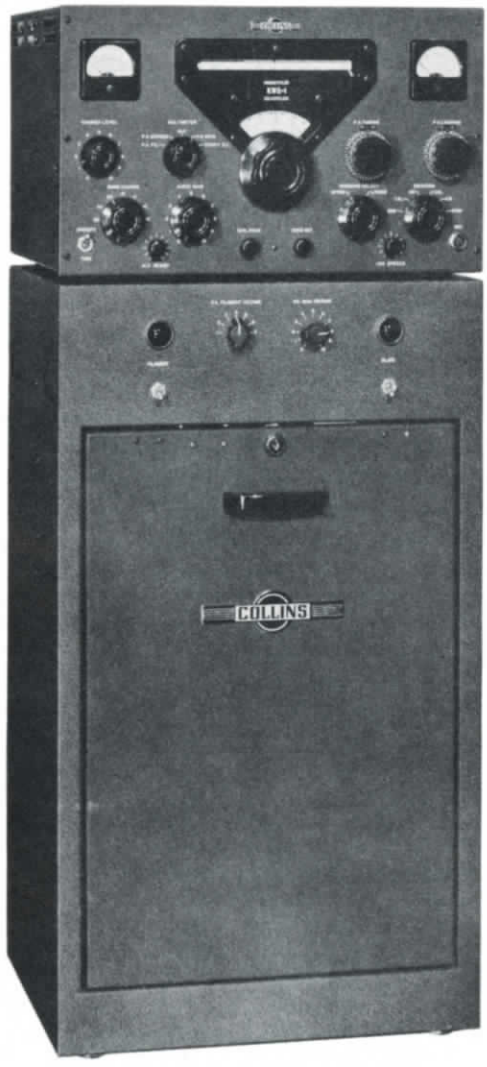
Collins SSB AMATEUR COMMUNICATION

Collins new single sideband equipment has introduced a new era in Amateur performance. The equipment described in this section is the top performing gear on the air, including the kilowatt KWS-1 Transmitter, highly selective 75A-4 Receiver and the 100 watt mobile/fixed KWM-1 Transceiver.

Collins engineering of Amateur equipment dates back to the early 1930's. Through the years these radios have been the most prized equipment in the Amateur Fraternity. Many have been used for professional purposes. The reputation of this equipment line has often served as Collins best advertising, introducing the Collins performance to many of the electronic industries leaders who began their careers as ham operators.

KWS-1 TRANSMITTER



Unprecedented compactness is achieved without undue crowding. Exciter and RF power amplifier are in a single receiver-size housing which can be placed on the operating desk or mounted on top of the power supply cabinet. Proved circuit applications and components — extremely accurate 70E VFO, Pi-L output network and Collins Mechanical Filter — give you unmatched performance, accuracy and stability in SSB, AM and CW operation.

POWER AMPLIFIER INPUT: 1 kw peak envelope power SSB, 1 kw CW operation. Equivalent to 1 kw on AM when using narrow bandwidth receiver.

RF OUTPUT IMPEDANCE: 52 ohms

FREQUENCY RANGE: 80, 40, 20, 15, 11, 10 meters

EMISSION: SSB, AM carrier plus one sideband, CW

FREQUENCY CONTROL: 70E-23 Master Oscillator

HARMONIC AND SPURIOUS RADIATION: (Other than 3rd order distortion products.) Intra-channel radiation is at least 50 db down. All spurious radiation at least 40 db down at output of exciter. Second harmonic at least 40 db down; all other harmonics at least 60 db down

DISTORTION: SSB, 3rd order products approximately 35 db down at 1 kw PEP

FREQUENCY STABILITY: Warmup: After 15 minutes warmup, within 300 cps of starting frequency. Dial Accuracy: 350 cps after calibration

AUDIO CHARACTERISTICS: Response: ±3 db, 200 to 3,000 cps. Noise and hum: 40 db or more below reference output level. Input: .01 volts for rated power output

MICROPHONE INPUT: Will match high impedance dynamic or crystal

PHONE PATCH IMPEDANCE: 600 ohms, unbalanced to ground

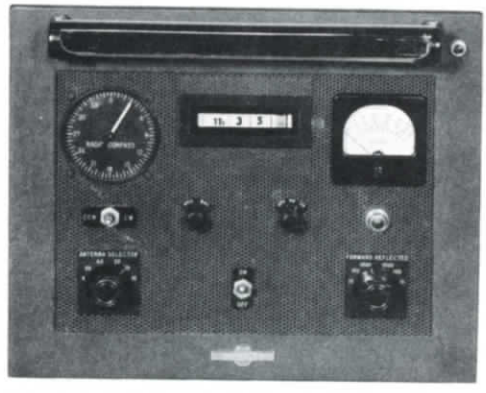
CIRCUIT PROTECTION: Overload relay and fuses

SIZE: 40½" high, 17¼" wide, 15½" deep

POWER SOURCE: 230 v, 3 wire, 50/60 cycle, single phase, grounded neutral: or 115 v, 2 wire, 50/60 cycle, single phase. 1500 w 1 kw input CW

SC-101 CONTROL

The SC-101 provides the necessary equipment to connect the Transmitter and Receiver, beam direction indicator, beam control, phone patch circuit, standing wave ratio meter and remote selection of any one of six antennas.



The System is composed of three units:

312A-2 SPEAKER/CONTROL UNIT

This desk-top unit includes a 10" speaker, beam direction indicator, SWR meter, 24-hour numeral clock, lumiline operating lamp, phone patch unit, auxiliary power supply for control circuits, and terminal boards for interconnecting all units. A synchro control unit for tower mounting is also supplied, as is a directional coupler for use with the SWR unit.

68Y-1 ANTENNA SELECTOR

Mounted on wall near desk, the 68Y includes the antenna transfer relay, two coax relays for antenna selection, mounting bracket for directional coupler and necessary interconnecting coax cables.

534A-1 WIRING DUCT AND HARNESS

This metal duct mounts along back of desk or table and houses all interconnecting cables. Along the top of the duct are ac utility outlets. Also included is a cable harness with wires necessary to connect the Transmitter, Receiver and extra control functions.

75A-4 RECEIVER

Designed for best SSB reception without sacrificing top efficiency in other modes, the 75A-4 has the top features proved in earlier models — excellent image rejection through double conversion, precise dial calibration and high stability of Collins VFO and crystal-controlled first injection oscillator, and the ideal selectivity of Collins Mechanical Filter in the IF strip.

FREQUENCY RANGE: 160, 80, 40, 20, 15, 11, 10 meters

SIZE: 10½" high, 17¼" wide, 15½" deep

RACK MOUNTING: Angle mounting kit available

NUMBER OF TUBES: 22, including rectifiers

SENSITIVITY: 1.0 uv for 6 db signal-to-noise ratio with 3 kc bandwidth

AVC CHARACTERISTICS: Audio rise less than 3 db for inputs of 5 to 200,000 uv

AVC TIME CONSTANTS: Rise Time — .01 second
Release Time: .1 second (fast), 1 second (slow)

IMAGE AND IF REJECTION: Image ratio at center of each band 50 db or better. IF rejection at center of each band 70 db or better

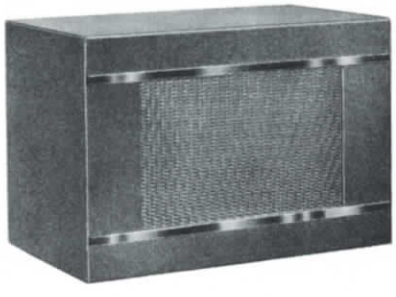
AUDIO CHARACTERISTICS: Output — .75 watts with a 3.0 uv signal, 30% modulated. Output impedance— 500 ohms, 4 ohms.
Response of audio circuits — ±3 db 100 cps to 5,000 cps
Distortion — less than 10%

MUTING: Provisions for muting the Receiver during key-down operation are provided. A muting voltage of +20 must be supplied by transmitter

FREQUENCY STABILITY (at 14 mc): Temperature — Less than 1200 cycles drift from 0 to ±60°C. Warmup drift — Less than 300 cycles after 15 minute operation. Line voltage coefficient — Less than 100 cycles for ±10% change. Dial accuracy — 350 cycles after calibration

312A-1 SPEAKER/CONTROL

The 312A-1 Speaker/Control Unit includes loudspeaker and has space for the extra control functions necessary in a complete installation. Unit is furnished with removable perforated steel front panel insert with no cut-outs; operator can remove panel and install any control functions such as beam direction indicators, clocks, switches, etc. A 10" speaker is submounted behind the front panel and a lumiline lamp above. Rear of the unit is open and across the bottom is a terminal strip.



270G-3 SPEAKER

The 270G-3 cabinet and 10" PM speaker assembly is attractively finished to match the 75A-4 Receiver. The speaker's voice coil impedance is 6-8 ohms, 8 w.

KWM-1 TRANSCEIVER

This new 14-30 mc 100 watt SSB transceiver provides complete communication for either mobile or fixed station use with no changes. Utilization of common components in both transmitting and receiving functions has resulted in a saving of both space and cost and, in the case of frequency-determining components, assures exact coincidence of transmitted and received signals. Frequency stability is comparable to that of the KWS-1/75A-4. The panel meter serves as an S-meter during receive and multi-meter during transmit. Break-in CW using VOX circuits is a built-in feature, and side tone is available for monitoring CW. For maximum simplicity and size reduction the tuning dial covers only 100 kc; 10 such bands are available anywhere in the 14-30 mc range. Crystals can be supplied to give 100 kc bands for other services such as MARS or commercial use.

The transmitter portion provides 100 watts SSB PEP (upper sideband only) or CW into a 50-ohm antenna, and combines such features as a self-adjusting ALC circuit; RF feedback for low distortion; Mechanical Filter sideband generation; built-in VOX and speaker-quieting circuits; antenna changeover relay; Pi-L output network for good harmonic suppression, and complete TVI filtering.

The receiver portion is a double conversion superheterodyne with performance characteristics similar to the 75A. Accessories available include the 516F-1 60 cycle 110vac Power Supply; 516E-1 12vdc Power Supply; 312B-1 Speaker in cabinet; 312B-2 Speaker Console, including phone patch and directional wattmeter, and Mobile Mounting Tray for snap-in installation. The dc power supply is completely transistorized, has no tubes, vibrators or dynamotors, resulting in high efficiency and very low battery drain.

SIZE: Transceiver, 6¼"H, 14"W, 10"D — 12vdc Power Supply, 4½"H, 5"W, 9"D

WEIGHT: Transceiver, 15 lbs

FREQUENCY STABILITY: ±100cps after 10-minute warmup

RESET ACCURACY: 1 kc

SELECTIVITY: 3.1 kc Mechanical Filter for both transmit and receive

DETECTION: Product detector

RF POWER INPUT: 100w SSB (PEP) or CW into 50 ohm load

PA POWER INPUT: 200w SSB (PEP) or CW

MECHANICAL FILTERS

Collins F455J-Series Mechanical Filters are available as accessories for the 75A-4 Receiver. The F455J-05 Filter, bandwidth of 500 cycles, is recommended for CW reception; the F455J-15 (1.5 kc) for RTTY; the F455J-60 (6.0 kc) for AM where interference is not a problem, and the F455J-21 (2.1 kc) and F455J-31 (3.1 kc) for AM and SSB. The F455J-31 is supplied as standard equipment in the Receiver.

GEAR REDUCTION TUNING KNOB

Collins Gear Reduction Tuning Knob provides new ease and accuracy in tuning SSB signals. Operating on a 4 to 1 ratio, the Knob eliminates the Dial Drag and has no detectable backlash. After simple installation, the Knob will provide effortless tuning of all models of the 75A series and the KWS-1.

COMPLETE STATION — FROM MIKE TO ANTENNA

Collins BROADCAST SYSTEMS

Collins supplies the broadcaster with every radio need — a complete new broadcast station, expansion, modification, expert engineering advice or modification of an existing installation.

Custom built equipment is a Collins specialty, backed by more than two decades of design experience in meeting exacting requirements. This section of the catalog shows only representative equipment of Collins broadcast line. Detailed literature on all products is available from your nearest Collins office.

Collins BROADCAST

These transmitters outperform all others in the field as a result of advanced engineering, careful construction and the most complete testing in the broadcast field.
They'll give you top performance now and grow with your facilities; Power Increase Packages are available to make a conversion overnight.

300J — 250/100 WATTS

Two instantly selectable power outputs. Simplified oscillator eliminates use of crystal oven, assures dependability. All stages are precisely metered and tubes (only seven types) are operated below rated dissipation levels for safe operation and long life.

FREQUENCY RANGE: 540-1600 kc standard (frequencies to 18 mc available)

POWER OUTPUT: 250/100 w (capable 275/110)

FREQUENCY STABILITY: Less than ±5 cps (average less than ±2 cps)

AUDIO FREQUENCY RESPONSE: Within ±1.5 db from 30 to 10,000 cps (typical ±1 db from 30-10,000)

AUDIO FREQUENCY DISTORTION: Less than 3% from 50-7500 cps for 95% modulation, including all harmonics up to 16 kc (typical — less than 2½% from 50-7500, less than 2% from 100 to 7500 cps)

RESIDUAL NOISE LEVEL: 60 db below 100% modulation

CARRIER SHIFT: Less than 3%, 0-100% modulation (typical—less than 2%)

RF OUTPUT IMPEDANCE: 75/50 ohms standard — other impedances available

AUDIO INPUT IMPEDANCE: 600/150 ohms

AUDIO INPUT LEVEL: +10 dbm ±2 db, pad input

AMBIENT TEMPERATURE RANGE: Up to +45°C

ALTITUDE RANGE: Sea level to 6,000 feet

POWER SOURCE: 208/230 v single phase 50/60 cps

POWER DEMAND: 0% modulation 1200 w, 30% modulation 1320 w, 100% modulation 1510 w (90% power factor)

WEIGHT: Approximately 900 lbs

DIMENSIONS: 38" wide, 76" high, 27" deep

550A — 500/250 WATTS

Peak performance on any frequency from 540 to 1600 kc. Features include instant power changing, stable oscillator, only seven tube types, automatic power application in proper sequence, precise metering, adaptability to remote control and easy access to interior.

