Collins

SPEECH EQUIPMENT

CATALOG 113

Collins SPEECH EQUIPMENT

FOREWORD

This catalog is prepared for your convenience in selecting equipment that will meet your requirements. The consoles, amplifiers and accessories shown and described are engineered to advanced performance standards. Their operation is reliable, smooth, and straightforward. Thorough consideration has been given to operating detail, in order to incorporate every possible convenience.

The years of successful experience in designing and producing fine audio equipment are reflected in the confidence with which many customers have asked Collins to lay out their entire station facilities.

We will be happy to work with you on the overall specifications of your individualized equipment. By obtaining your full requirements in audio equipment from us, you get not only the best individual units for your purpose, but also the assurance that you have an integrated system with superior overall performance.

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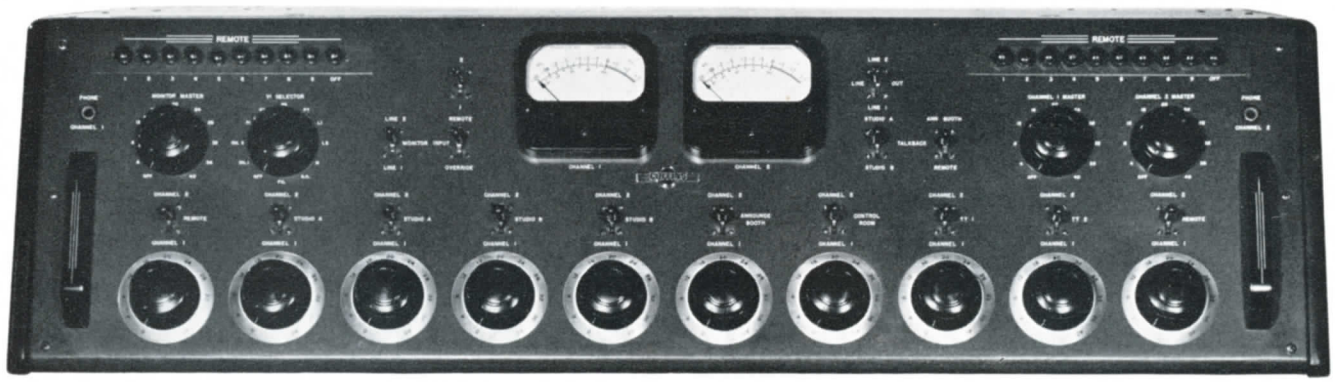
212A-1 SPEECH INPUT CONSOLE

