, 7" D, 12¼" H

54M-1 FREQUENCY COMPARATOR

The 54M-1 samples frequencies of any two of three 1 mc signals or compares the tenth harmonic of the 100 kc signal with any one of three mc signals. It may be used to compare the output of three Collins 40K-1 High Stability Oscillators. The frequency difference between two compared channels is indicated on a front panel meter. Aural monitoring is also provided.

RF INPUT VOLTAGE: 1 mc input: between 1.3 & 10 volts rms into a 40 uufd capacitive load 100 kc input: between 1 & 5 volts rms

POWER REQUIREMENTS: 250/300 vdc ma. 150 vdc regulated 6.3 v 50-60 cps ac 1½ amps

DIMENSIONS: 7" D, 19" W, 7" H

8U-1 FREQUENCY DIVIDER

The 8U-1 provides a 1 mc, 100 kc and 10 kc output when driven from a 1 mc signal source. The outputs are both phase and frequency stable and are intended for use in frequency synthesizers and stabilized master oscillators. The voltage levels of all three outputs are adjustable.

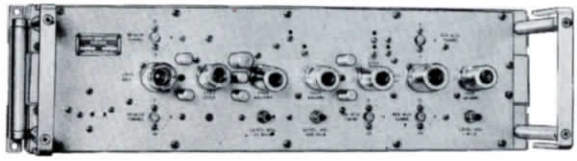
POWER SOURCE: 426A-1. +300 dc, 60 ma; 6.3 vac or dc, 2.1 a

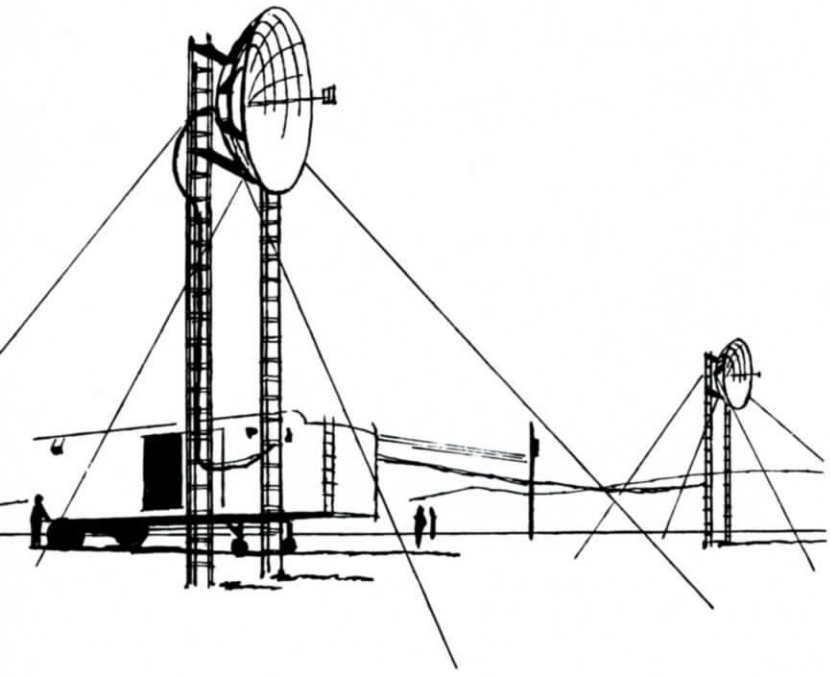
OUTPUT VOLTAGES: 0-2 v rms at 1 mc; 0-5 v rms at 100 kc; 0-5 v rms at 10 kc

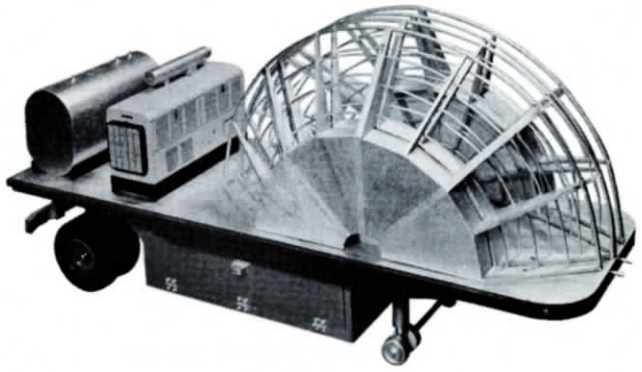
OUTPUT IMPEDANCE: Approximately 500 ohms

INPUT SIGNAL REQUIRED: 1 to 10 v rms at 1 mc

SIZE: 19" W, 5$\frac{7}{32}$" H, 7" D





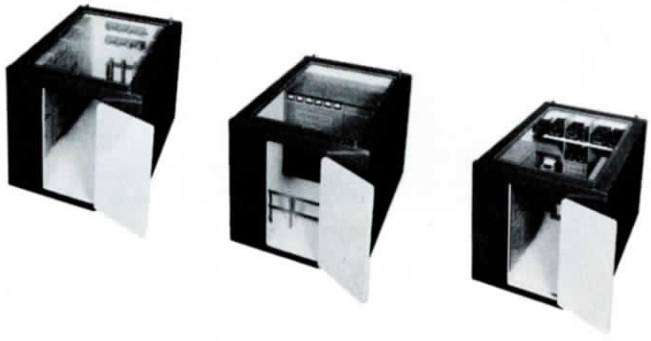


GROUND TRANSPORTABLE

The TST-101 1 kw UHF Transportable Scatter System consists of a self-contained 700-1,000 mc transmitting/receiving station in a 31-foot van type trailer. A separate flat bed antenna and power trailer carries two demountable 15 foot parabolic antennas and a 37 kva diesel electric set and associated fuel tank. Each trailer includes the following major equipments and facilities: 1 kw UHF transmitter; dual diversity receiving equipment; Collins multiplex equipment to meet channeling requirements; two complete antenna systems; auxiliary HF communication equipment and a combination 6-ton air conditioner-heater. Facilities for storing spares and performing maintenance are provided in the radio trailer.