FREQUENCY RANGE: 540-1600 kc standard — frequencies to 18 mc available

POWER OUTPUT: 500/250 w (capable 550/275 w)

FREQUENCY STABILITY: Less than ±5 cps, (average less than ±2 cps)

AUDIO FREQUENCY RESPONSE: Within ±1 db from 30 to 15,000 cps (typical — ±0.5 db from 30 to 15,000)

AUDIO FREQUENCY DISTORTION: Less than 3.0% from 50-7500 cps for 95% modulation, including all harmonics up to 16 kc (typical — less than 2½% from 50-7500, less than 2% from 100 to 5,000 cps)

RESIDUAL NOISE LEVEL: 60 db below 100% modulation

CARRIER SHIFT: Less than 3%, 0-100% modulation (typical—less than 2%)

RF OUTPUT IMPEDANCE: 75/50 ohms standard — other impedances available

AUDIO INPUT IMPEDANCE: 600/150 ohms

AUDIO INPUT LEVEL: +10 dbm, ±2db, pad input

AMBIENT TEMPERATURE RANGE: Up to 45°C

ALTITUDE RANGE: Sea level to 6,000 ft.

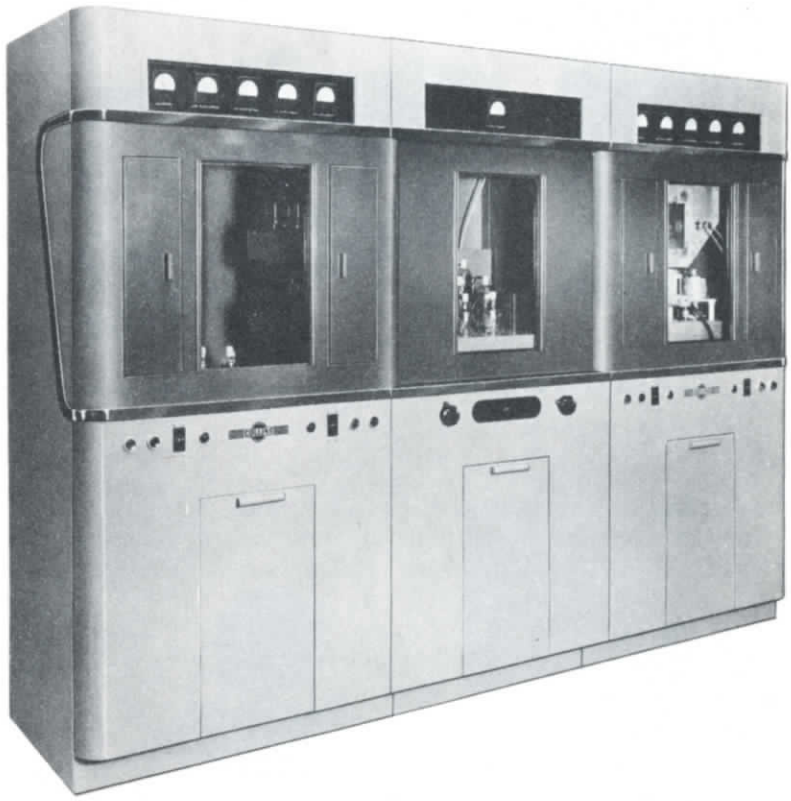
POWER SOURCE: 208/230 v single phase 50/60 cps

POWER DEMAND: 0% modulation 2300 w, 30% modulation 2370 w, 100% modulation 2840 w (83% power factor)

WEIGHT: Approximately 1,050 lbs

DIMENSIONS: 38" wide, 76" high, 27" deep

TRANSMITTERS



20V-1 KW

As are the 300J and 550A, the 20V is contained in a single rugged cabinet, occupying up to 75% less space than ordinary 1kw transmitters. All controls are on front, components are oversized and tubes are blower-cooled and visible at a glance.

FREQUENCY RANGE: 540-1600 kc standard — frequencies to 18 mc available

POWER OUTPUT: 1000/500 w (capable 1100/550 watts)

FREQUENCY STABILITY: Less than ±5 cps, (average less than ±2 cps)

AUDIO FREQUENCY RESPONSE: Within ±1.0 db from 30 to 15,000 cps (typical ±0.5 db from 30 to 15,000 cps)

AUDIO FREQUENCY DISTORTION: Less than 3% from 50-7500 cps for 95% modulation, including all harmonics up to 16 kc (typical — less than 2½% from 50-7500 cps, less than 2% from 100 to 5,000 cps)

RESIDUAL NOISE LEVEL: 60 db below 100% modulation

CARRIER SHIFT: Less than 3%, 0-100% modulation (typical—less than 2%)

RF OUTPUT IMPEDANCE: 75/50 ohms standard — other impedances available

AUDIO INPUT IMPEDANCE: 600/150 ohms

AUDIO INPUT LEVEL: +10 dbm ±2 db, pad input

AMBIENT TEMPERATURE RANGE: Up to +45°C

ALTITUDE RANGE: Sea level to 6,000 ft

POWER SOURCE: 208/230 v single phase 50/60 cps

POWER DEMAND: 0% modulation 2950 w, 30% modulation 3250 w, 100% modulation 4150 w (83% power factor)

WEIGHT: Approximately 1150 lbs

DIMENSIONS: 38" wide, 76" high, 27" deep

21E/M — 5/10 KW

Feature for feature, the most economical transmitter available — no crystal ovens, no external equipment, easy access to all relays, forced air cooling, visible tubes, compact size. The 21E/M also features simplified circuitry with only nine tube types in the 21E and ten in the 21M. Spurious radiation is held to a minimum.

FREQUENCY RANGE: 540-1600 kc standard, frequencies to 18 mc available

POWER OUTPUT: 21E — 5500/1100 w (5500/550 w on request); 21M — 10,600/5500 w

FREQUENCY STABILITY: Less than ±5 cps (typical — less than ±2 cps)

AUDIO FREQUENCY RESPONSE: Within ±1½ db from 30 to 15,000 cps (typical — ±1 db from 30 to 15,000 cps)

DISTORTION: Less than 3%, from 50 to 7500 cps for 95% modulation, including all harmonics up to 16 kc (typical — less than 2½% from 50-7500, less than 2% from 100-5,000 cps)

RESIDUAL NOISE LEVEL: 55 db below 100% modulation from 0-30 kc; 60 db below 100% modulation from 150 cycles to 7500 cps

CARRIER SHIFT: Less than 3% (typical value less than 2%)

RF OUTPUT IMPEDANCE: 75/50 ohms standard — other impedances available

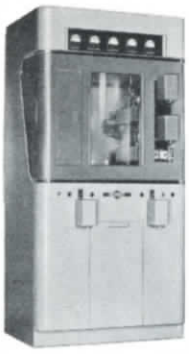
AUDIO INPUT IMPEDANCE: 600/150 ohms

AUDIO INPUT LEVEL: +10 dbm, ±2 db, 600 ohms input with built-in input pad. With the input pad removed, −5 dbm is sufficient for 100% modulation. 150 ohm connection of input transformer is possible when desired.

TEMPERATURE RANGE: Up to 45 degrees C

ALTITUDE RANGE: Sea level to 6,000 feet

POWER SOURCE: 208/230v, 3 phase 50/60 cps. 50 cps on special order



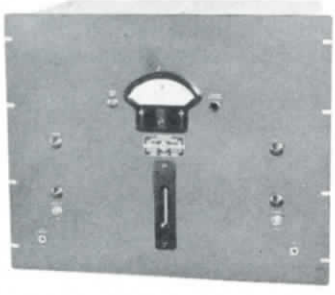
REMOTE CONTROL EQUIPMENT

The Collins-Rust Remote Control System derives the highest degree of reliability by the omission of vacuum tubes. The rack-mounted control unit at left accomplishes nine meter readings and ten functions. Also supplied is a rack mounting transmitter unit to work in conjunction with the actuators shown on the face of the 20V Transmitter.

TOWER LIGHTING CHOKES

These chokes provide thorough isolation of power lines from the RF field. They are in all-weather housings complete with mounting brackets, and conduit terminals are provided. The three Collins types are: 23C-1, 500-watt single phase; 23D-1, 1500-watt single phase, and 23E-1, 3,000-watt three phase. Each weighs 20 pounds.

TRANSMITTER ACCESSORIES



1181-A FREQUENCY DEVIATION MONITOR

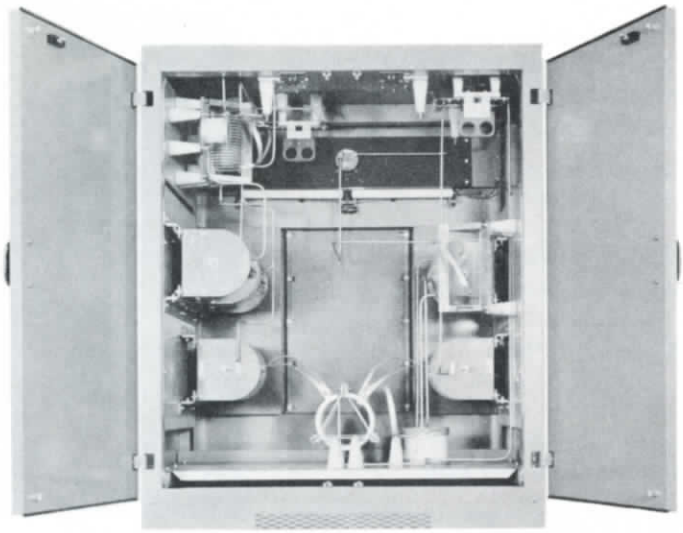
The 1181-A gives direct indication of magnitude and direction of the frequency deviation of an AM transmitter. The monitor input is obtained from the transmitter output. Positive indication of either transmitter carrier or monitor crystal oscillator is provided.

FREQUENCY RANGE: .5 to 2.0 mc
CRYSTAL: Supplied with unit. Specify frequency on purchase order
DEVIATION RANGE: ±30 cps
DIMENSIONS: 19" wide, 15¾" high, 13" deep, for rack mounting
POWER SOURCE: 105-125 or 210-250 vac, 50/60 cps 125 w

1931-A AM MODULATION MONITOR

Operating in the frequency range of 0.5 to 8 mc, the 1931-A measures percentage modulation on either positive or negative peaks, indicates overmodulation, monitors program level, measures carrier shift when modulation is applied and measures transmitter audio frequency response.

DIMENSIONS: 19" wide, 8¾" high, 10" deep, for rack mounting
POWER SOURCE: 105-125 vac, 40/60 cps, 50 w

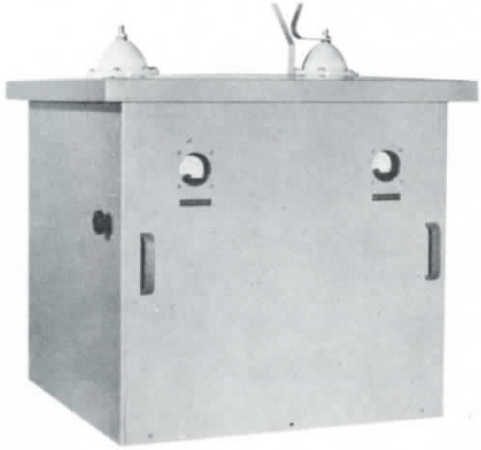


Directional antenna equipment (left) and Collins 20V transmitter

PHASING EQUIPMENT

Each Collins Directional Antenna installation is custom designed and built to satisfy the coverage requirements of the individual broadcaster and the specifications provided by his consulting engineer.

Designed to match the attractive appearance of the Collins line of transmitters, the phasor may also be obtained in a cabinet to match other makes of equipment. Controls for amplitude and phase are recessed front panel counter dials which have accurate reset characteristics for ease of tune-up. Other top features are unsurpassed stability and ease of maintenance. Antenna tuning units, specially housed in weatherproof cabinets if desired, are an integral part of Collins complete phasing equipment package.



42E/142A housing complete (above) and with front cover removed

ANTENNA TUNING UNITS

42E ANTENNA TUNER

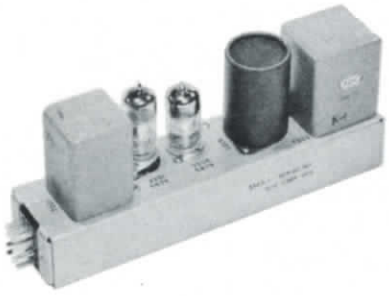
These are specially constructed units that match a vertical radiator to an unbalanced transmission line. The arrangement of the electrical circuit depends upon the particular application. Line current and antenna current meters are provided as well as a current transformer for a remote meter. Lightning protection is furnished by a horn gap.

Overall dimensions: 27″ wide, 27¾″ high, 27″ deep. Weight: 117 lbs. Finish: gray. Weatherproof housing.

142A SHUNT MATCHING NETWORK

This unit cancels reactance for matching shunt fed antennas to a transmission line. It is housed the same as the 42E above except only one meter and one tuning inductor are supplied. The 142A includes static drain choke and RF transformer for remote antenna current meter.

SUBUNITS FOR 212E/F OR RACK MOUNTING



356A-1 PREAMPLIFIER

The 356A-1 high fidelity two-stage unit operates from low-level mike or similar source, has sufficient output to drive program amplifier or audition facilities.

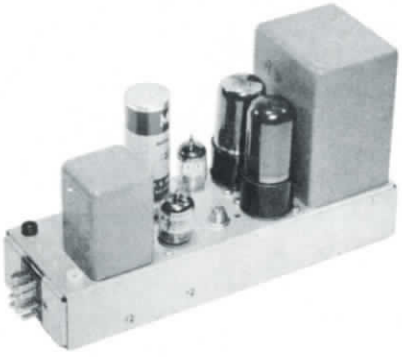
INPUT IMPEDANCE: Unloaded transformer. Source impedance 30/150/250/600 ohms (supplied wired for 150)

GAIN: 40 db

FREQUENCY RESPONSE: ±1 db, 50 to 15,000 cps

POWER REQUIREMENTS: 6.3 vac or dc at 0.3 amps. 250 vdc at 6.5 ma, or 300 vdc at 7.5 ma

DIMENSIONS: 4⅝" high, 2⅛" wide, 9½" deep



356B-1 PROGRAM/MONITOR AMPLIFIER

This plug-in subunit has three-stage amplifier with push-pull output and switch for high or low gain.