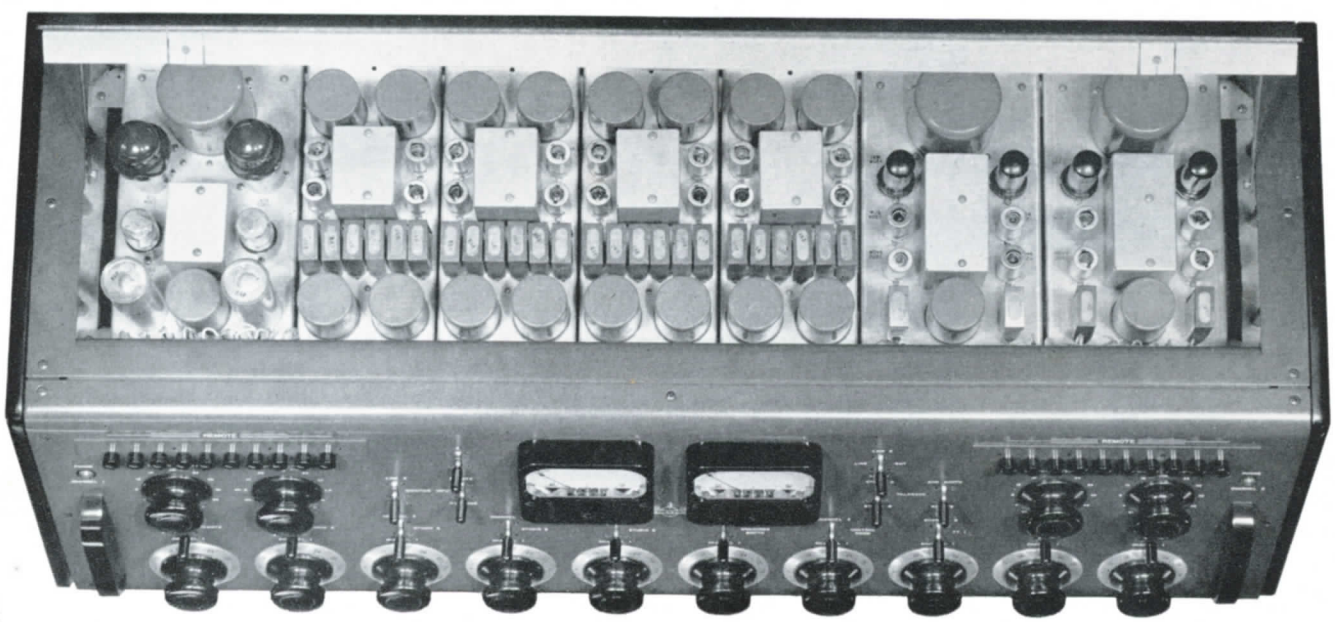


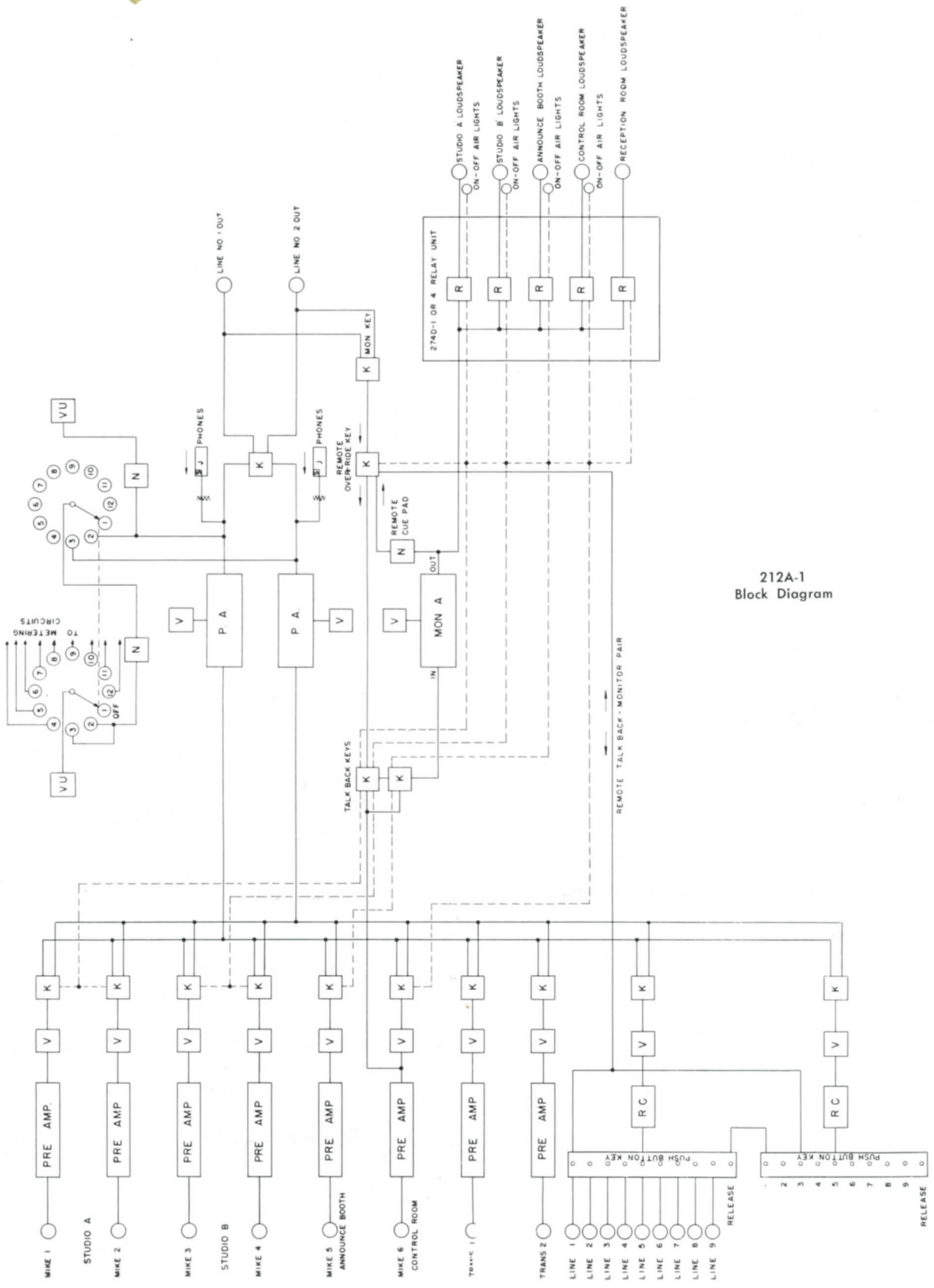
For audio control in AM, FM and television broadcasting, the Collins 212A-1 Speech Input Console provides simplicity of installation, convenience in operation and maximum versatility.

A rotating arrangement allows the entire unit to be tilted for access to the underside of the chassis without requiring additional space. The 212A can be placed against a window, wall or other obstructing surface without sacrificing accessibility or requiring external support when the chassis is tilted. Unit amplifiers are individually mounted on airplane-type shock mounts.

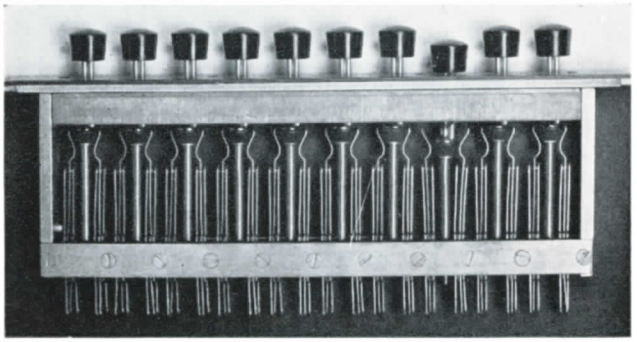
The sloping front panel provides ease of reading and hand movements. Lever-type positive-action switches are employed in line switching circuits, and reliable telephone-type push-button controls are used to connect remote lines. The step-by-step attenuators have a smooth, easy action.

Facilities are provided for auditioning or rehearsing, cueing and broadcasting simultaneously from any combination of two studios, an announce booth, a control room microphone, two turntables, and any two of nine remote lines. Two program amplifiers are included in the 212A-1, making possible the feeding of two independent programs at once or by operating the line reversal switch, providing an emergency amplifier for normal use. A spare key switch is mounted on the panel with leads appearing on the terminal strip.