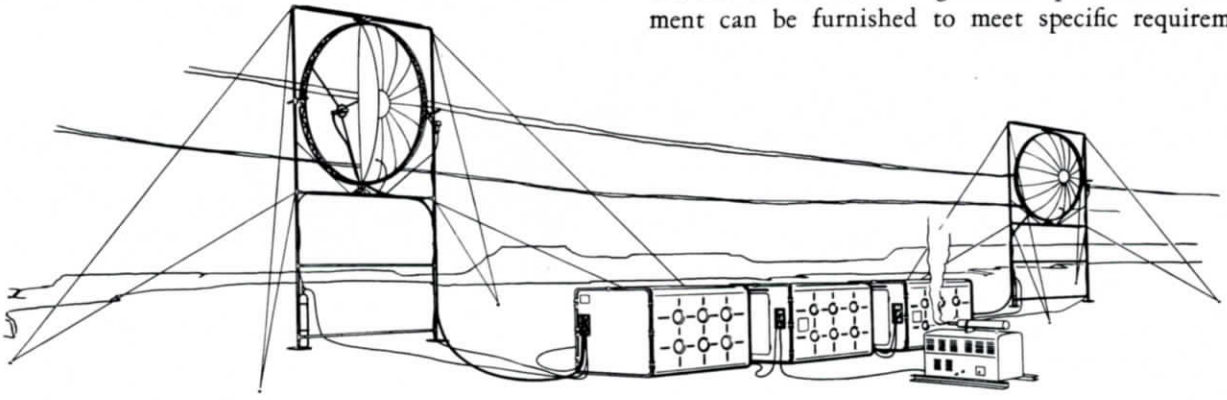
van is also available. It is similar to the 1 kw system described above with the exception that no flat-bed power/antenna trailer is included.

TRANSPORTABLE TRANSHORIZON SYSTEMS



AIR TRANSPORTABLE

The UHF 1 kw Air Transportable Scatter duplex system consists of two shelters and an engine generator trailer. One of the shelters contains the exciter, dual diversity receivers and necessary transmitting and receiving filters. The other includes the 1 kw klystron power amplifier. Stored within the shelters during transit are dollies and lifts for loading and unloading from an aircraft or truck, plus two 15-foot inflatible parabolic antenna systems. The shelters and power unit can be carried in aircraft the size of a C-119 or larger. Multiplex terminal equipment can be furnished to meet specific requirements.



Collins COMPONENTS

The degree of precision and reliability of Collins products requires development by Collins engineering of components such as the Autotune®, Autopositioner®, precision tuned oscillators, heat reducing tube shields, Mechanical Filters and ferrites. These and other high quality components are marketed by a Collins subsidiary, Communication Accessories Company of Hickman Mills, Missouri.

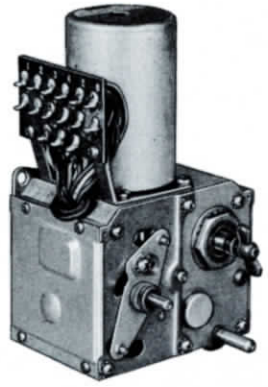
The Collins Autotune® and Autopositioner®, for example, have eliminated the need for multiple transmitters and receiver installations since channel-changing time was reduced to seconds. Research in linear tuning resulted in Collins line of permeability-tuned oscillators, each of which includes a patented internal corrective mechanism to provide linearity throughout the course of the tuning. Collins heat reducing tube shield has made an important contribution to equipment reliability by reducing bulb hot spot temperature rise and extending miniature tube life. Collins Mechanical Filter permits receiver selectivity previously unobtainable without involving space-consuming tuned IF stages. Requirements for extremely temperature stable and reproducible ferrite cores caused Collins entry into the magnetic material field, and cores are now being produced that meet the most rigid specifications.

C-A-C

PRODUCT APPLICATION BY

COMMUNICATION ACCESSORIES COMPANY

HICKMAN MILLS, MISSOURI



496A, C

VARIABLE SETTINGS (CHANNELS): 10 automatic* (can be set manually on any channel when unlocked)

USABLE OUTPUT SHAFT ROTATION:
496A — 360°
496C — 330° or other

DIRECTION OF ROTATION: 496A — clockwise only; viewed from front
496C — reversing

CLUTCH TORQUE: 4 pound-inches or less; up to 6 pound-inches with special design

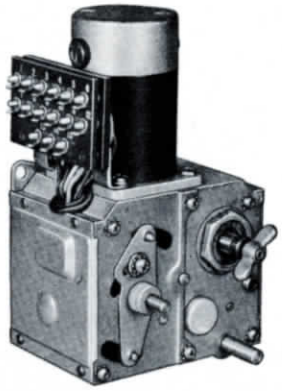
NORMAL OPERATE TIME: 6 seconds or less

WEIGHT: 3 pounds

RESET ACCURACY: 0.05 angular degrees

POWER SOURCE: 115 volts ac, 50/60 cycle (capacitor type motor)

*Additional channels by special design



496B

VARIABLE SETTINGS (CHANNELS): 10 automatic* (can be set manually on any channel when unlocked)

USABLE OUTPUT SHAFT ROTATION: 360° (unidirectional model)

DIRECTION OF ROTATION: Unidirectional (clockwise viewed from front — reversible by special design)

CLUTCH TORQUE: 4 pound-inches or less

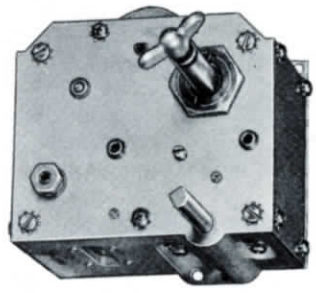
NORMAL OPERATE TIME: 3 seconds or less

WEIGHT: 3 pounds

RESET ACCURACY: 0.05 angular degrees

POWER SOURCE: 28 volts dc

*Additional channels by special design



96T, V, X

VARIABLE SETTINGS (CHANNELS): 10 automatic* (96V and X), 8 Automatic (96T) (can be set manually on any channel when unlocked)