INPUT IMPEDANCE: Unload transformer, source impedance 150/600 ohms

OUTPUT LEVEL: +30 dbm to 8 watts (+39 dbm)

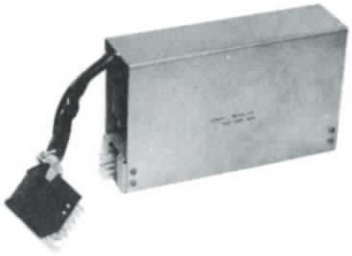
GAIN: 50 db or 68 db, selectable by switch

FREQUENCY RESPONSE: ±1 db, 50 to 15,000 cps

POWER REQUIREMENTS: 6.3 vac at 1.2 amperes
63 ma at 250 vdc at 1 w output
75 ma at 300 vdc at 1 w output
88 ma at 300 vdc at 8 w output

DIMENSIONS: 9½" long, 2⅞" wide, 5¾" high

AUDIO CONSOLES



274K-1 RELAY UNIT

The 274K-1 is a plug-in module with four relays to control studio speakers and warning lights.

CONNECTORS: Howard Jones P-312-AB connector mounted on front surface and P-315-CCE on 5½" pendant cable

DIMENSIONS: 5½" high, 2½" wide, 9" deep

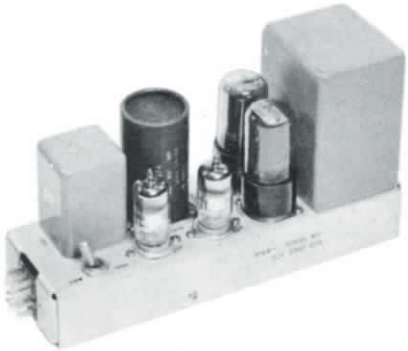
409X-1 POWER SUPPLY

This supply is used with the above units.

OUTPUT VOLTAGES: Up to 250 ma at 300 vdc, adjustable 6.0 amp at 6.3 vac, 12 vdc

POWER SOURCE: 115/230 vac, ±10%, 50/60 cps single phase

DIMENSIONS: 9½" long, 7½" wide, 6" high



356E-1 LIMITER AMPLIFIER

Acts as automatic average level or peak limiting amplifier in broadcast, TV and microwave audio. Permitting unattended operation of 212F and 212E, it also will control level differences between two or more sources as a program line compressor, expander-compressor or program amplifier.

RESPONSE: ±1 db 50 to 15,000 cps

COMPRESSION RATIO: Adjustable 1.6/1 to 5/1, 3/1 optimum, over a 30 db range at input

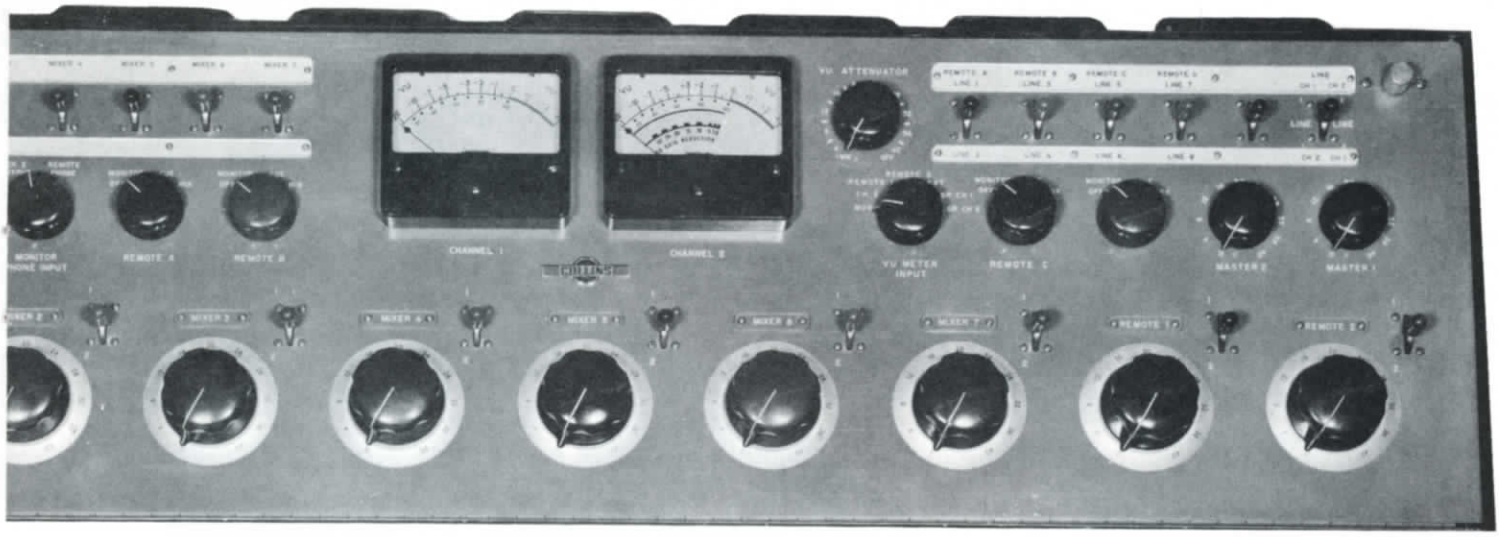
ATTACK TIME: 11 milliseconds with switch set for dual operation. 62 milliseconds with switch set for average operation

RELEASE TIME: 0.9 seconds for 63% recovery with switch set for dual operation

GAIN: 54 db

POWER SOURCE: 6.3 vac at 1.55 amp. +300 vdc at 7.7 milliamp

SIZE: 5⅝" high, 3" wide, 9" deep, plus connector



212E SPEECH INPUT CONSOLE

The 212E is a dual channel console for high fidelity AM, FM and TV broadcast service or program control in audio systems. It provides simultaneous mixing of up to 9 of 22 possible inputs, including mikes, remote line inputs, high level tape inputs and network line inputs. Also provided is monitoring of program lines, remote lines, and control of speakers, warning lights and associated equipments.

RESPONSE: ± 1.5 db 50 to 15,000 cps at program line

INPUT IMPEDANCE: Low level, 30/150/250/600 ohms (balanced or unbalanced). Remote lines: 150/600 ohms. (Shipped 600 ohms output and remote line impedance and 150 ohms low level input impedance)

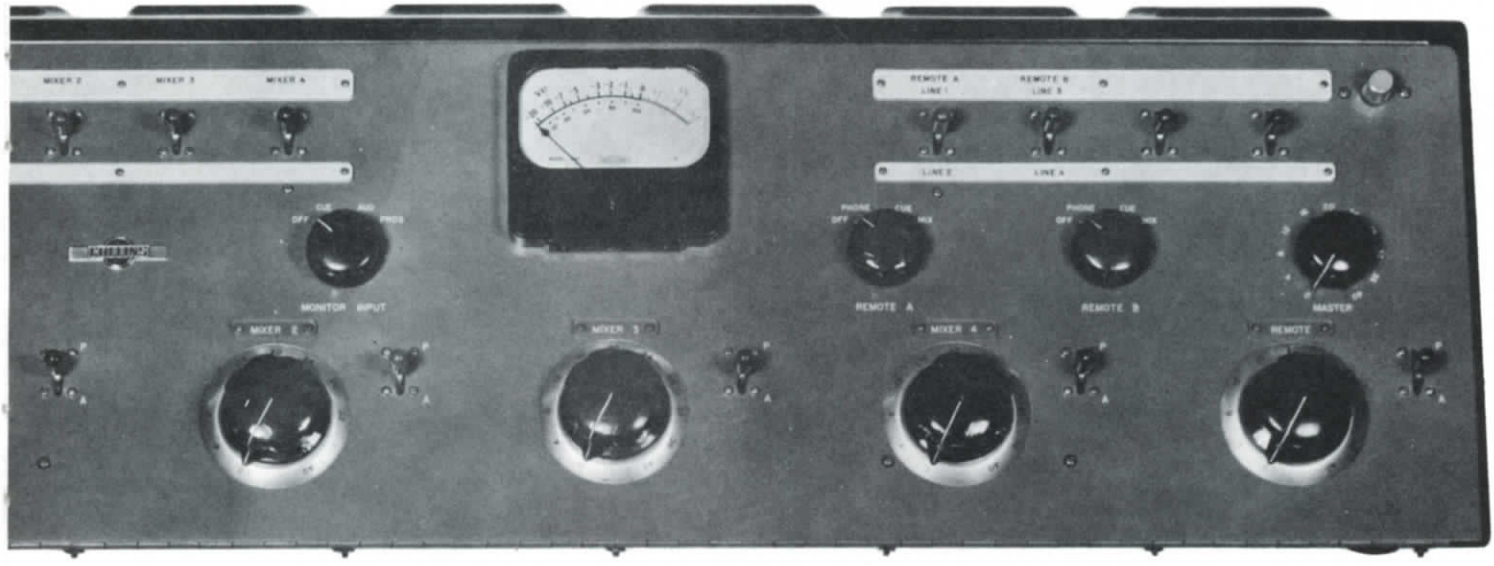
OUTPUT IMPEDANCE: Low level, 150/600 ohms. Monitor, 600 ohms

DISTORTION: Less than 1% at +18 dbm at program line. Less than 3% at 8 w out of monitor amplifier

GAIN: Low level to program line at least 100 db. Remote 54 db

POWER: 115 or 230 vac ±10%, 50/60 cps single phase

DIMENSIONS: 22½" d, 41⅛" w, 11" h



212F-1 SPEECH INPUT CONSOLE

This new console is an attractively styled, packaged unit with complete control over simultaneous broadcasting and auditioning from any combination of three of eight possible inputs. Adding two pre-amplifiers provides for mixing five of 12 possible inputs. Also provided for are monitoring of remote lines, control of speakers and warning lights.

RESPONSE: Audio ±1.5 db 50 to 15,000 cps

INPUT IMPEDANCE: Low level, 30/150/250/600 ohms (balanced or unbalanced)

OUTPUT IMPEDANCE: Program line, 150/600 ohms. Monitor, 150/600 ohms (shipped 600 ohms)

DISTORTION: Less than 1% at +18 dbm at program line. Less than 3% at 8 w out of monitor amplifier

GAIN: Low level to program line at least 100 db. Remote 50 db

POWER: 115 or 230 vac ±10%, 50/60 cps single phase

DIMENSIONS: 22" d, 35" w, 10¼" h

212Z FOUR-CHANNEL

Through the use of transistors, the 212Z is the lightest, most convenient four-channel remote available — only 22 pounds in carrying case with batteries. Features include power source of 115 volts ac or batteries, with automatic changeover on failure and restoration of ac power; maximum gain of 90 db; tone oscillator for line level setup; auxiliary output for PA feed. Four mikes may be accommodated. Distinctive finish of black and metallic blue-gray gives attractive abrasion-resistant finish.

INPUT IMPEDANCE: 25 to 600 ohms

GAIN: 90 db minimum

NOISE LEVEL: 55 db below normal output level (−115 dbm equivalent input noise figure)

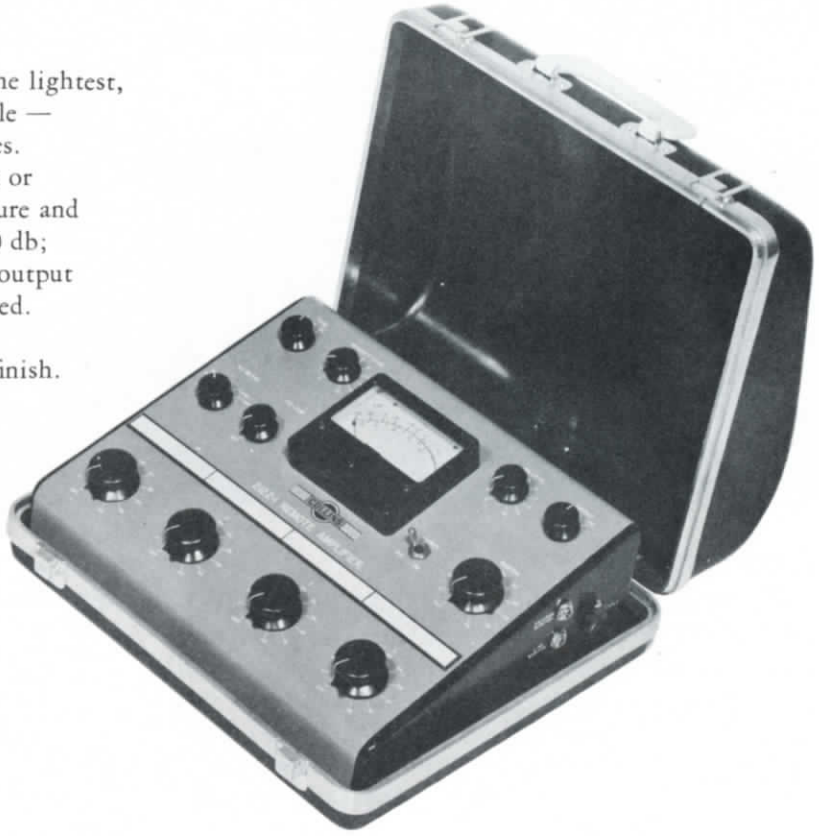
DISTORTION: Less than 1.5% at +5 dbm

FREQUENCY RESPONSE: ±1.5 db 50-15,000 cps

OUTPUT IMPEDANCE: 600 ohms (150 ohms available)

WEIGHT: 22 lbs complete with batteries in case

POWER OUTPUT: Normal +1 vu (11 dbm)
Emergency + 6vu (+16 dbm)



REMOTE AMPLIFIERS

212Y SINGLE CHANNEL

Incorporates one high fidelity channel, which operates from a low level velocity, dynamic or other self-generating mike. Available in two models: 212Y-1 (Cannon XL-3-13 mike connector) and 212Y-2 (P3-13 connector). Supplied with leather reinforced canvas carrying case.