212A-1
Block Diagram



TELEPHONE TYPE PUSH BUTTON SWITCH

FEATURES AND SPECIFICATIONS:

1. Ten independent input channels, including 6 microphone inputs and 2 low level transcription inputs (eight preamplifiers, one for each of the foregoing) and 2 channels for remote pickups.

2. Any two of nine remote lines can be selected at will. Normal connections are supplied through the switches, so that override in the monitor is possible if desired. The remote channel provides for the feedback of cue to the remote lines, as well as for talkback.

3. Loudspeakers in all studios can be fed from the self-contained monitor amplifier, with selective talkback circuits interlocked to prevent program interruption. Talkback from the control room is possible into any one of three studios or into the remote lines by key switch control.

4. Connections are provided for external "ON THE AIR" lights, with power furnished by the 212A-1 relay units.

5. Two VU meters are incorporated. One is bridged continuously across Program Line 1. The other may be used as a VU meter for the second program amplifier, or to check (by means of a selector switch) individual circuits in the console.

6. Jacks are provided for headphone monitoring of either program amplifier.

7. The construction permits easy access to tubes, components and wiring, without taking the console out of operation.

8. The power is external, with provision for installation of a duplicate power supply. A single supply is capable of operating the equipment with adequate safety factors for long, trouble-free service. However, if two supplies are installed, a changeover is effected automatically in case of failure of the power supply in use. One power supply and the relay unit are included in the purchase of the 212A-1.

Frequency response: Microphone to line, or microphone to speaker, within 2 db total variation from 30 to 15,000 cps at normal gain control settings. Not more than ±½ db additional variation in frequency response over the above range at any other gain control setting.

Input impedance: Microphones 30/50 or 200/250 ohms. Remote Lines 150 or 600 ohms, with repeat coils self-contained. Turntables 30/50 or 200/250 ohms.

Output impedance: Program Line 150 or 500/600 ohms balanced Speakers, maximum of 5, each 600 ohms.

Output level: Program Line VU meter adjustable, +4 to +24 dbm in 1 db steps.

Monitor output: 8 watts.

Distortion: Less than 1% rms harmonic distortion at normal output through line amplifier. Less than 2% rms harmonic distortion at 8 watts output from monitor amplifier. In addition, combination tone distortion is of the same order at the same levels.

Gain: Maximum, microphone to Program Line, 100 db; Remote Line to Program Line, 50 db.

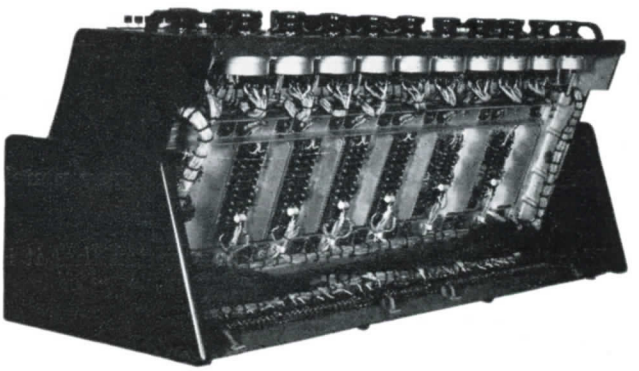
Noise level: With the gain controls adjusted for normal operation with a low level microphone input and with +16 dbm output, but with input terminated in an equivalent resistance, the combined hum and noise in the program output is at least 65 db down.

Power input: 115 volts 50/60 cycles a-c.

Weight: Approx. 150 lbs.

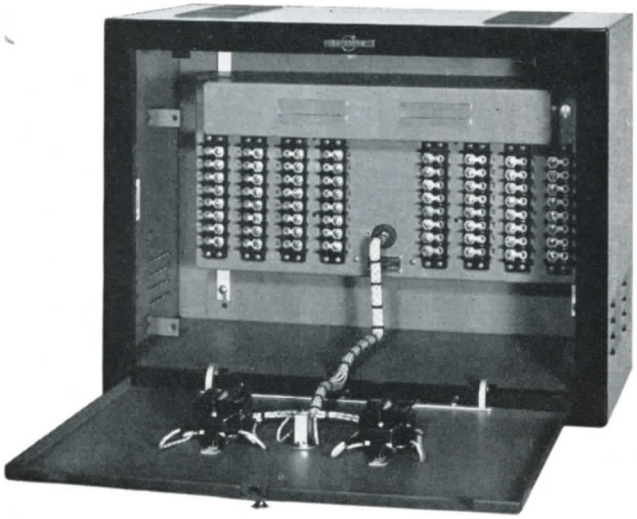
Dimensions: 42″ w, 12″ h, 17½″ d.

See 274D-1 or 274D-4 for relay unit, and 409U-1 or 409U-2 for power supply, both of which are furnished as part of this equipment.



212A-1 CONSOLE TILTED FOR SERVICING

274D-1 RELAY CONTROL UNIT



This Relay Control Unit, used with the 212A console, completely controls studio and control room loudspeakers, as well as studio on-off-the-air lights. Two switches on the hinged front panel control power to the power supply and studio warning lights.

An added feature is a relay switching system with which, by the use of two power supplies, instant uninterrupted service may be effected in case of a failure. Any portion of the operating power supply, including relay and filament power, will operate the changeover.