EXTENT OF OUTPUT SHAFT ROTATION: 10 turns or less (nominal)

DIRECTION OF ROTATION: Reversing

CLUTCH TORQUE: 4 pound-inches or less

NORMAL OPERATE TIME: 10 seconds or less

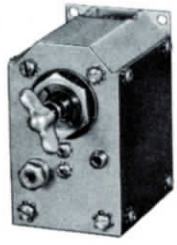
WEIGHT: 96T and V — 1¾ pounds, 96X — 2¼ pounds

RESET ACCURACY: 0.05 angular degrees

CONTROL UNITS: Used with:
96T — 111A or 111E
96V — 111B or 111F
96X — 111C or 111D

*Additional channels by special design

AUTOTUNES®



96S, U, W

VARIABLE SETTINGS (CHANNELS): 10 automatic (96U and W) or 8 Automatic (96S)

OUTPUT SHAFT ROTATION: 1 turn or less (nominal)

DIRECTION OF ROTATION: Reversing

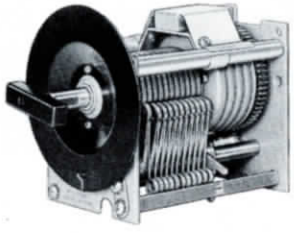
CLUTCH TORQUE: 6 pound-inches or less

NORMAL OPERATE TIME: 6 seconds or less

WEIGHT: 96S and U — 1 lb, 96W — 1½ lbs.

RESET ACCURACY: 0.05 angular degrees

CONTROL UNITS: Used with:
96S — 111A or 111E
96U — 111B or 111F
96W — 111C or 111D



96L

VARIABLE SETTINGS (CHANNELS): 11 automatic, 1 manual

EXTENT OF ROTATION: 1 turn or less (nominal)

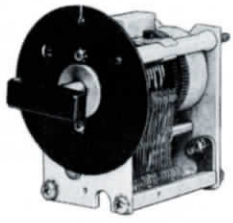
DIRECTION OF ROTATION: Reversing

CLUTCH TORQUE: 24 pound-inches or less

NORMAL OPERATE TIME: 6 seconds or less

WEIGHT: 5½ pounds

RESET ACCURACY: 0.1 angular degrees



96J

VARIABLE SETTINGS (CHANNELS): 11 automatic, 1 manual

EXTENT OF ROTATION: 1 turn or less (nominal)

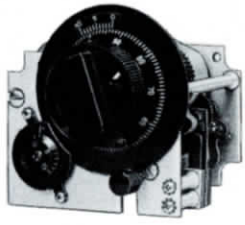
DIRECTION OF ROTATION: Reversing

CLUTCH TORQUE: 7 pound-inches or less

NORMAL OPERATE TIME: 12 seconds or less

WEIGHT: 1½ pounds

RESET ACCURACY: 0.1 angular degrees



96K

VARIABLE SETTINGS (CHANNELS): 11 automatic, 1 manual

OUTPUT SHAFT ROTATION (NOMINAL): 20 turns or less

DIRECTION OF ROTATION: Reversing

CLUTCH TORQUE: 2 pound-inches or less*

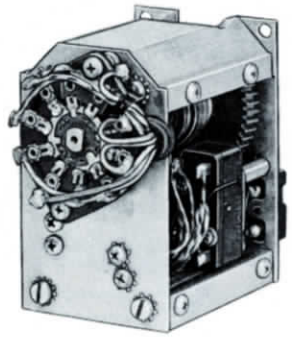
NORMAL OPERATE TIME: 20 seconds or less

WEIGHT: 2 pounds 5 ounces

RESET ACCURACY: 0.1 angular degrees

*Increased torque available if output shaft is geared down.

AUTOTUNE® CONTROL UNITS

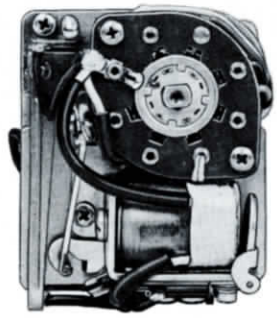


WEIGHT: 111D — ¾ lb.; 111E — ½ lb.

CONSTRUCTION: Corrosion resistant steel end plates and separating aluminum castings

CONNECTIONS: Built-in terminal board, plug or cable with plug

CONTROL UNITS: Used with: 111D — 96W or 96X; 111E — 96S or 96T; 111F — 96U or 96V



WEIGHT: ¾ pound

CONSTRUCTION: Steel plates with separating aluminum castings

POWER SOURCE: 24 volts dc (for relay)

CONNECTIONS: Built-in plug board or cable with plug attached

CONTROL UNITS: Used with: 111A — 96S or 96T; 111B — 96U or 96V; 111C — 96W or 96X

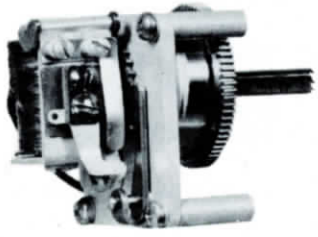
WEIGHT: ¾ pound

CONSTRUCTION: Aluminum and steel end plates with separating aluminum standoffs.

MOUNTING: Three point mounting by screws in rear plate.

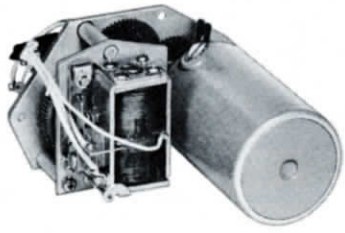
RECOMMENDED LINE SHAFT SPEED: 1200—1500 RPM

AUTOPOSITIONERS®



The Autopositioner® is a motor driven mechanism which will accurately reset a shaft to any of several fixed evenly spaced positions. It is remotely controllable over electrical circuits and is fast, quiet, and built for long, dependable service. It has been utilized in high quality military and commercial equipments and is applicable to the design of many other industrial equipments.