IMPUT IMPEDANCE: 30/50 ohms or 200/250 ohms

GAIN: 85 db maximum

NOISE LEVEL: 65 db below normal program level

DISTORTION: Less than 1.0% 30-15,000 cps

FREQUENCY RESPONSE: Within 1 db 30-15,000 cps

OUTPUT IMPEDANCE: 600 ohms

POWER SOURCE: 115 v ac, 50/60 cps (self-contained)

WEIGHT: 10 lbs

212U TWO-CHANNEL

The 212U consists of the 212Y and a 60H mixer. Both are mounted in a single aluminum cabinet, and a convenient carrying case with handle and shoulder strap is provided. 60H may be purchased separately.

INPUT IMPEDANCE: 30/50, 150 or 200/500 ohms

GAIN: 85 db less mixer insertion loss

NOISE LEVEL: Better than 65 db below program level

DISTORTION: Less than 1½% 50-15,000 cps

FREQUENCY RESPONSE: ±2 db 30-15,000 cps

OUTPUT IMPEDANCE: 600 ohms

POWER SOURCE: 115 vac 60 cps (self-contained)

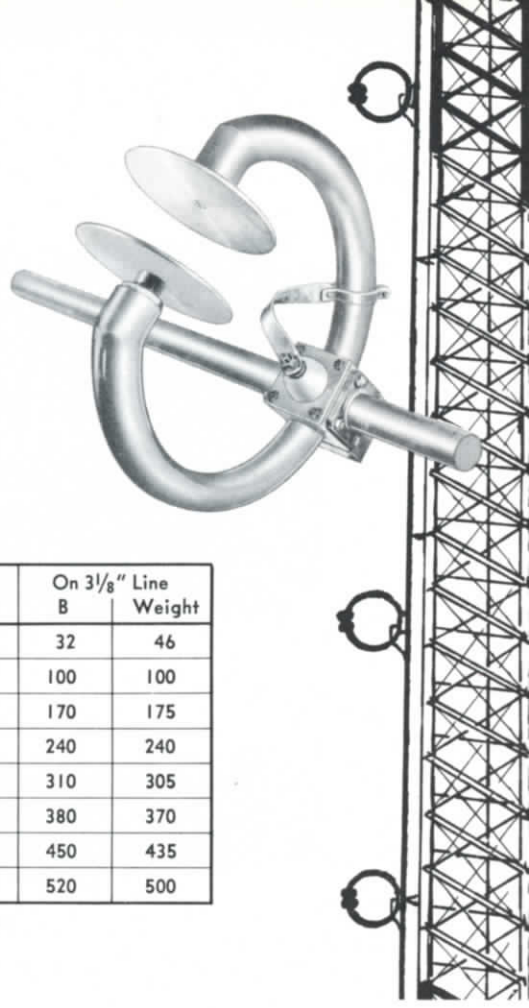
WEIGHT: 13 lbs

412C BATTERY BOX

Necessary for battery operation of 212Y and 212U, the 412C is sturdily constructed, holds batteries securely and weighs approximately 22 pounds with batteries.

FM RING ANTENNA

The Collins 37M Series FM Ring Antennas consist of two basic parts — radiating rings and connecting inter-ring transmission line. Any number of rings, either odd or even, may be employed, providing maximum flexibility in available power gains for the requirements of the particular installation. The 37M terminates in a standard RETMA 51.5 ohm flange connection on the bottom element of the array for coupling directly to the transmission line.



SIDE MOUNTING*

Collins Type	No. of Rings	Power Gain	Field Gain	A Feet	On 1⅝" Line B	On 1⅝" Line Weight	On 3⅛" Line B	On 3⅛" Line Weight
37M-1	1	.9	.95	2-6±	24	23	32	46
37M-2	2	2.0	1.41	12-6±	68	55	100	100
37M-3	3	3.0	1.73	22-6±	114	86	170	175
37M-4	4	4.1	2.02	32-6±	160	119	240	240
37M-5	5	5.2	2.28	42-6±	206	152	310	305
37M-6	6	6.3	2.51	52-6±	252	185	380	370
37M-7	7	7.3	2.70	62-6±	298	218	450	435
37M-8*	8	8.4	2.90	72-6±	344	251	520	500

* Top mounting antennas or antenna with more than eight rings quoted upon request.
A = overall length
B = windloading

PROGRAM EQUALIZERS

116F-1

This equalizer provides complete facilities for controlling the frequency response of program and communication circuits. Since its insertion loss is 40 db, the 6R Isolation Amplifier (overleaf) will return the gain to normal, plus gain if desired.

INPUT AND OUTPUT IMPEDANCE: 600 ohms, unbalanced
EQUALIZATION FREQUENCIES: 30, 50, 100 or 200 cps; 5, 7, 10 or 15 kc
FREQUENCY RANGE: 30-15,000 cps
DIMENSIONS: 19" wide, 5½" high, 7½" deep

116E-4

This unit is especially suited for stations having a variety of remote programs coming from different lines. The 116E-4 offers equalization in the high frequency ranges only for two lines simultaneously.

INPUT AND OUTPUT IMPEDANCE: 600 ohms unbalanced
EQUALIZATION FREQUENCIES: 5, 7, 10 and 15 kc
MAXIMUM BOOST: Approx. 30 db each channel
INSERTION LOSS: Approx. equal to amount of equalization used
FREQUENCY RANGE: 30 to 15,000 cps
DIMENSIONS: 19" wide, 3½" high, 8¼" deep

RACK MOUNTED AMPLIFIERS

26W-1 LIMITING AMPLIFIER

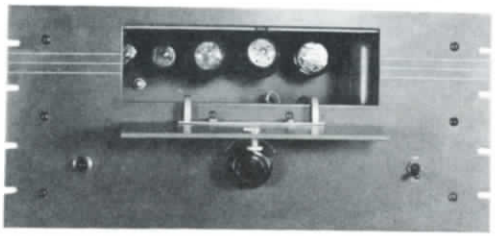
Prevents overmodulation and accompanying distortion, permits a higher average modulation level.

FREQUENCY RESPONSE: 50-15,000 cps ±1.0 db
INPUT IMPEDANCE: 200, 600 ohms, or bridging
INPUT LEVEL: −25 to +25 dbm
OUTPUT IMPEDANCE: 600 ohms
OUTPUT LEVEL: −12 to +18 dbm
COMPRESSION RATIO: 18/1 in db above verge of compression
OPERATE TIME: Adjustable 1.0, 3.0, or 10.0 milliseconds
RELEASE TIME: 1.0, 2.5 or 5.0 seconds
POWER SOURCE: 115 vac, 50/60 cps
DIMENSIONS: 14" high, 19" wide, 9" deep, for rack-mounting

6R-2 ISOLATION AMPLIFIER

Employs a gain control with 20 steps of 2 db each.

FREQUENCY RESPONSE: 30-15,000 cps ±1.0 db
DISTORTION: 1% max. at any level up to ±20 dbm
NOISE: −65 db
OVERALL GAIN: +45 db as line amplifier, +35 db as bridging amplifier
OUTPUT LEVEL: −20 to +20 dbm
MAXIMUM INPUT LEVEL: −10 dbm
INPUT IMPEDANCE: 600 ohms, or bridge with 20,000 ohms → 150 ohms available
OUTPUT IMPEDANCE: 600 ohms — 150 ohms available
POWER REQUIREMENTS: 6.3 v, 0.6 amp; 100 to 250 vdc at 20 ma
DIMENSIONS: 19" wide, 3½" high, 8⅛" deep

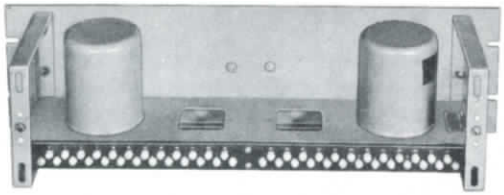


6X-2 MONITOR AMPLIFIER

High fidelity 10 w monitor amplifier with power supply.

INPUT IMPEDANCE: 600 ohms matching, 20,000 ohms bridging (150 ohms available)
OUTPUT IMPEDANCE: 600 ohms, balanced
OUTPUT LEVEL: +40 dbm (10 w, 12 w max.)
OVERALL GAIN: 55 db maximum
FREQUENCY RESPONSE: 30 to 15,000 cps ±1.5 db
POWER SOURCE: 115 vac 50/60 cps
MOUNTING DIMENSIONS: 8¾" high, 19" wide, 10¼" deep

ACCESSORY PANELS



117N-2 REPEAT COIL PANEL

Includes chassis, terminal board, dust cover, not repeat coils. The 117N-2 will accommodate four Thordarson type repeat coils with an R-4 case. Fifty terminals on the board make connections to external equipment. Dimensions: 5¼" high, 19" wide, 5" deep.

112B-1 SWITCH AND FUSE PANEL

The 112B-1 provides primary ac control over ten different circuits. A heavy-duty circuit breaker, operated by a snap action switch, carries the total ac load, and each of the ten circuits is individually fused. A door in the front panel furnishes convenient access to the fuse. The panel is 5¼" high, and mounts in a standard 19" rack. Complete with set of extra circuit-breaker heaters for operation at 3, 5 or 7 amperes. Furnished with 9 amp link installed.

WARNING LIGHT ASSEMBLIES

209A-1 FLUSH TYPE

209A-2 EXTERNAL TYPE

The 209A assemblies are constructed of aluminum sheet metal with a divided compartment. Each of the two light compartments contains two 7½ watt 110 volt ac bulbs and sockets to provide illumination of the lettering.

The signs are made of boilable lucite with a black surface except for lettering. The four available signs are:

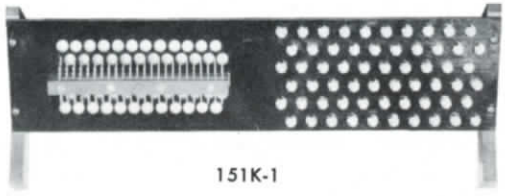
ON THE AIR	Red letters	STAND BY	Green letters
ON THE AIR	Red letters	AUDITION	Green letters
ON THE AIR	Red letters	REHEARSAL	Green letters
AM	Red letters	FM	Green letters

Special wording is available at additional cost.

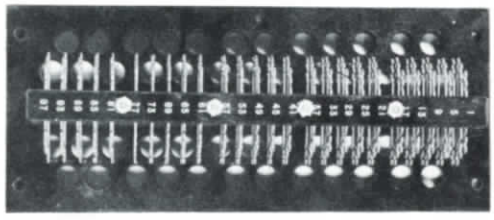
The 209A-1 flush type is mounted with the light box recessed in the wall and used as the junction box, or mounting it to a standard junction box recessed deeper into the wall. The cover plate mounts directly to the wall with four screws. Dimensions: 4⅝" high, 7⅜" wide, 2" deep.

The 209A-2 external type is mounted with the light box directly over a standard junction box which is recessed in the wall the usual depth. The cover plate mounts directly to the light box with two screws. Dimensions: 4 5/16" high, 9½" wide, 2" deep.

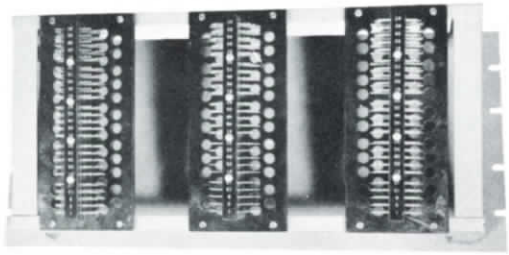
TERMINAL BOARDS



151K-1



151K-5



151K-3

151K-1

For the base of rack mounting cabinets, the K-1 contains 96 telephone type solder terminals for audio connections, and 60 heavy duty threaded stud type terminals for power connections.

151K-5

The K-5 consists of 100 telephone type terminals, 25 in a row, four rows deep, on a 3½" x 8" bakelite board which has 7½" x 2½" mounting centers.

151K-4

This has four 151K-5's assembled on an inclined plane on an 8¾" x 19" panel for standard rack mounting. The assembly is 7½" deep.

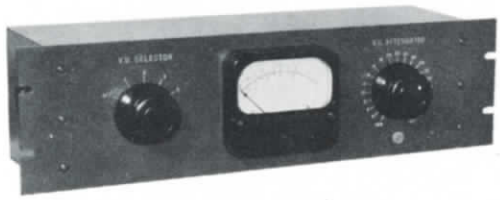
151K-3

The K-3 is identical to the K-4 except it has only three 151K-5's.

151K-6

This is similar to the 151K-1 except that 144 telephone type terminals are provided.

METERING UNITS



62E-2 VU PANEL

The 62E-2 accurately monitors audio levels in broadcasting, recording studios and sound systems. Weston 30 meter features illuminated face and easy reading. Overswing is slight, and pointer action is deliberate and positive. The 62E-2 operates from 600 ohm line, but other impedances may be used with a calibration chart.