Terminals are provided for connection to all studio and control room warning lights. Five loudspeakers are also terminated at this point. The relay unit functions as a terminal point for all power connections between the supply and console. No additional relay circuits are necessary for the warning lights.

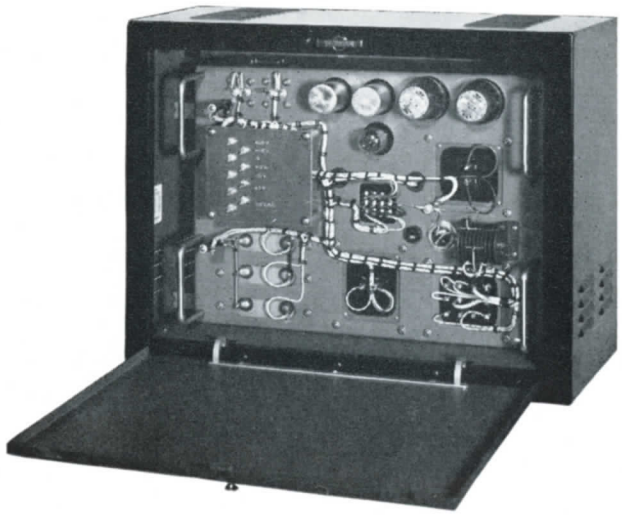
Number of Relays: Five—studio loudspeakers and warning light controls.
Four—power changeover relays.
Input Voltage: 115 volts, 50/60 cycles.
Warning Light Power: 115 volts, 50/60 cycles. Circuit breaker links are supplied for currents up to 9 amperes.
Dimensions: 20½″ w, 15½″ h, 10″ d.
Weight: 17 lbs., 9 oz.
Finish: Glossy black cabinet, metallic gray panel.

274D-4 RELAY CONTROL UNIT

Identical with 274D-1 with the exception that it is constructed for rack mounting.

Dimensions: 19″ w, 8¾″ h, 5½″ d.
Weight: 10 lbs.
Finish: Metallic gray panel, velvet gray cover.

409U-1 POWER SUPPLY



A wall mounting Power Supply for the 212A console, it contains three supplies which furnish d-c power for preamplifiers, monitor and line amplifiers, and 12 volts for relay operation. In addition, it furnishes 6.3 volts a-c to operate all tubes in the console.

The 409U-1 is a stable power supply exceptionally well filtered in high, medium and low voltages. Electrolytic capacitors in the medium voltage circuits are of the plug-in type, while oil filled paper capacitors are used in the high voltage circuits. Tapped primaries on the transformers enable operation over wide voltage ranges. Two separate supplies are included with a single fullwave rectifier in the medium voltage supply, and two fullwave rectifiers in the higher voltage supply, wired in such a manner that program will not be stopped by a failure of one of the tubes.

Input: 105-125 volts 50/60 cycles a-c (by varying transformer taps).
Output: 140 volts d-c @ 60 ma max.
325 volts d-c @ 250 ma max.
12 volts d-c @ 1.0 amp.
6.3 volts a-c @ 10 amps.
Tubes: 2—5R4GY, in high voltage supply.
1—6X5GT, in medium voltage supply.
1—Selenium rectifier in 12 volt supply.
Weight: 70 lbs., 3 oz.
Dimensions: 20½″ w, 15½″ h, 10″ d.
Finish: Glossy black cabinet with metallic gray door.

409U-2 POWER SUPPLY

A rack mounting Power Supply electrically the same as the 409U-1.

Dimensions: 19″ w, 14″ h, 9½″ d.
Weight: 61 lbs., 12 oz.

212F-1 SPEECH INPUT CONSOLE

The Collins 212F-1 Speech Input Console is a flexible packaged unit providing complete control over simultaneous broadcasting and auditioning from any combination of three of eight possible inputs, with provisions for mixing five of twelve possible inputs with the addition of two pre-amplifiers. In addition, the 212F-1 provides for monitoring of program, audition or remote lines, and control of speakers and warning lights.

Superior quality, performance and accessibility are combined in the 212F-1 to make it an outstanding contribution to high-fidelity AM, FM and TV broadcasting or program control in audio systems.

Advanced styling and construction provide an attractive appearance and quick, easy accessibility to all cabling, wiring and sub-units. Excellent ventilation is achieved by louvres in the welded steel cabinet top and sides and through the elimination of tube shields.

Use of highest quality components provides top reliability. The hinged front panel tilts forward, allowing instantaneous inspection or removal of all amplifiers, power supply and relay unit. All plug-in sub-units are provided with Howard Jones connectors and an adapter cord is provided to externally service any unit while the console is in operation. Howard Jones barrier-type terminal strips are provided for all external leads and are readily accessible when the panel is tilted forward.

For desk-top mounting, rubber feet are provided to space the cabinet above the mounting surface. The 212F-1 can be bolted to the mounting surface if desired and spacers and mounting holes are provided.