Autopositioners® are available for operation from ac or dc voltage.



The Packaged Autopositioner® incorporates the Autopositioner® head, motor, gear train and seeking switch in one easily mounted assembly. Engineering samples are available.

POSITIONS: Up to 28 (more by gearing)

EXTENT OF ROTATION: Continuous

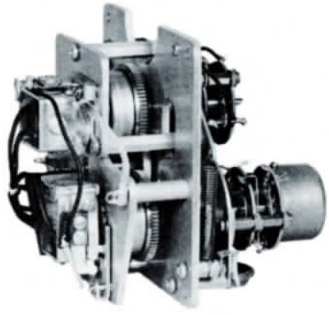
DIRECTION OF ROTATION: Either direction (counter clockwise preferable — facing output shaft)

TORQUE: 6 inch lbs or less

NORMAL OPERATE TIME: 0.1 sec. per position

WEIGHT: 10 oz (unmounted without motor)

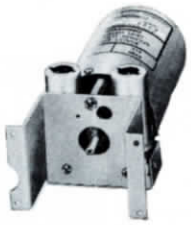
RESET ACCURACY: Up to 0.05 degrees



Multiple-head Autopositioners® are used for control or indicating systems in which it is necessary to set the position of a rotary shaft in accordance with a binary number which may be the output of a counter, computer or similar device.

By interconnecting several Autopositioner® units either electrically or mechanically, a wide variety of control applications can be provided. Reversing rotation can be supplied by special design.

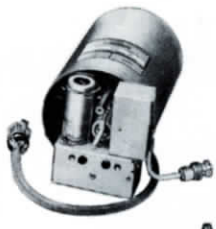
70E-1



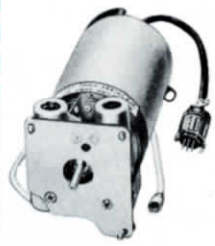
70E-12

70E-15

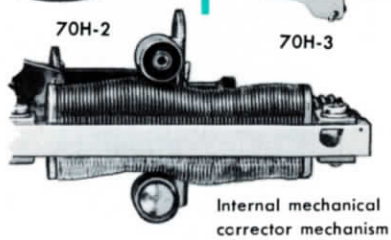
70E-20



70H-2



70H-3



Internal mechanical corrector mechanism

OSCILLATORS

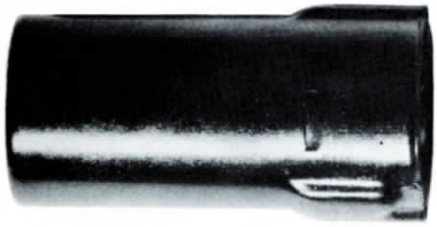
Collins Precision Tuned Oscillators provide accurate, linear dial calibration and superior frequency stability. They are mechanically stable, sealed against atmospheric changes and compensated for variations in temperature and voltage.

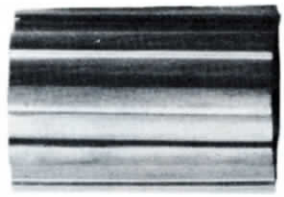
Each oscillator is individually tested and calibrated to a linear scale by adjusting an internal mechanical corrector mechanism. This mechanism controls the differential rate at which the tuning core advances into the coil as the tuning shaft is rotated, thereby permitting very accurate calibration. The linear frequency characteristic enables all dial divisions to be equally spaced.

All possible stabilizing measures such as sealed tank capacitors, coil and core impregnation, and hermetic sealing have been incorporated. Tuning elements are mechanically loaded to insure a high order of reset accuracy and virtually eliminate the effects of shock and vibration.

TYPE	70E-1	70E-12	70E-15	70E-20	70H-2	70H-3
Frequency Range / **Calibration Linearity**	1.0—1.5 mc ±750 cycles	1.955—2.955 mc ±1000 cycles	2.0—3.0 mc ±750 cycles	1.65—2.05 mc ±500 cycles	2.455—3.455 mc ±500 cycles	1.5—3.0 mc ±1000 cycle
Maximum Frequency Drift 40° F to 120° F	250 cycles	600 cycles	400 cycles	400 cycles	100 cycles oven on	600 cycles
Max. Drift with ±10% Plate Voltage Change	75 cycles	150 cycles	150 cycles	75 cycles	100 cycles	100 cycles
RF Output	13—30v rms 25 mmf load	1.5—2.0v rms 15 mmf load	1.2—2.5v rms 100 mmf load	5.5—12v rms 33 mmf load	2v rms 1000 ohm load	5—13v rms no load
Plate Power	250v @ 7 ma	150v @ 12 ma	150v @ 12 ma	210v @ 20 ma	180v @ 10 ma	150v @ 12 ma
Heater Power	12.6v @ 150 ma	6.3v @ 600 ma	6.3v @ 600 ma	6.3v @ 600 ma	6.3v @ 300 ma	12.6v @ 300 ma
Oven Power	none	none	none	none	26v @ 2.0 amp*	26v @ 3.0 amp**
Electrical Connections	plug	solder	solder	plug	plug	plug
Tubes	one 12SJ7	two 6BA6	two 6BA6	two 5749	one 5749	two 5749
Shaft Size	0.1869—0.1873	0.1869—0.1872	0.1869—0.1872	0.1869—0.1872	0.1869—0.1872	0.1869—0.1872
Rotation for Increased Frequency	clockwise	counter-clockwise	counter-clockwise	clockwise	counter-clockwise	counter-clockwise
Tuning Rate	50 kc/turn	100 kc/turn	100 kc/turn	25 kc/turn	100 kc/turn	150 kc/turn
Tuning Torque	3—4 inch oz	10 inch oz	10 inch oz	10 inch oz	10 inch oz	10 inch oz
Size	2¾" sq x 5"	2½" dia x 6 1/16"	2½" dia x 5"	2½" dia x 6½"	3½" dia x 65/32"	2 27/32" dia x 65/16"

*Thermostatically controlled at 167°F.
**Thermostat does not permit oscillator temperature to fall below 33°F.