INPUT IMPEDANCE: 7500 ohms constant except on the 1 mw calibration position

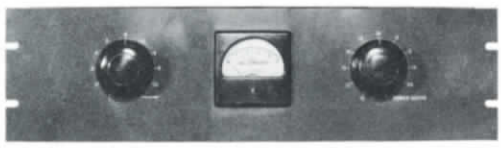
ATTENUATOR RANGE: +4 db to +40 db in 2 db steps, T-type construction

NUMBER OF INPUT CIRCUITS: Four

FREQUENCY RANGE: Constant response within 0.2 db up to 10,000 cps

POWER REQUIREMENTS FOR METER ILLUMINATION: 6.3 vac or dc, 0.3 amp

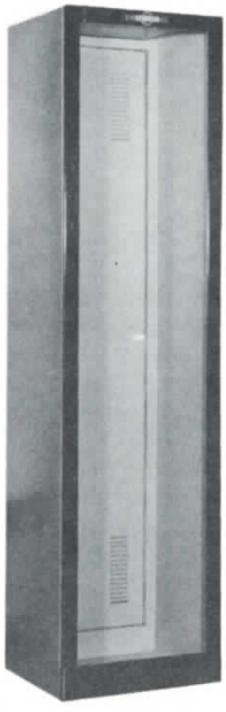
DIMENSIONS: 19" wide for standard rack mounting, 5¼" high

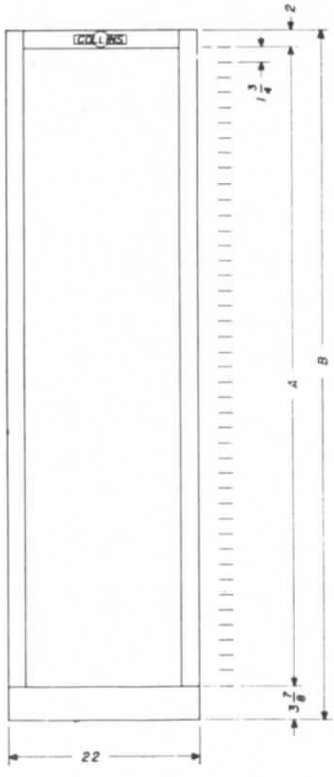


82T-1 METERING UNIT

Wired to accommodate 10 plate metering circuits and 10 cathode metering circuits, the 82T-1 will operate for 20 cathode circuit measurements by adding jumpers on the terminal strip.

The basic meter movement is 1 ma full scale, and is calibrated 0 to 5. It will indicate currents of 0-5, 0-50, and 0-500 ma with a 25 ohm, 2.04 ohm or 0.22 ohm multiplier resistor. In addition, a twenty-first position allows a check of the ac voltage in the rack. Dimensions: 12" wide, 5¼" high, 7½" deep.





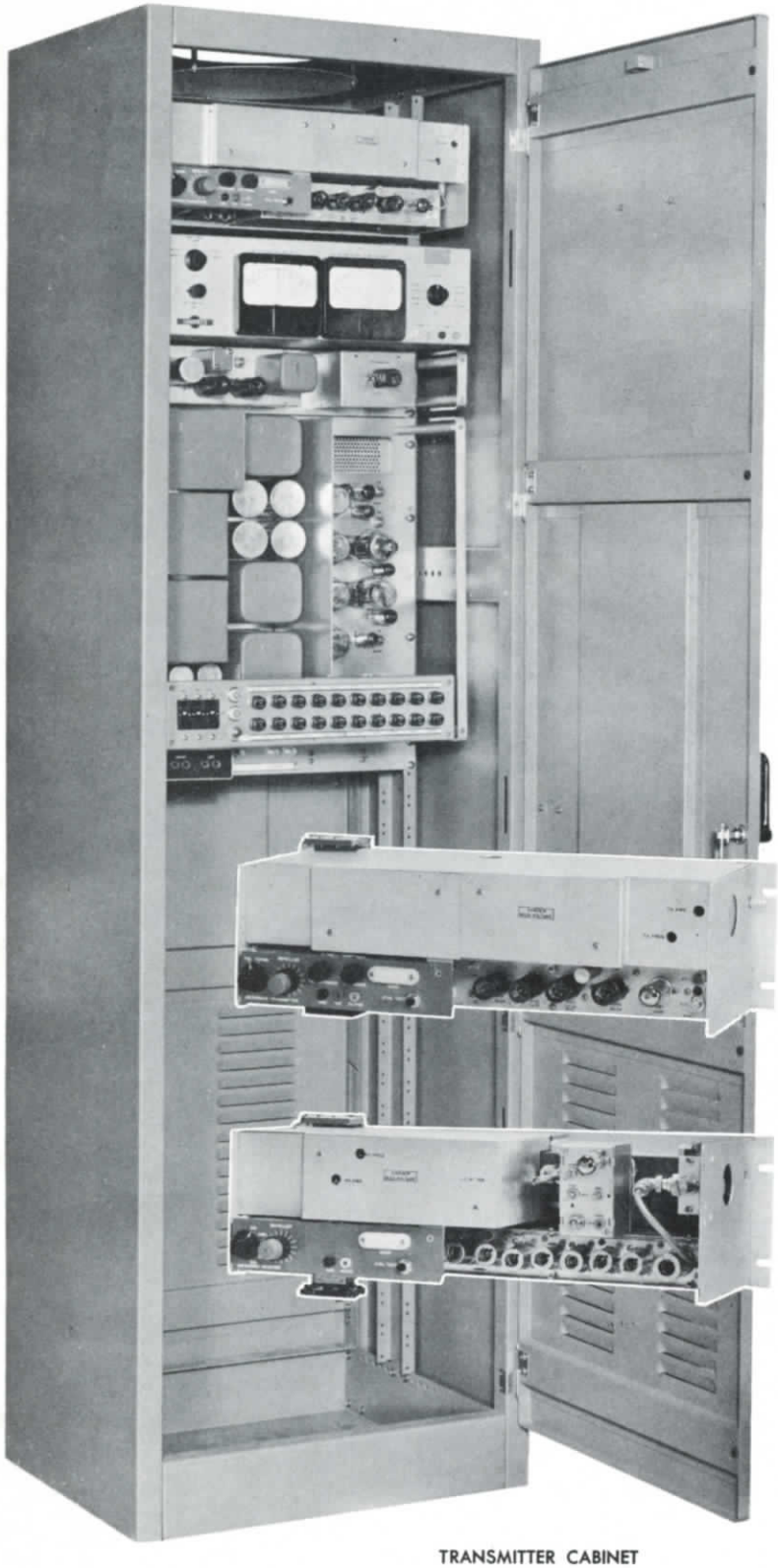
RACK CABINETS

Type 619B Cabinets are sturdily constructed of sheet metal, conveniently drilled to accommodate standard 19" panels of any height. A hinged full-length rear door provides immediate access to all units mounted in the cabinet. Adequate ventilation is obtained through louvers in the door and through an opening in the top that is protected from dust by a baffle plate. The outside depth of the cabinet is 18 inches.

These cabinets are available in metallic gray finish. Black lacquered style strips are furnished with each cabinet.

619B cabinets are furnished in two sizes, the 619B-1 having 77" panel mounting space, and the 619B-2 which has 70" panel mounting space. Overall heights are 83" and 76" respectively.

TV-STL MICROWAVE RELAY SYSTEM



TRANSMITTER CABINET

INSERT: 552A TRANSMITTER (TOP)
551A RECEIVER

Collins TV Studio-to-Transmitter Link System combines reliability with convenience for the operating engineer. The system, contained in a single cabinet or rack at both studio and transmitter sites, transmits NTSC color or monochrome and high fidelity audio in the 6875-7125 mc band. Easily accessible operating controls, test points throughout and plug-in subunits facilitate service and maintenance.

The system also allows for location of the parabolic antenna as much as 75 feet from the RF unit at each terminal, resulting in complete indoor installation. Both terminals are also fully metered. For maximum reliability, complete standby facilities are available, requiring no additional floor space.

Also available is a complete line of STL accessories, including high quality passive reflectors and parabolic antennas in a variety of sizes.

RF POWER OUTPUT: 150 milliwatts (−8.3 dbw) minimum

MODULATION TYPE: FM

RECEIVER IF BANDWIDTH: 14 mc to 3 db points, minimum

ANTENNA CHARACTERISTICS:

Parabola Dia. in Ft.	Gain in db at 6700 mc	Half-Power Beam-width (H Plane)
4	36.0	2.6°
6	39.5	1.7°
8	42.0	1.3°

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

OVERALL SYSTEM RESPONSE (VIDEO ONLY): ±1.0 db, 60 cps to 4.2 mc (3 db down at 7 mc when audio channel is not used)

AUDIO CHANNEL RESPONSE: ±1.0 db, 60 to 15,000 cps

AUDIO CHANNEL DISTORTION: Less than 1%

AUDIO CHANNEL SUBCARRIER FREQUENCY: 6.5 mc

AUDIO CHANNEL INPUT LEVEL: Minimum −10, maximum +10

AUDIO CHANNEL OUTPUT LEVEL: 0 db nominal, +10 db maximum

TRANSMITTER VIDEO INPUT LEVELS: 0.7 to 2.0 v peak to peak nominal

TRANSMITTER VIDEO INPUT IMPEDANCE: 75 ohms, unbalanced

RECEIVER VIDEO OUTPUT LEVEL: 1 to 1.5 v, peak to peak

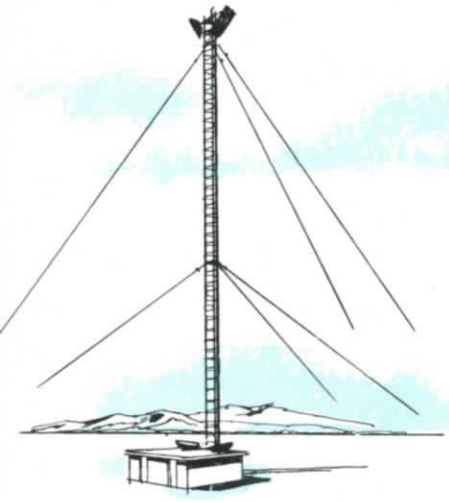
RECEIVER VIDEO OUTPUT IMPEDANCE: 75 ohms, unbalanced

VIDEO NOISE: −30 db or better

DIFFERENTIAL GAIN: ±1 db or less

DIFFERENTIAL PHASE: +3° or less

PRE-EMPHASIS: 12 db symmetrical about 400 kc



Collins MICROWAVE COMMUNICATION,

Collins microwave, incorporating Collins Mechanically-Filtered multiplex, is characterized by high channel capacity, efficient performance, and ease of maintenance. Building block construction permits simple expansion in the future as the system requirements change.

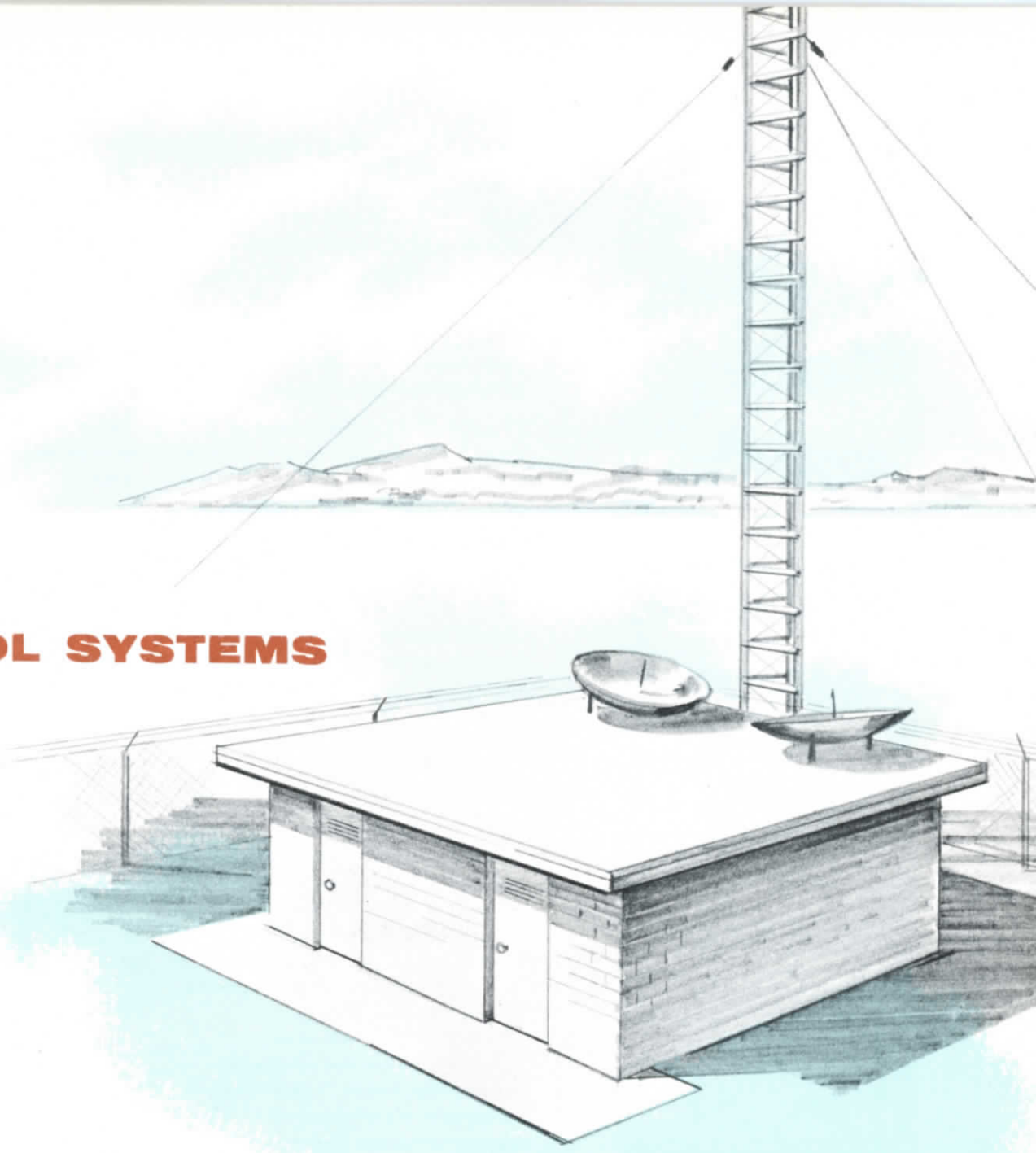
Collins stands ready to provide complete "turn-key" service — assuming all tasks of evaluation, siting, systems engineering, the most advanced equipment, installation, training and field service.