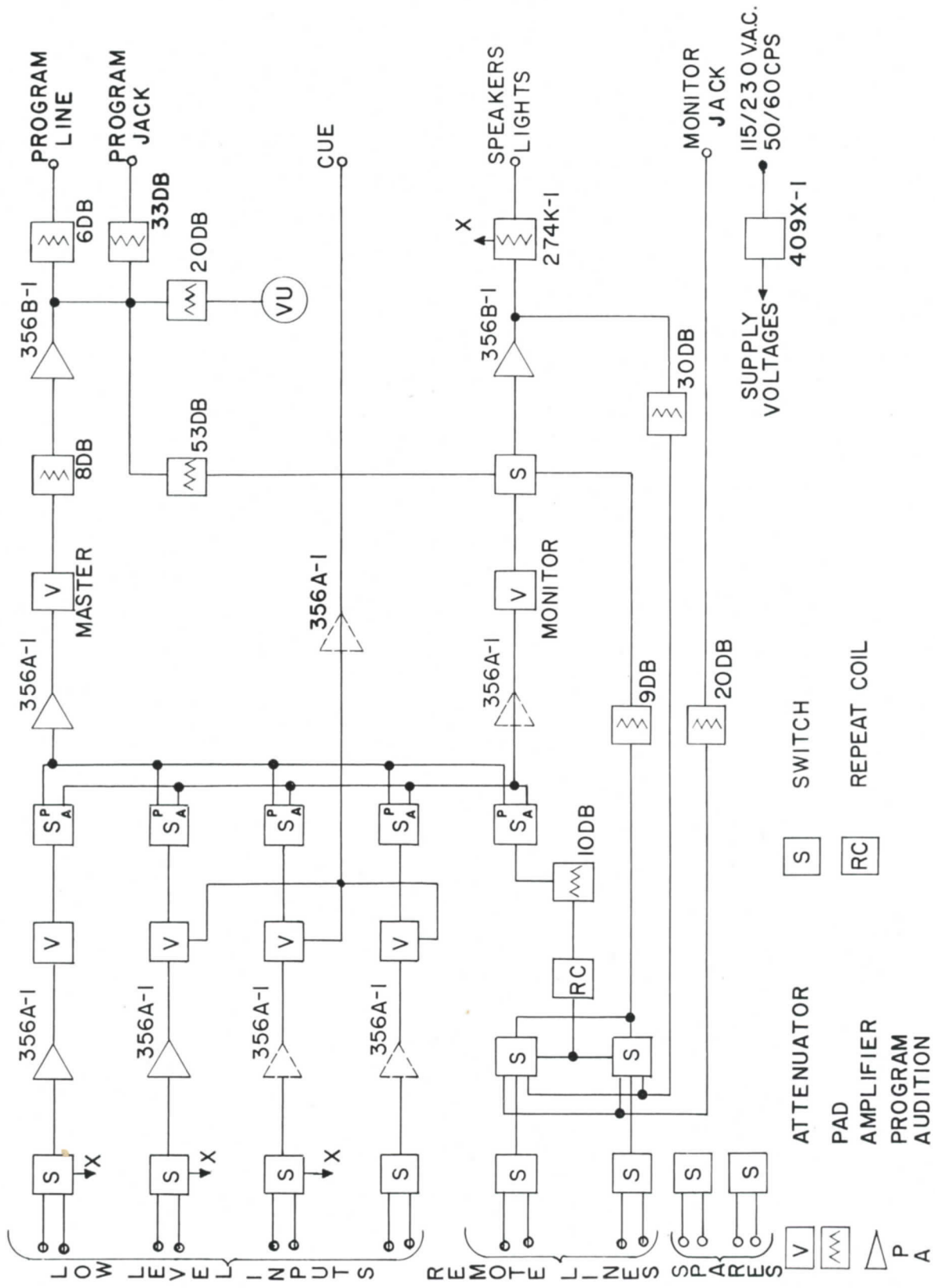
The console cabinet provides all of the space required for the amplifiers, power supply and relay unit. No additional rack cabinet space is needed and the associated interconnecting wiring is eliminated in this self-contained unit.

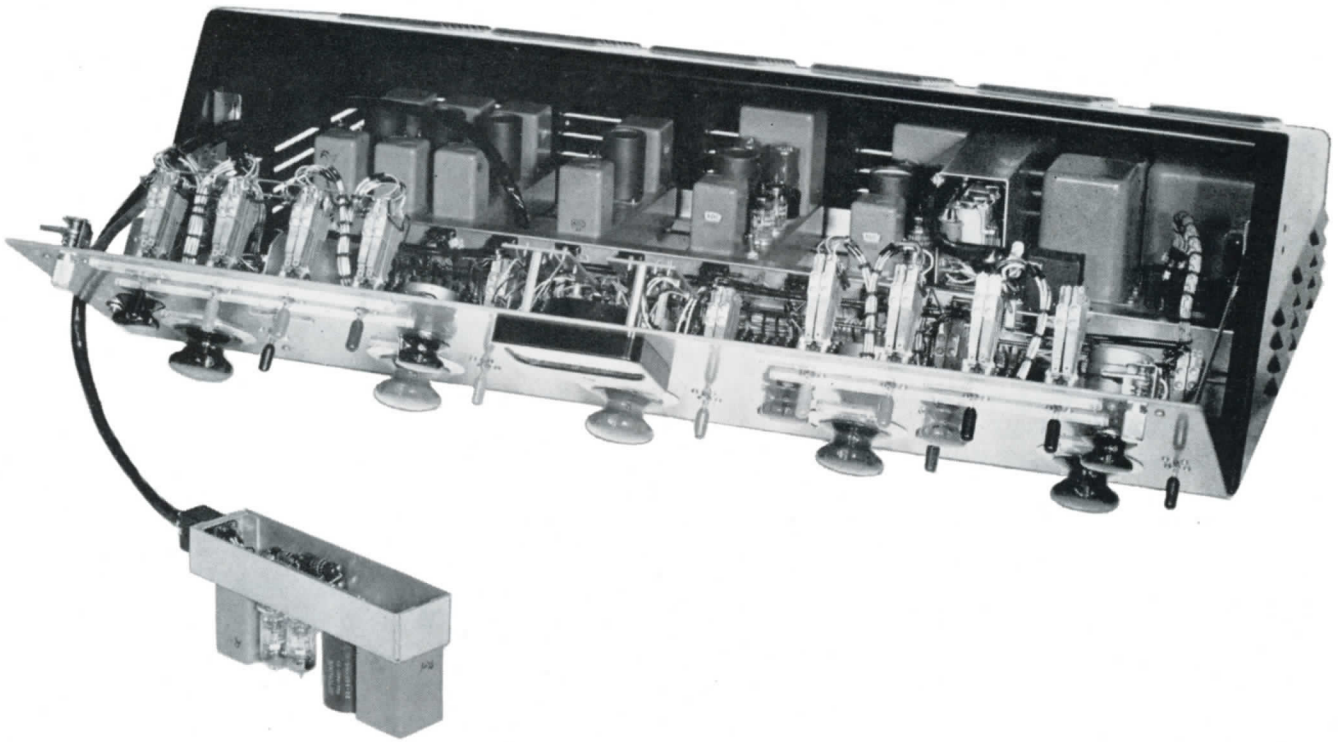
The 212F-1 is especially adaptable for initial installations. Space is provided for additional plug-in amplifiers as demands increase. The pre-amplifier, amplifiers, power supply and relay unit are of the plug-in type, and the 212F-1 may be obtained with the desired initial complement.