The 66J includes:

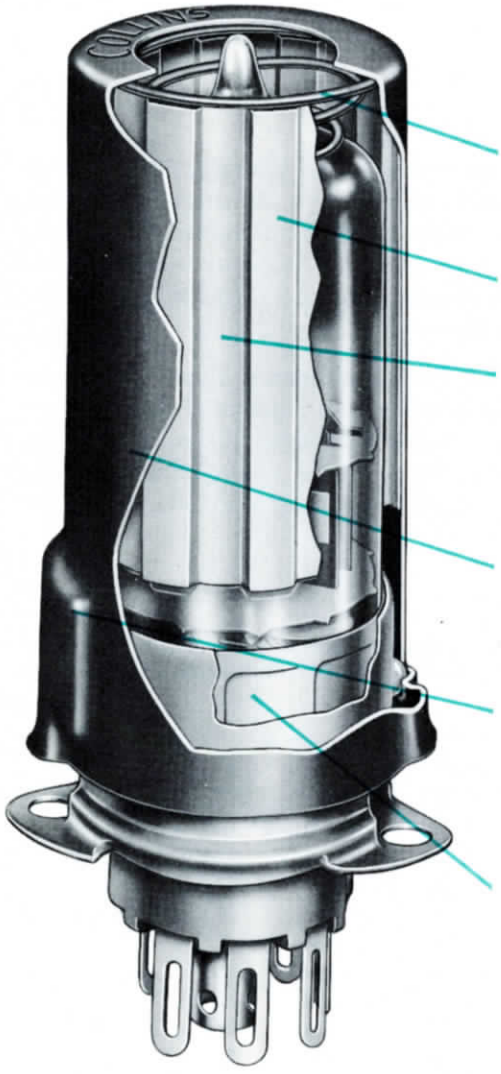
1. An outer shell coated with a special black conducting finish and including the standard JAN holddown spring and bayonet base.

2. A corrugated liner of silver-plated beryllium copper which grips the bulb. Liner is captivated in outer shell.

3. A base liner of plated beryllium copper with tabs punched inward for intimate contact with the base of the tube.

NOTE: Tube socket is shown for illustrative purposes only and is not supplied.

HEAT REDUCING TUBE SHIELDS*



FEATURES

Interchangeable with standard JAN shield—existing equipment can readily be retrofitted.

Tube hold-down spring of standard JAN shield is used. Tube cannot work out of socket through long-term vibration.

Tube is securely held in place in sideways direction against vibration and shock.

Construction: Heat-treated beryllium copper corrugated liner and socket insert are highly resilient and will accommodate wider variations in tube diameter.

Maximum electrostatic shielding.

Special black finish provides greater heat dissipation.

Shield assembly is easily inserted and removed from the tube.

Convenient bayonet hold-down feature of the standard JAN shield is retained.

Corrugated liner is captivated in the shield, will not fall out when shield is removed.

Base liner reduces bulb temperature in the most critical area of the tube.

Collins 66J Heat Reducing Tube Shield can lower bulb hot spot temperature rise above ambient to 55 per cent of former values. Unique feature of the 66J is that it not only gives excellent protection at the middle and top of the tube, but also in the critical base area where electrolysis occurs at the metal-to-glass junction.

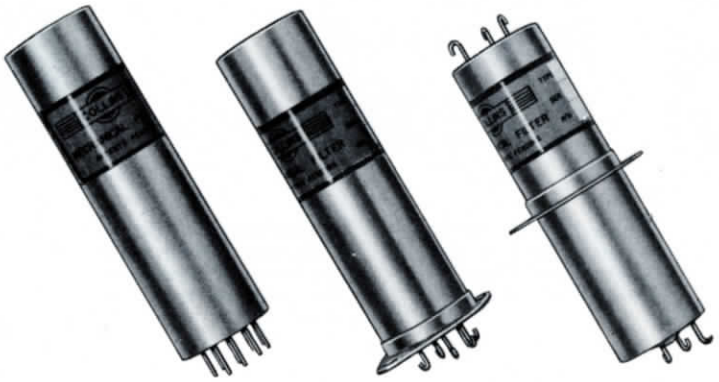
Current information indicates that the 66J can reduce tube failures to less than one-half of failures encountered using tubes with shiny JAN shields. Because of the resiliency of the heat treated beryllium copper liner, the 66J accommodates wide variations in tube diameter and also protects against damaging shock and vibration. The shield liner itself is captivated within the shield by two lanced tabs in the sides of the shield. Interchangeable with the standard JAN, the 66J is ideal for both current design and retrofitting.

TYPES AND SIZES

Collins Shield Type Number (This includes shield, corrugated liner & base liner)	Equivalent Jan Shield No.	Height of Shield	Tube Size
66J-1	TS-102U01	1 3/8	7-Pin Short
66J-2	TS-102U02	1 3/4	7-Pin Medium
66J-3	TS-102U03	2 1/4	7-Pin Large
66J-4	TS-103U01	1 1/2	9-Pin Short
66J-5	TS-103U02	1 15/16	9-Pin Medium
66J-6	TS-103U03	2 3/8	9-Pin Large

*Patent Pending

Typical Mechanical Filter cartridge before insertion into case. The case is then hermetically sealed.



Case and mounting styles of Filters include the above and combinations thereof. For detailed drawings, see facing page.