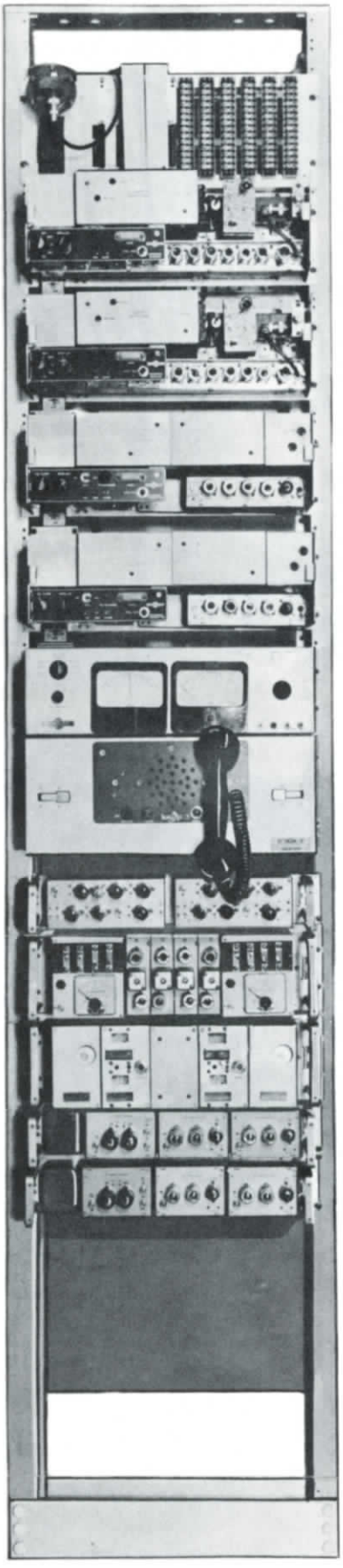
Five basic RF system configurations are offered for the following applications:

Systems without standby
Systems with 100% 'hot' standby
Systems with 100% 'cold' standby
Frequency diversity terminals and repeaters
Space diversity terminals and repeaters

Each of these systems is adaptable to either ac or float-charged battery operation and will satisfy all FCC requirements for unattended operation.

CONTROL SYSTEMS





RF rack equipped with 'hot' standby

RADIO FREQUENCY SYSTEM

Collins RF equipment, in the 5925-8500 mc* bands, provides full duplex circuitry and may be utilized with existing wire lines and other facilities to provide communication for telephone, teleprinter, telemetering, supervisory control and facsimile transmission.

This equipment provides a linear broad-band system for most reliable point-to-point transmission. The passband from 200 cps to 2 mc permits transmission of 240 voice channels of single sideband suppressed carrier type.

Features of the system include 7,000 mc band, stable 15 mc passband through use of fixed-tuned amplifiers, optional battery operation, articulated hinges, built-in test facilities, automatic switchover, diversity operation, long-life reflex klystrons.

The RF transmitter includes the reflex klystron, waveguide assembly, reference frequency cavity, capacitive decoupler, modulator, temperature stabilized oven, tuning and operating controls and filament source.

The RF receiver contains the waveguide assembly, local oscillator reflex klystron, mixer crystal, IF amplifier, AFC, temperature stabilized oven, tuning and operating controls and filament source.

*6875 — 7125 is TV-STL, see page 49.

Frequency Range	Transmitter Type Number	Receiver Type Number
5925 — 6425 mc	552A-1A	551A-1
6575 — 6875 mc	552A-3	551A-3
7125 — 8500 mc	552A-5	551A-5

FREQUENCY STABILITY: 552A-1A, ±.02%; others ±.05%

TRANSMITTER: Reflex klystron

TRANSMITTER POWER: 100 mw

LOCAL OSCILLATORS: Reflex klystron

POWER SOURCE: 177 v, 60 cps ac, single phase

TYPE OF SERVICE: Continuous duty, unattended

TYPE OF MODULATION: FM

INTERMEDIATE FREQUENCY: 60 mc

IF BANDWIDTH: 15 mc (half power points)

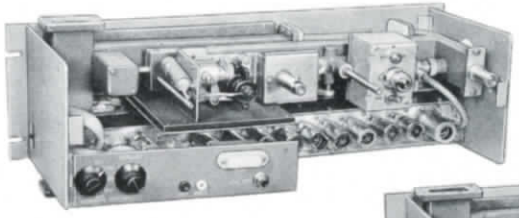
RECEIVER NOISE FIGURE: 14 db, including preselector filter

MODULATION DEVIATION: Nominal ±3.0 mc

DIVERSITY OPERATION: Frequency and/or space

RF DUPLEXING: Continuous and simultaneous 2-way communication through common antennas by employing waveguide filters and tuned stubs

STANDBY PROVISIONS: Complete standby with automatic switchover when desired
Unit construction allows maximum installation flexibility

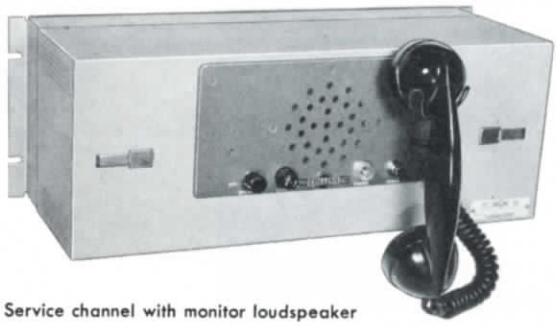


551A Receiver with covers removed

552A Transmitter with cover removed

SERVICE CHANNEL

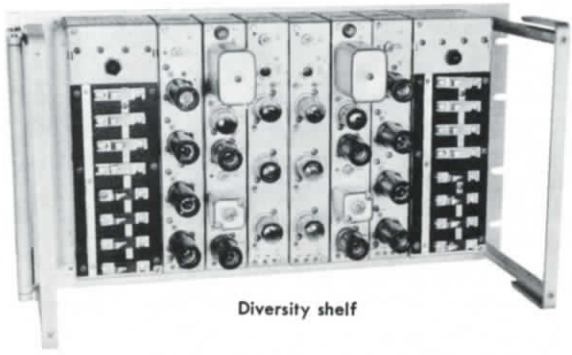
The Service Channel provides simultaneous transmission and reception with signalling on a party-line basis between all stations in a system. These units employ direct modulation of the microwave system and are completely independent of the carrier equipment. The audio input and output information can be connected to Collins universal termination units for extension over two- or four-wire telephone facilities.



Service channel with monitor loudspeaker

AUTOMATIC FREQUENCY CONTROL

The Transmitter AFC provides smooth, positive correction and alarm of any off-frequency condition in the system. The alarm can also be remoted via the system's fault alarm (below) to supervisory stations. The AFC utilizes an all-electronic servo loop. Unlike electro-mechanical servo systems, there is no tendency to 'hunt' caused by mechanical inertia, no gear trains, mechanically positioned potentiometer nor other mechanical devices. The functions are accomplished by frequency alarm reference amplifier and signal amplifier modules.



Diversity shelf

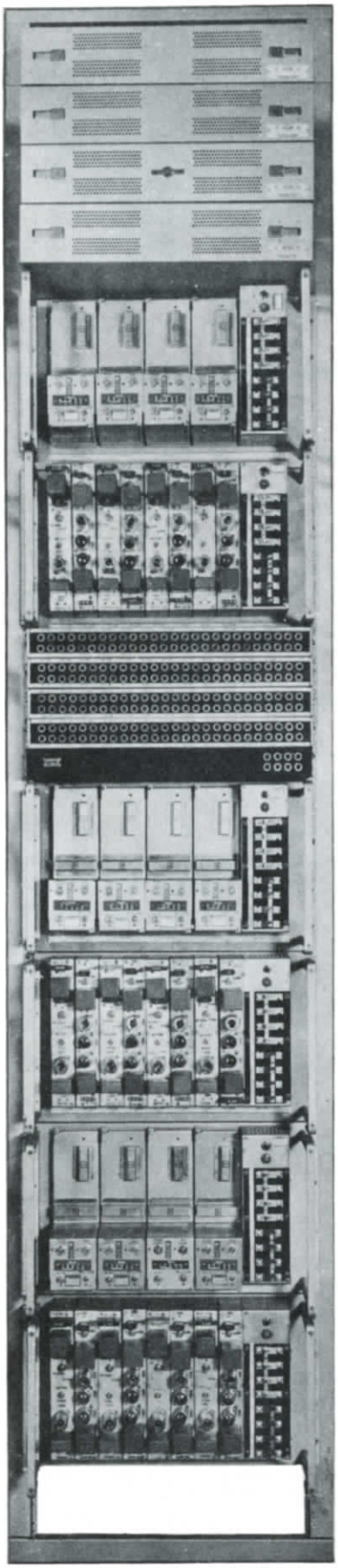
DIVERSITY SYSTEMS

Problems arising from atmospheric stratification and reflections in microwave transmission are most effectively solved by diversity reception. Frequency diversity employs two separate radiation patterns for any refractive medium; the relationship is such that when one signal is faded the other signal is usable. Space diversity solves reflective problems by using two antennas, one of which will receive an adequate signal. Collins has incorporated a unique combining action for utilization of the stronger signal in both systems.

FAULT ALARM

This system can monitor such information as RF switchover, transmitter off-frequency condition, unauthorized entrance to building, standby generator operation, tower light failure, blown fuses, multiplex equipment standby and excessive room temperatures. Eleven fault alarm functions may be supplied to a supervisory position from up to ten unattended remote stations. Information from additional multiples of ten remote stations in more extensive systems can be fed to either one or more supervisory positions. Signals may be visual and/or aural.

VOICE CARRIER MULTIPLEX SYSTEMS



12-Channel Multiplex Rack

Collins carrier equipment, available to meet all channel requirements up to 240 channels, converts audio information from individual inputs to a form suitable for transmission over a selected circuit. Carrier equipment is also used to reverse the process, terminating in separate voice channels. Each channel may contain telephone, teletypewriter, telemetering, supervisory control or facsimile information.

As an example, Collins 120-channel system consists of ten base groups of 12 channels each. Twelve different channel modulators and demodulators are employed, each having a specific carrier frequency. Only the upper sideband is used in the channel modulators. The injection frequencies for the channel modulators and demodulators are obtained from a system employing only one crystal oscillator. The 100 kc crystal oscillator feeds a spectrum generator which has output frequencies of 4 kc and 12 kc. The 4 kc pulse is applied to channel frequency generators which select a particular harmonic and produce channel frequencies spaced 4 kc apart in the 60-104 kc range.

Carrier equipment mounts on standard 19-inch racks, has articulated hinges. Plug-in modulator arrangement permits quick replacement of any unit.

TYPE OF MULTIPLEXING: Frequency division

TYPE OF MODULATION: Single sideband, suppressed carrier

FREQUENCY RANGE OF OUTPUT: 60-552 kc for 120 channels (Allocations conform to CCIF and US standards)

NUMBER OF CARRIER CHANNELS: From 1 to 240 full duplex channels

AUDIO FREQUENCY RESPONSE: ±2 db from 350 to 3450 cps when signaling not used. 350 to 2800 cps when signaling provided

RESIDUAL NOISE: Max. 23 dba at O dbm level on back-to-back basis

STANCBY PROVISIONS: Available for all carrier units common to more than one channel

SIGNALING PROVISIONS: Common to all individual channels

TWO- AND FOUR-WIRE INPUT AND OUTPUT: Impedance 600 ohm ±10%. Level: Nominal 0 dbm