The 212F-1 uses only two types of amplifiers and three tube types, resulting in less spare tube maintenance.

As an aid to efficient operation, all mixer knobs and associated key switches are color coded. Write-in strips are provided for the input switches, remote switches and mixer attenuators.

The 212F-1 is supplied with three 356A-1 Pre-amplifiers. Two are used as pre-amplifiers in low level inputs and the third as a booster amplifier in the program channel. Key switches at the low level input terminations allow selection of two of four possible inputs. By moving the 356A-1 Pre-amplifiers to adjacent connectors in the cabinet, four other low level inputs are available. The


PROGRAM LINE
PROGRAM JACK
CUE
SPEAKERS LIGHTS
MONITOR JACK
115/230 V.A.C. 50/60CPS
SUPPLY VOLTAGES
409X-1
6DB
33DB
20DB
VU
356B-1
53DB
8DB
30DB
X
274K-1
356A-1
MASTER
MONITOR
9DB
20DB
10DB
RC
LOW LEVEL INPUTS
REMOTE LINES
SPARES
ATTENUATOR
PAD
AMPLIFIER
PROGRAM AUDITION
SWITCH
REPEAT COIL



plug-in type of construction allows easy removal or relocation of the units.

The purchase of four additional 356A-1 Preamplifiers will provide simultaneous mixing of five of twelve possible inputs, a booster amplifier for the monitor circuit and a cueing amplifier. No rework will be required to add these additional facilities, as units are plug-in type and the necessary wiring is incorporated in all of the 212F-1 broadcast consoles. Two spare lever switches are provided for any desired custom wiring.

The block diagram on the opposite page shows the 212F-1 system. Components not supplied but provided for are shown as dotted units.

Lever switches allow selection of two possible inputs for each 356A-1 Preamplifier. The 212F-1 uses high level mixing following 40 db gain in the preamplifiers. The mixer attenuators are step-type attenuators whose outputs are connected to key-type lever switches. The lever switches terminate into the program bus, audition bus or resistive termination.

The program bus feeds an additional 356A-1 Preamplifier being used as a booster amplifier for 40 db gain. A step-type ladder attenuator for the master gain control and a fixed pad precede the program amplifier. The 356B-1 Program/Monitor Amplifier is set for a 56 db gain. The output of the program amplifier is isolated from the program line by a 6 db pad. A VU meter wired to the output of the program amplifier provides accurate measurement of the output level.

Remote line operation incorporates two lever and two rotary switches to select proper circuitry for incoming or outgoing program, audition or cue signals.

Three of the low level mixer attenuators have cueing positions. The output of the cue circuit will operate headphones, or a 356A-1 Preamplifier may be plugged in to provide 100 milliwatts to a speaker.

Four relays in the 274K-1 Relay Unit are operated by the lever switches in the first three low level input channels. These relays will control the operation of the warning lights and speakers in four studios.

An optional feature available is the Collins 356E-1 Limiter Amplifier. This plug-in module, designed for use with the 212F-1, can be inserted in place of the 356B-1 Program Amplifier, allowing unattended operation. By removing the 6AL5 bias rectifier tube, the 356E-1 becomes a straight program amplifier and the 356B-1 Program Amplifier supplied with the basic 212F-1 is not needed.

SPECIFICATIONS

Audible Noise: None, relay noise damped by mounting relays on rubber.

Exterior Finish: Metalized blue-gray enamel front panel with white silk-screened letters. Cabinet finished with black baked enamel.

Ambient Temperature Range: +15°C to+45°C.

Ambient Humidity Range: Up to 95%.

Number of Modules: The 212F-1 consists of the cabinet assembly and the following modules:
Three — 356A-1 Pre-amplifiers.
Two — 356B-1 Program/Monitor Amplifiers.
One — 274K-1 Relay Unit.
One — 409X-1 Power Supply.