MECHANICAL FILTERS

The Collins Mechanical Filter is an electro-mechanical bandpass Filter which surpasses, in one small unit, the selectivity of conventional, space-consuming filters. As shown in the Mechanical Filter functional diagram below, it consists of an input transducer, a resonant mechanical section comprised of a number of metal discs and coupling rods, and an output transducer.

Magnetostrictively-driven Mechanical Filters have several advantages over electrical equivalents. The mechanical elements are extremely small, and a Filter having better selectivity characteristics than the best of conventional IF systems is enclosed in a package smaller than a single IF transformer.

Since mechanical elements with Q's of 5,000 or over are readily obtainable, these Filters are designed in accordance with the theory of lossless elements. Performance unobtainable with electrical circuits, because of the relatively high losses in electrical elements, is characteristic of these Filters.

The Mechanical Filter's frequency characteristics are permanent. No adjustment is required or provided and the Filter is enclosed in a hermetically sealed case. This presents an important step in reduction in servicing complexity in today's complicated electronic equipment.

THE FOLLOWING TABLE is a summary of major characteristics of standard Mechanical Filters currently in production or available on special order. Sample and production quantity quotations and detailed specifications for any of the standard Filter designs will be supplied on request.

Type	Center Frequency	6 db Bandwidth	60 db Bandwidth	Case Style
F250A-20	250 kc	2.0 kc	4.5 kc	C
F250A-67	250 kc	6.7 kc	13.4 kc	C
F250A-85	250 kc	8.5 kc	17.0 kc	C
F250Z-3	250 kc	2.7 kc	4.1 kc	W
F250Z-4	252 kc	3.2 kc	5.4 kc	C
F250Z-5	248 kc	3.2 kc	5.4 kc	C
F455*-05	455 kc	0.5 kc	2.5 kc	*
F455*-15	455 kc	1.5 kc	3.5 kc	*
F455*-21	455 kc	2.1 kc	5.0 kc	*
F455*-31	455 kc	3.1 kc	6.5 kc	*

Type	Center Frequency	6 db Bandwidth	60 db Bandwidth	Case Style
F455*-60	455 kc	6.0 kc	12.0 kc	*
F455*-120	455 kc	12.0 kc	22.0 kc	*
F455*-160	455 kc	16.0 kc	27.5 kc	*
F455*-350	455 kc	35.0 kc	56.0 kc	*
F455Z-1	456.8 kc	3.3 kc	5.3 kc	H
F455Z-2	453.2 kc	3.3 kc	5.3 kc	H
F500B-14	500 kc	1.4 kc	3.8 kc	B
F500B-31	500 kc	3.1 kc	7.5 kc	B
F500B-60	500 kc	6.0 kc	14.0 kc	B
F500F-14	500 kc	1.4 kc	3.5 kc	F

*Applicable to F455-E, -F, -H, -J and -K Series, which have case styles (see facing page) B, F, H, J and K, respectively.
Case style Y is available for all F455 Filters except —05, —15 and Z-1 and Z-2.

GENERAL INFORMATION

TRANSMISSION LOSS: Generally, insertion losses in the order of 10 db — 12 db are obtained. Certain types of Filters have losses as low as 6 db. In applications employing series resonant input and parallel resonant output, actual voltage gains are obtained.

PEAK TO VALLEY RATIO: The passband response variations of most Mechanical Filter designs is nominally less than 3 db.

TEMPERATURE CHARACTERISTICS: Most Mechanical Filter designs employ temperature compensation and the nominal bandwidth of a given Filter is essentially unaffected by wide variations in ambient temperatures. Normally the Filter response curve can be expected to translate no more than ±10 ppm/°C. Since Mechanical Filters are hermetically sealed, humidity has no effect.

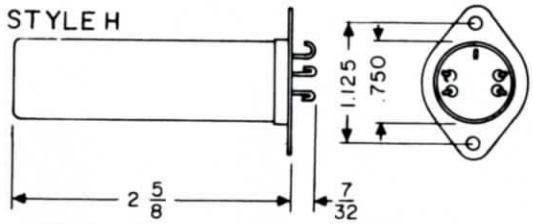
TERMINAL IMPEDANCE: Normally the Mechanical Filter is a relatively high impedance device and as such it is desirable to use source and load impedance of approximately ten times the resonant terminal impedance of the Filter. Depending on the individual Filter design, the parallel resonant terminal impedances may be from 10,000 to 50,000 ohms.

SPECIAL FILTERS: For applications requiring operating characteristics not met by "standard" designs, special Filters can be produced for frequencies in the range of 60 kc to 600 kc.

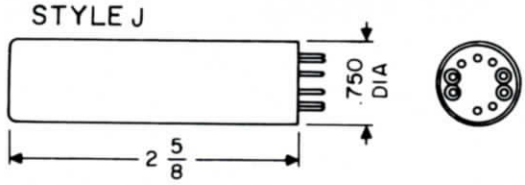
ADDITIONAL BULLETINS are available on standard Mechanical Filters, and design objective technical data can be supplied on any filter requirement in the range of 100 kc to 500 kc. Please include full details of your filtering problems and address your inquiry to Communication Accessories Co., Hickman Mills, Mo.