FREQUENCY ERROR: System fully synchronous with 0 frequency error throughout

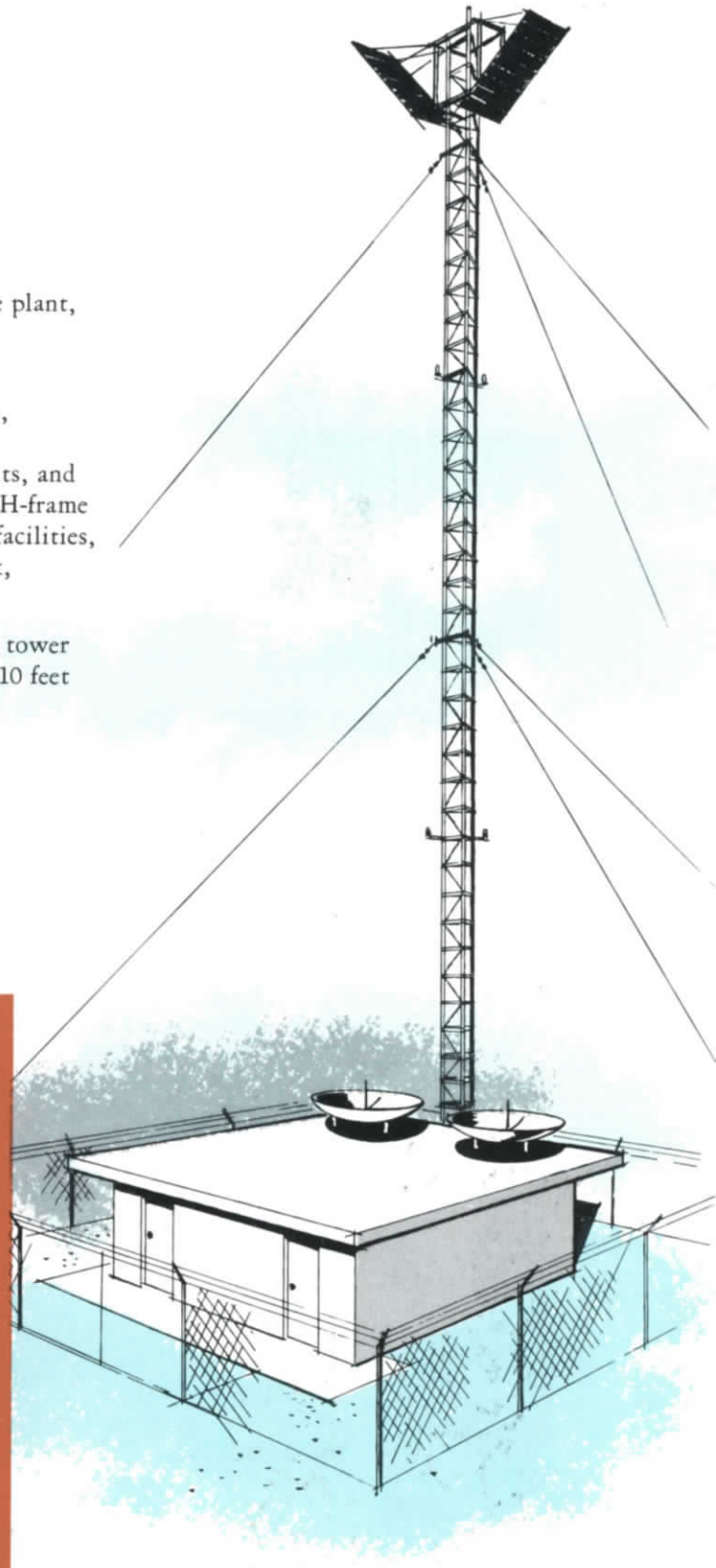
120-Channel Equipment

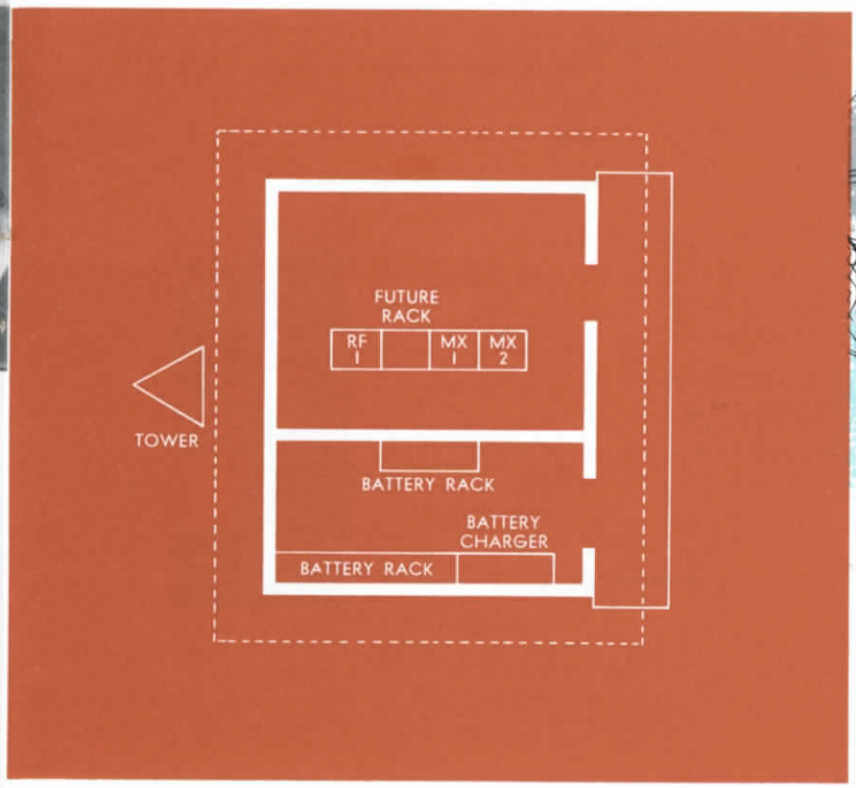
OUTSIDE PLANT

An integral part of Collins turn-key service is the outside plant, including antennas, reflectors, towers, shelters, fences, auxiliary generators, access roads, etc.

Each is individually specified for a particular installation, but in each case Collins either meets or exceeds RETMA specifications. Towers are matched to loading requirements, and all types are available, including self-supporting, guyed, H-frame and others. The same flexibility applies to other outside facilities, such as shelters, where such basic types as concrete block, poured concrete and all-steel can be utilized.

The antenna system includes the parabolic antenna and a tower mounted reflector. Basic sizes of antennas are 4, 6, 8 and 10 feet in diameter, and reflectors are available in 6 ft. x 8 ft., 8 ft. x 12 ft. and 10 ft. x 15 ft. sizes.



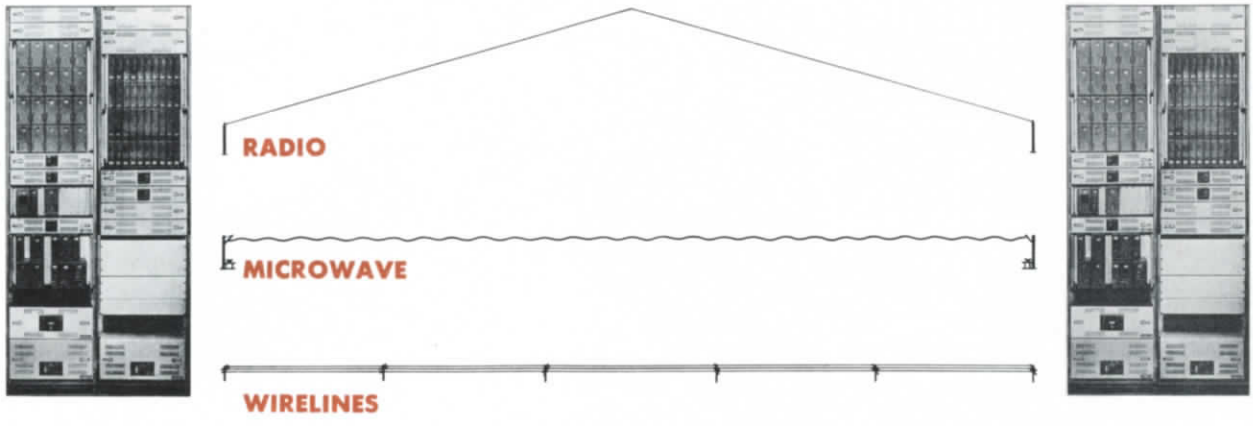


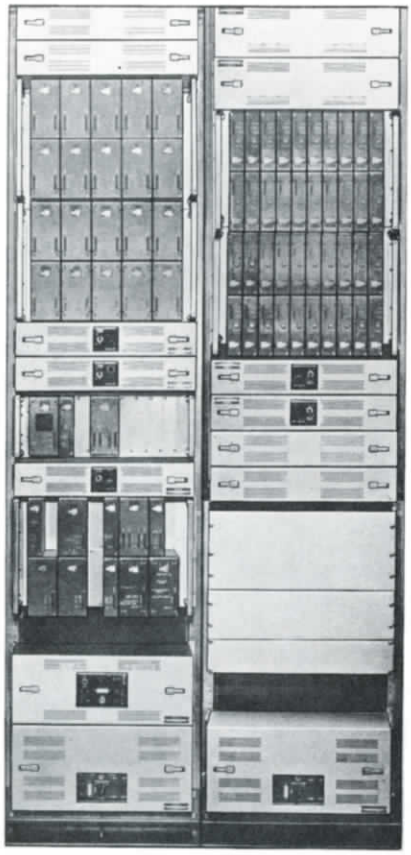
Collins Kineplex® Data System, an all-transistorized high capacity and flexible system for transmitting binary information over wire line, cable, microwave and other radio circuits, employs a new signalling technique which provides a much superior signal-to-noise performance and allows a more efficient utilization of the spectrum than standard frequency shift keyed pulse signalling systems. Kineplex®, which employs plug-in modular construction and utilizes printed wire circuitry, will transmit data up to 3,000 bits per second in a 3 kc bandwith when used with the Series-Parallel Converters, or when used with Teleprinter Converters it will provide 40 channels at 60, 75 or 100 words per minute operation on a 3 kc bandwith. The total data transmission capacity may be divided between different services as best satisfies a specific application. In a business

kineplex

A HIGH SPEED DATA TRANSMISSION SYSTEM

machine application, Kineplex® will take stored machine data in serial or parallel form and transmit it at the 3,000 bit rate. Information can be fed from magnetic tape, paper tape, punched cards or other storage media. The new Collins transmission system may be utilized to transmit information to and from a main plant data processing center and widespread branch plant centers. By connecting such centers, a firm could have control over production planning and services, disbursements, costs, tabulating, records, marketing, accounting, and many other areas.





FRONT VIEW

COLLINS TE-202 KINEPLEX® DATA SYSTEM WITH TELEPRINTER CONVERTERS

WEIGHT: 700 pounds

DIMENSIONS: 86⅛" high, 41" wide, 20" deep

SIGNALS:

TRANSMIT INPUT: Non-synchronous dc telegraph "start-stop"signals, —60 ma for a "mark," 0 for a "space."

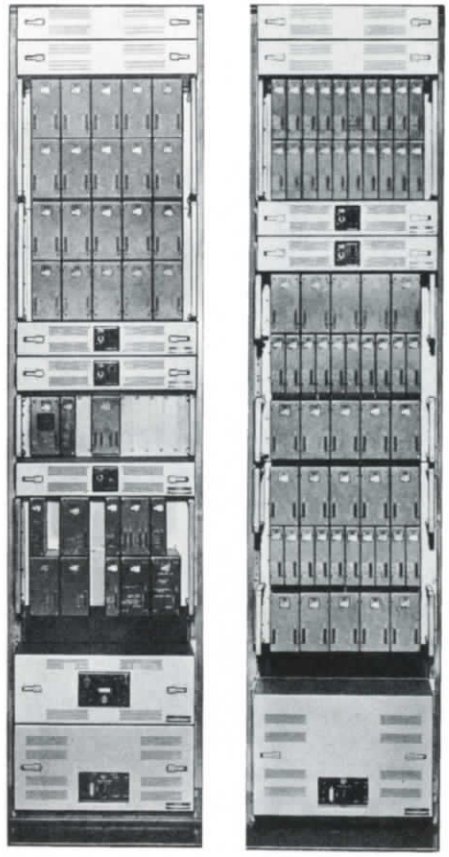
TRANSMIT OUTPUT: Composite signal of 21 audio tones with a range from 605 cps to 2915 cps and a level of +4 dbm.

RECEIVE INPUT: Composite signal of 21 audio tones with a range from 605 cps to 2915 cps and a level of —13 dbm.

RECEIVE OUTPUT: Non-synchronous dc telegraph "start-stop" signals, ungrounded, 120 v across 2,000 ohms for a "mark," 0 for a "space."

CHANNELS: 40 channels maximum, 60, 75 or 100 wpm each.

POWER INPUT: Synchronous Data Transmission Equipment: 9 amperes at —27.5 v dc or 700 watts at 115 v, 60 cycle single-phase.
Teleprinter converter equipment: 3 amperes at —27.5 v dc or 250 watts at 115 v, 60 cycle single-phase.
Total power input: 950 w 115 v 60 cycles, single-phase or 22 amperes at —27.5 v dc.



FRONT VIEW REAR VIEW

COLLINS TE-202 KINEPLEX® DATA SYSTEM

WEIGHT: 400 pounds

DIMENSIONS: 86⅛" high, 41" wide, 20" deep

SIGNALS:

TRANSMIT INPUT: 40 parallel synchronous data signals each operating at 75 bits per second, —23 v dc for a "mark," —13 v dc for a "space," balance ungrounded, 10,000 ohms input circuit.

TRANSMIT OUTPUT: Composite signal of 21 audio tones with a range from 605 cps to 2915 cps and a level of +4 dbm.

RECEIVE INPUT: Composite signal of 21 audio tones with a range from 605 cps to 2915 cps and a level of —13 dbm.

RECEIVE OUTPUT: 40 parallel synchronous data signals each operating at 75 bits per second, —23 v dc for a "mark," —13 dc for a "space," unbalanced grounded.

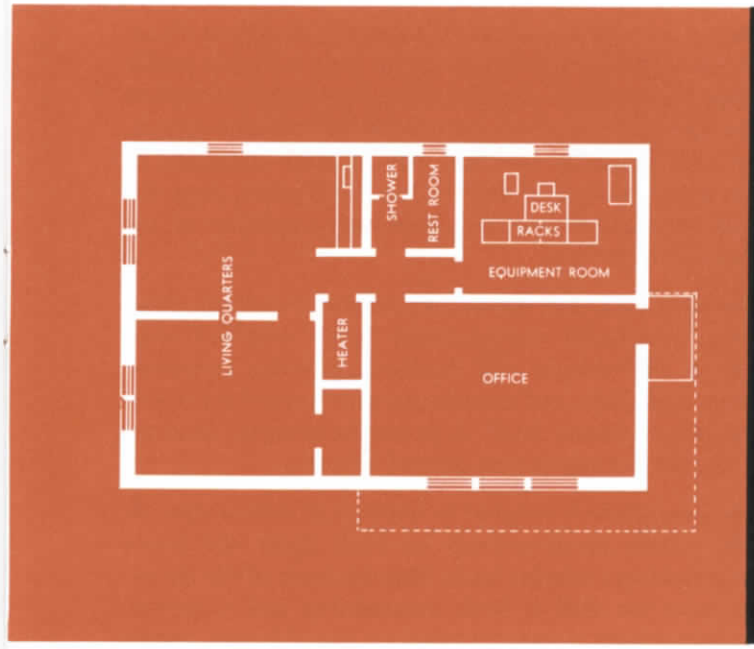
POWER INPUT: Synchronous data transmission equipment: 9 amperes at —27.5 v dc or 700 watts at 115 v, 60 cycle single-phase.

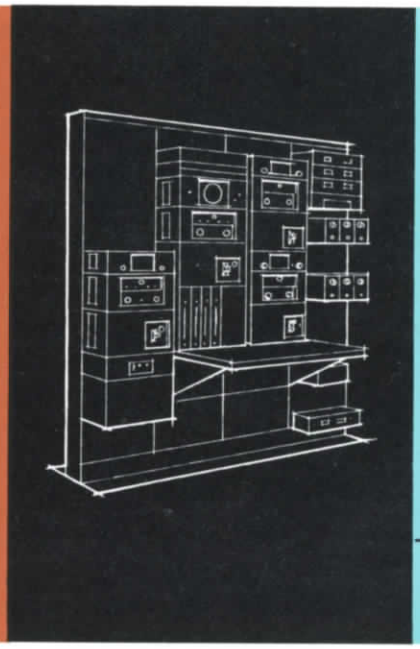
OPERATING CONDITIONS: Fixed station 0-45° C ambient, humidity to 95 percent.