Power Source: 115 or 230 volts a-c ±10%, 50/60 cps, single phase.

Number of Channels: Two low level inputs with provision for four low level input channels with the addition of two more 356A-1 Pre-amplifiers. One remote input, one program output and four monitor outputs. Cueing output from three of the low level mixer attenuators.

Input Impedance: Low level — 30/150/250/600 ohms balanced or unbalanced.
Remote lines — 150/600 ohms.

Output Impedance: Program line — 150/600 ohms.*
Monitor — 150/600 ohms.*

*Shipped wired for 600 ohms.

Input Level: Low Level: –60 db nominal (100 db gain). Remote: +10 dbm.

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

Output Level: Program Line: +18 dbm (50 mw). Monitor: +39 dbm (8 watts).

Response: Audio ±1½ db, 50 to 15,000 cps at program line.

Distortion: Less than 1% at +18 dbm at program line. Less than 3% at 8 watts out of the monitor amplifier.

Noise: Less than –118 dbm at low level input.

Crosstalk: Greater than 50 db below program level, 30 to 20,000 cps.

Controls: External: Four low level gain controls, one remote line gain control, one monitor gain control, one master gain control, four low level selector switches, two remote line selector switches, five program/audition switches, two remote line off/cue/phone/mix switches, one program/audition/cue switch, two spare lever switches.

Internal: One toggle gain switch on each 356B-1 Program/Monitor Amplifier.
One voltage adjust rheostat on the 409X-1 power supply.

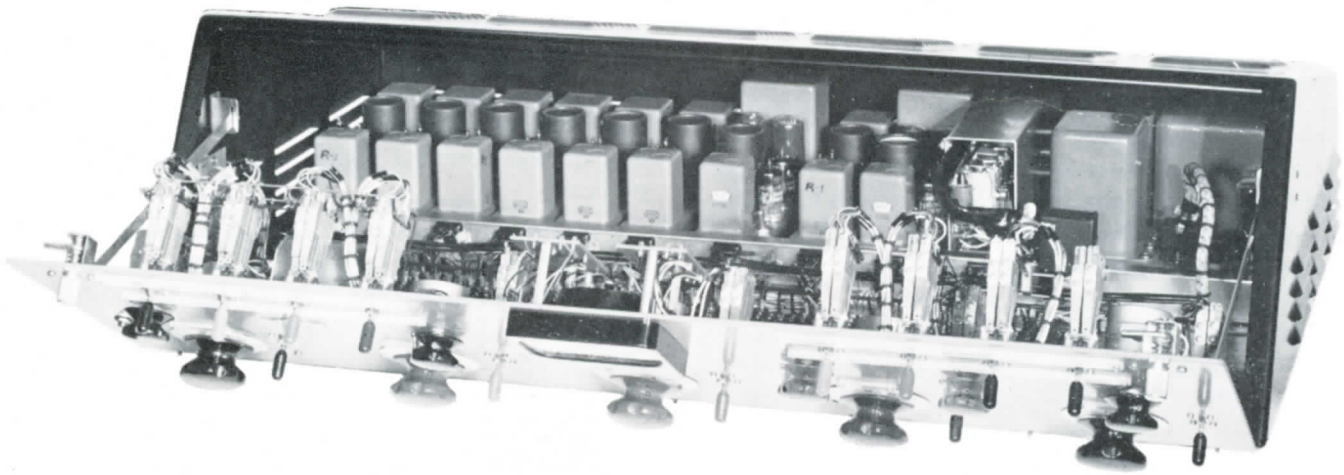
Protective Devices: Protective fuses are provided in the primary supply voltage and d-c voltage leads.

Indicating Devices: A VU meter across the program line.

Operational Aids: Each mixing channel has colored knobs for its switches and attenuator, reducing operational errors.
Lights in the VU meter.
Write-in strips for the low level and remote line switches.

Weight: 100 lbs.

Size: 22″ deep at base, 35″ wide, 10¼″ high at front, 7$\frac{3}{16}$″ high at back.



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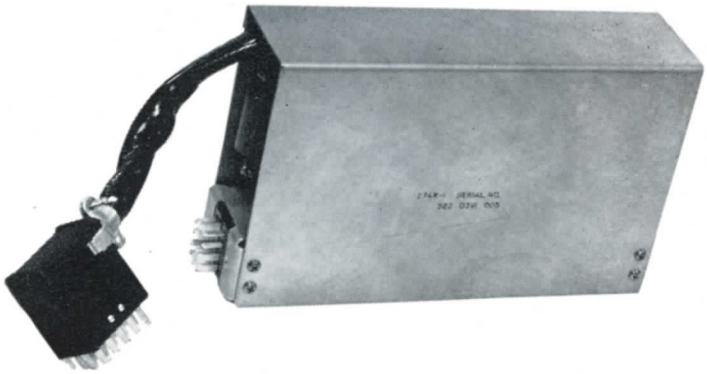