CASE STYLES

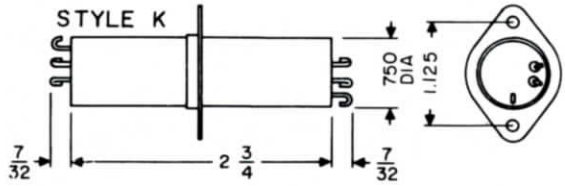
STYLE H



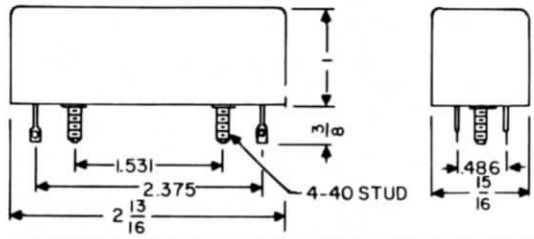
STYLE J



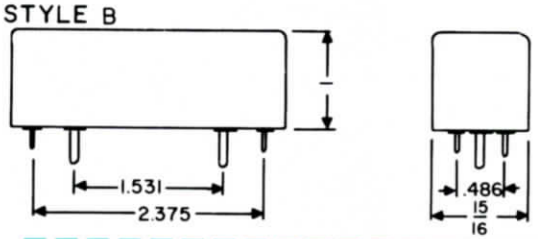
STYLE K



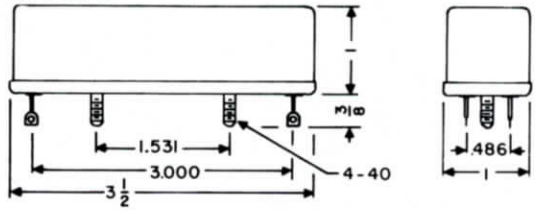
STYLE F



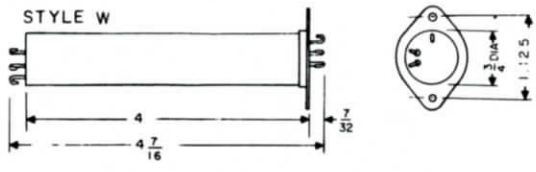
STYLE B



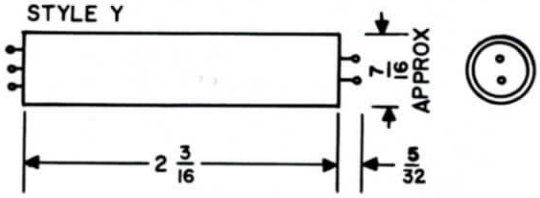
STYLE C



STYLE W

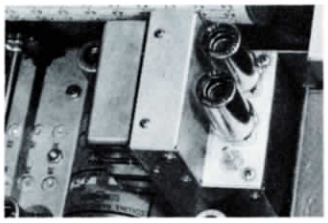


STYLE Y

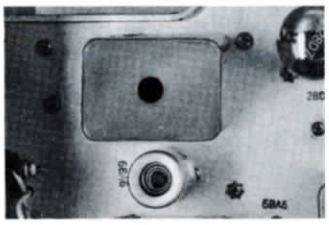


MECHANICAL FILTER CONVERSION KITS

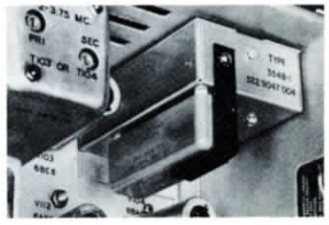
Use of a conversion kit is a means for convenient and permanent modification that will result in significantly improved IF selectivity. Kits include all electrical and mechanical parts, schematics and installation diagrams.



For 51J-3 Receiver and 51J-2's above Ser. No. 500. Choice of up to three Filter response characteristics.



For 51N-2 Receiver. Provision for single plug-in Filter for steep selectivity of desired bandwidth.



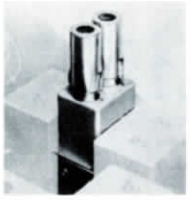
For 18S-4 airborne Transmitter-Receiver. Includes built-in 6 kc Filter.

MECHANICAL FILTER ADAPTERS

These adapters are self-contained plug-in units about the size of an IF transformer, containing Filter, two IF amplifier tubes and a tube-type connector for plugging into either first or second IF socket.

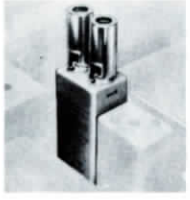
353A For Hammarlund SP-400, National HRO-60.

Mechanical Filter Adapter Type	Filter Type Used	Bandwidth At −6 db
353A-08	F455D-08	0.8 kc
353A-12	F455D-12	1.2 kc
353A-31	F455D-31	3.1 kc
353A-60	F455D-60	6.0 kc



353B For Hammarlund SP-600-JX.

Mechanical Filter Adapter Type	Filter Type Used	Bandwidth At −6 db
353B-08	F455D-08	0.8 kc
353B-12	F455D-12	1.2 kc
353B-31	F455D-31	3.1 kc
353B-60	F455D-60	6.0 kc



353C For 75A-1 Receiver.

Mechanical Filter Adapter Type	Filter Type Used	Bandwidth At −6 db
353C-14	F500A-14	1.4 kc
353C-31	F500A-31	3.1 kc
353C-60	F500A-60	6.0 kc

353D For National HRO-50, HRO-50T1.

Mechanical Filter Adapter Type	Filter Type Used	Bandwidth At −6 db
353D-08	F455D-08	0.8 kc
353D-12	F455D-12	1.2 kc
353D-31	F455D-31	3.1 kc
353D-60	F455D-60	6.0 kc

353E-1 For 51J-3 and 51J-2's above Ser. No. 500.

Contains jacks to receive one of three Filters (F500B Series). Change of Filter only is required.

Mechanical Filter Adapter Type	Filter Type Used	Bandwidth At −6 db
353E-1	F500B-14	1.4 kc
	F500B-31	3.1 kc
	F500B-60	6.0 kc

Collins PRECISION FERRITES

Collins is now producing different types of ferrite cores that cover the frequency range from 2 kc to 100 mc.

These cores are formed from high purity and chemically analyzed metallic oxides, strictly controlled by specialists using the most advanced techniques.

Cores with a temperature coefficient of initial permeability of 0.02%/°C maximum from 20°C to 80°C and an initial permeability of 200 are being produced. Special pressing techniques have produced a ferrite tuning core with uniform permeability along its entire length.