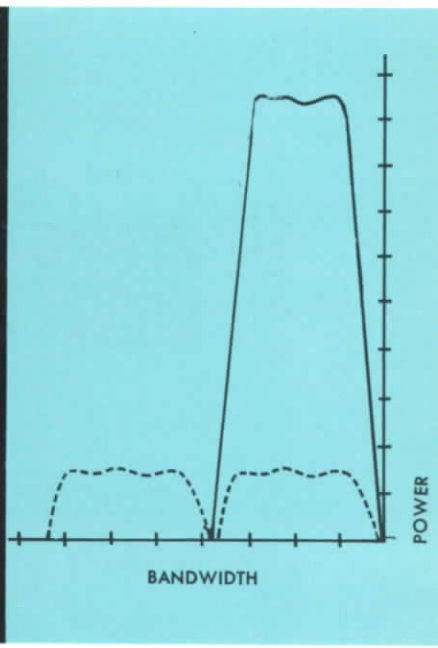

Collins SSB HF

COMMUNICATION SYSTEMS

Pioneering development by Collins for almost a decade has helped make single sideband practicable for general use in ground, airborne and marine service to relieve spectrum congestion and improve communication. The result is integrated system designs taking advantage of SSB's narrower bandwidth, greater effective talking power and relative immunity from degradation from selective fading. Some of the developments which have made these systems possible are distortion reduction techniques, extremely stable frequency sources, the Collins Mechanical Filter, improved low spurious circuitry, non-critical neutralization methods and precision servo tuning.







TYPICAL 500-WATT SSB STATION

205J-1 45-KILOWATT HF TRANSMITTER

The 205J-1 is a 45-kw PEP, 3-stage linear amplifier in the 2-30 mc frequency range, accommodating any signal within its power and bandwidth capabilities. Tuning is automatic, using servos plus prepositioning information. An input at operating frequency is provided by a 310F-type exciter. Distortion reduction from RF feedback and envelope modulation results in improved linear operation for superior SSB service.

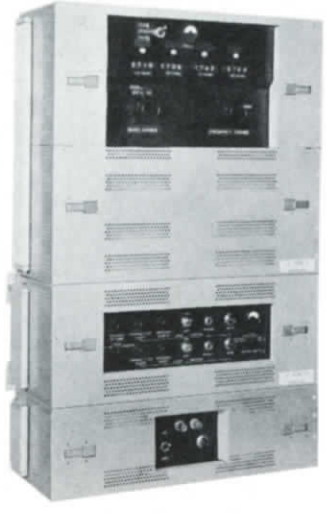
OUTPUT IMPEDANCE: 50 ohms, maximum SWR 2 to 1

SSB DISTORTION: 45 kw PEP output with third order distortion products at least 40 db down.

BANDWIDTH: 16 kc

DRIVE REQUIREMENTS: 0.1 w into 52 ohms

POWER SOURCE: 195-255 or 350 to 410 v, three phase, 50/60 cps; 67 kva.



310F-6 HF Receiver-Exciter

KWT-6 HF Transceiver

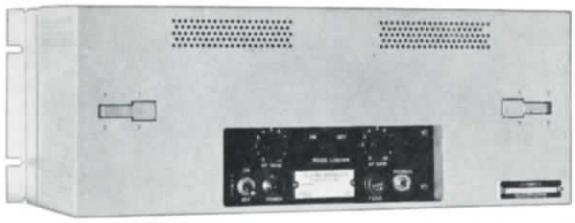
INTEGRATED SSB GROUND STATION EQUIPMENT

An integrated SSB equipment series, built around a fundamental design and common assemblies, includes 500-w transceivers and transmitters, receivers and receiver-exciters. Manually tuned, this rack-mounted equipment covers the 2-30 mc range in 1 kc steps.

Frequency control is effected by a master oscillator which is controlled by a reference signal from a highly stable frequency standard. A plug-in frequency standard module provides stability of one part in 10^6 for at least a month. Another frequency standard may be used consisting of the 40K-1, 8U-1 and 426A-1 (see description, page 85) with an isolation amplifier, providing a stability of one part in 10^8 per day.

The transceiver and transmitter utilize a two-stage, four-band, continuous tuning linear power amplifier with 500 w PEP output. RF feedback provides improved linear operation, and transmitter gain control maintains the proper output level. A pi output network matches a 52-ohm flat unbalanced coaxial line.

This equipment is designed to transmit or receive separate information simultaneously on both upper and lower sidebands on a simplex basis. Because many of the circuit elements are used in both transmission and reception, the equipment cannot transmit on one sideband while receiving on the other.



51N-8 HF RECEIVER

The 51N-8 is a fixed-tuned, crystal-controlled SSB receiver with 2-24 mc range. Crystals may be installed for either upper or lower sideband. Features are a temperature-controlled crystal oven, noise limiter, Mechanical Filter, optional squelch.

STABILITY: 1 part in 10^6 under normal ambient conditions

POWER SOURCE: 110 or 220 v, single phase, 50/60 cps

204C-1 10-KW HF TRANSMITTER

The 204C-1 is a 10-kw PEP linear amplifier for any type of signal within power and bandwidth capabilities with suitable excitation on the operating frequency. The 204C-1 may be tuned manually to any frequency between 4 and 24 mc by front panel controls. Transmitter is 24″ wide, 26″ deep, 86″ high.

OUTPUT IMPEDANCE: 50 ohms with SWR not over 3 to 1

THIRD ORDER DISTORTION: At least 40 db below either of two equal tones separated by at least 90 cps at up to 10 kw PEP output.

DRIVE REQUIREMENTS: 0.1 w PEP into 52 ohms

POWER SOURCE: 230 v, three phase, 50 or 60 cps

32RS-1 100-WATT HF TRANSCEIVER

An SSB voice transceiver with 100 w PEP output, the 32RS-1 has four crystal-controlled, upper sideband channels selected by a panel switch. The equipment occupies 19¼″ of vertical space on a standard 19″ rack. Frequency range is 2-9 mc (9-12 mc with derating on spurious output). Each channel has pre-tuned plug-in coils.

RF IMPEDANCE: 52 ohms

STABILITY: ± 1 part per million

DISTORTION PRODUCTS: −30 db (2-tone test)

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

310F-6 HF RECEIVER-EXCITER

Serves both as a receiver and as an exciter providing 0.2 w excitation to drive a linear power amplifier. Manually tuned, it covers the frequency range of 2 to 30 mc in 1 kc steps. Common use of many elements for both reception and excitation simplifies circuits.

POWER SOURCE: 115 or 230 v, 50/60 cps

KWT-6 500-WATT HF TRANSCEIVER

Employs transceiver design for circuit simplification. Frequency range is 2-30 mc in 1 kc steps with manual tuning. Transmitter power output is 500 w PEP.

THIRD ORDER DISTORTION: 35 db below either of two tones driving the transmitter to rated power.

POWER SOURCE: 115 or 230 v, 50/60 cps

50E-6 HF RECEIVER

This single sideband receiver provides continuous coverage of the 2 to 30 mc frequency range in 1 kc steps.

POWER SOURCE: 115 or 230 v, 50/60 cps

KWR-6 500-WATT HF TRANSMITTER

The KWR-6 is a 500-w SSB transmitter with manual tuning. Continuous coverage of the 2-30 mc range in 1 kc steps is provided.

THIRD ORDER DISTORTION: 35 db below either of two tones driving the transmitter to rated power.

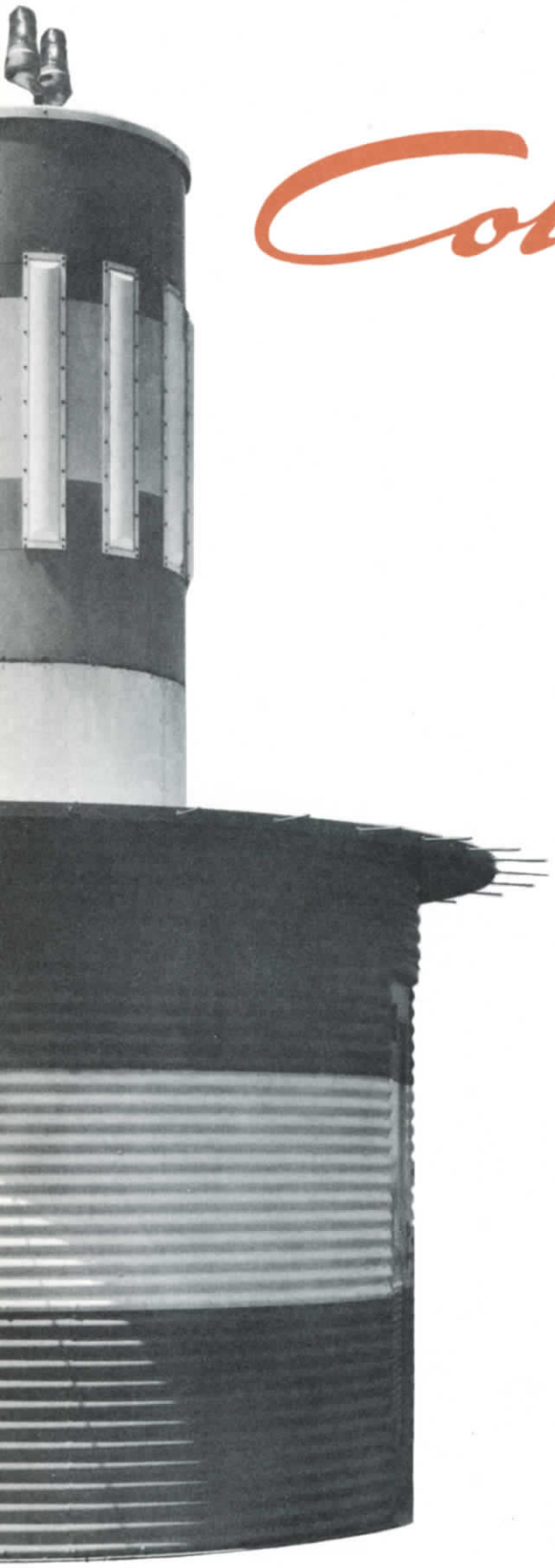
POWER SOURCE: 115 or 230 v, 50/60 cps

ASSOCIATED EQUIPMENT

Accessories available when required are the 512B-2 5-kw PEP balun (see page 76) and the 302C-1 and -2 Directional Wattmeter. For complete test and analysis of equipment performance, the 478R-1 Spectrum Analyzer may be used.

50E-6 HF Receiver

KWR-6 HF Transmitter



Collins VOR SYSTEM

The Collins VOR package installations are ground-based radio transmitting systems for aircraft navigation and letdown. Available as a single 50 w, OR-101; a dual 50 w, OR-201; a single 200 w, OR-301; and a dual 200 w, OR-401.

Both the 50 w and 200 w systems are designed for unattended service and remote control. Maintenance is simplified by advanced circuitry, readily accessible mounting and self-testing features which eliminate the requirements for additional costly test equipment.

The VOR package consists basically of VHF transmitters and precision modulation systems, engineered to the high standard required for this type of service, feeding an antenna system designed for efficient radio frequency radiation of a rotating pattern. Also included is a local control unit providing automatic voice station identification, a precision station monitor with its antenna, the transmitting antenna and accessories.

The 200 w VOR system uses the 200 w 242F-2 VHF Transmitter. The 50 w VOR system is equipped with the 50 w 242F-3 VHF Transmitter. Dual VOR systems include standby equipment with automatic switchover. The 37Y-1 antenna is of straightforward symmetrical design — and requires no intricate auxiliary apparatus, such as goniometer, to produce the desired radiation pattern. A rotating figure-of-eight pattern is produced by means of a motor driven dipole element. In this system the modulated carrier signal is radiated by a fixed cylindrical slotted shell surrounding the rotating dipole.

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

FREQUENCY RANGE: 108-118 mc

HOUSE AND ANTENNA: Approximately 12 ft in dia. and 17 ft high including antenna

OPTIONAL EQUIPMENT: Remote Control Unit, Frequency Regulated Power Supply, Voltage Regulator, Obstruction Lighting Kit.

37Y-1 ANTENNA

The rotating pattern generator, dipole, together with the tone wheel which generates the 9960 cps subcarrier is housed in a shell mounted on the roof deck. Twelve slot-radiators are mounted symmetrically around the periphery of the sheet metal shell enclosing the carrier antenna.

81L-1 RF PHASE SHIFTER

This unit is used to properly adjust the relative phase of the signals emitted by the sideband and the carrier antennas. Approximately 200 degrees of phase shift is provided. It permits the checking and adjusting of RF phasing at any time, as well as permitting operation on a new frequency assignment without tedious cut and try methods of adjusting line lengths.

391A-1 MODULATION-ELIMINATOR

The 391A Modulation-Eliminator removes the 9960 cps, voice and tone modulation from a portion of the transmitter output. The unmodulated rf signal is used to excite the rotating dipole in the VOR antenna. Elimination of modulation is accomplished in a coaxial line type bridge circuit using low impedance power diodes. Modulation level is metered in both input and output circuits.

54J MONITOR

The Monitor continuously samples the amplitude and character of the signals transmitted from the station. It is also useful as a test facility for checking course error at 45° azimuth points and for indication of proper rf phasing.

277B-1 LOCAL CONTROL UNIT

The Collins Local Control Unit combines control and audio circuits in one unit. Automatic voice and/or code identification is provided at no extra cost in accordance with the trend toward both voice and continuous code identification.

242F TRANSMITTER

The transmitters used in the VOR system employ vertical chassis construction. Tubes and transformers are mounted horizontally and are accessible from the front. Wiring is accessible from the rear. All essential circuits are metered to facilitate tuning and maintenance. Spurious output of minus 80 db or better assures freedom from interference with other communication of navigation services.

218A VOR HOUSE

The 218A House is a complete prefabricated steel housing. The structure is designed to provide symmetry for the antenna and adequate space within the structure for the VOR equipment (including standby), storage of test equipment and spare parts. The 218A house comes complete with an internal lighting and power kit.