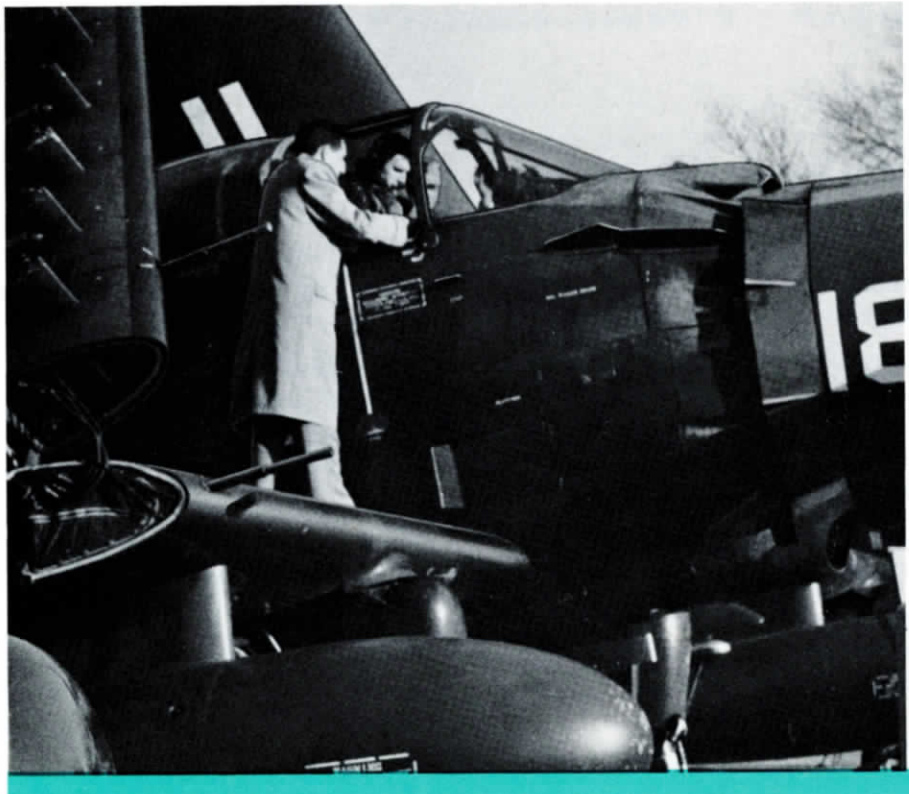
Ferrites are available as rods, plates, tuning slugs, toroids, hollow cores and pot cores. Special shapes are available on request.

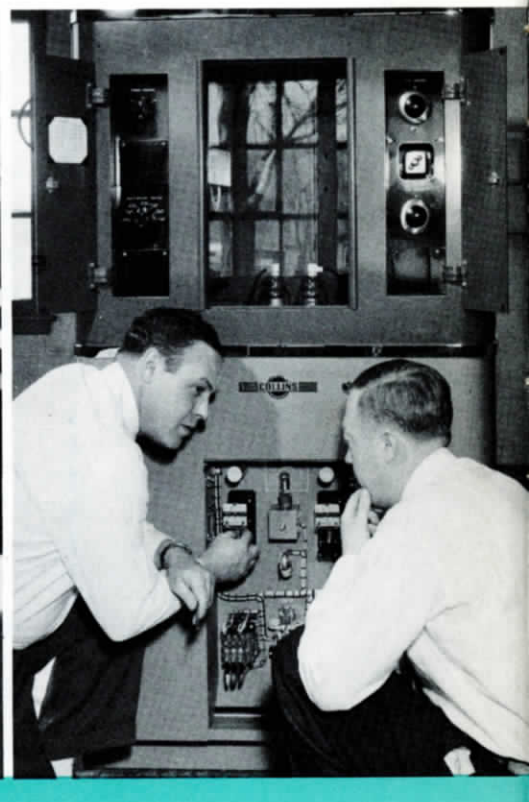
Additional bulletins and design objective technical data are available from Communication Accessories Company, Hickman Mills, Missouri.

FIELD SERVICE ORGANIZATION

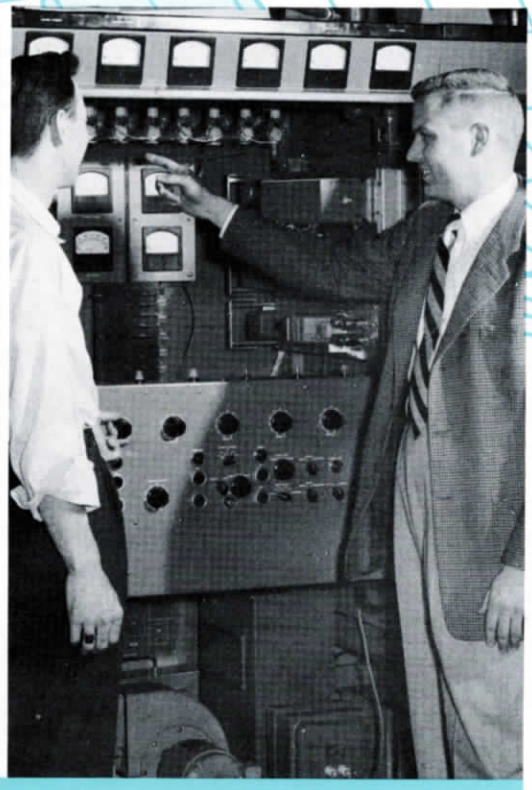
Service

Backing up Collins electronic products is a seasoned field service organization, Collins trained and tested. Numbering nearly 200, this organization stands ready to insure proper performance, provide technical instruction, install new equipment or modernize existing installations, and maintain technical liaison. Field service facilities are located in Dallas, Cedar Rapids, Burbank, Washington, D. C., New York City, Miami, Toronto and London, with field engineers traveling to other points throughout the world. Collins is exacting in maintaining the same high standards in its field service staff that it does in its product.





After Sales



Litho in U.S.A.