274K-1 RELAY UNIT

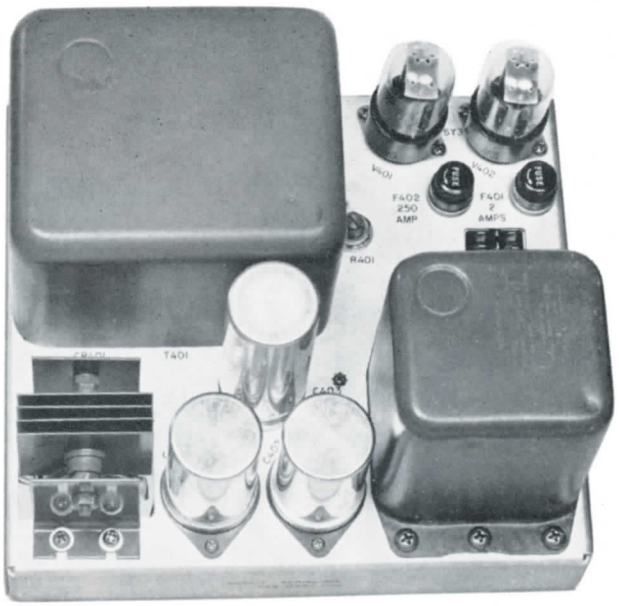
The 274K-1 is a plug-in module used in the 212F-1 Speech Input Console. Four relays control studio speakers and warning lights. The unit is provided with a cover to protect relay contacts from dust and damage while handling. Each relay is provided with a series shunt circuit to minimize switching transients and arcing. Noise is held to a minimum by mounting the relays on rubber. When used with the 212F-1 Console, the 409X-1 Power Supply provides the 12 volts d-c at 560 milliamperes and studio wiring provides power for the warning lights.

Connectors: Howard Jones P-312-AB connector mounted on the front surface and a Howard Jones P-315-CCE connector on a 5½″ pendant cable.

Size: 5½″ h, 2½″ w, 9″ d.

Weight: 2½ lbs.

212F-1 STUDIO CONSOLE TEST CABLE



409X-1 POWER SUPPLY

The 409X-1 Power Supply is a plug-in unit designed for use in the Collins 212F1 Speech Input Console.

Tubes: 2 — 5Y3.

Output Voltages: Up to 250 ma. at 300 volts d-c, adjustable.
6.0 amperes at 6.3 volts a-c.
12 volts d-c.

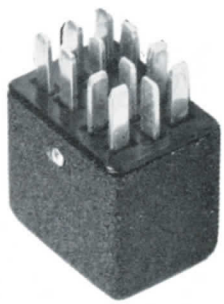
Power Source: 115 or 230 volts a-c, ±10%, 50/60 cps single phase.

Power Input: 225 watts maximum.

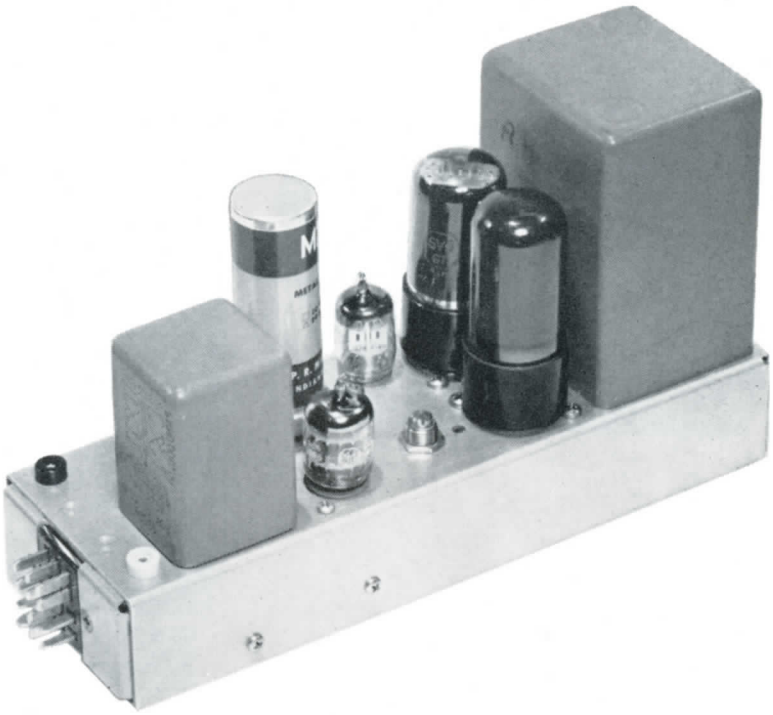
Protection Devices: Overload fuses in the primary supply and output voltage leads.

Dimensions: 9½″ l, 7½″ w, 6″ h.

Weight: 25 lbs.



212F-1 STUDIO CONSOLE JUMPER PLUG



356E-1 LIMITER AMPLIFIER

The 356E-1 Limiter Amplifier is a plug-in module which acts as an automatic average level or peak limiting amplifier in broadcast, TV and microwave audio systems. It consists of a push-pull variable gain input stage driving a push-pull output stage. A bias rectifier provides bias to regulate gain of the input stage. A decal to convert a VU meter to a gain reduction meter is furnished with the 356E-1.

The 356E-1 was designed for use with the Collins 212F-1 Speech Input Console, permitting unattended remote audio operation. However, it can be used to control level differences between two or more sources, as a program line compressor, expander-compressor operation or as a program amplifier.

Input Impedance: Unloaded transformer, source impedance 150 or 600 ohms.

Input Level: –54 dbm to –24 dbm with threshold control set at 0 dbm output.
–34 dbm to –4 dbm with threshold control set at +20 dbm output.
–24 dbm to +6 dbm with threshold control set at +30 dbm output.
NOTE: 0 dbm = 1 milliwatt across 600 ohms.

Output Impedance: 150 or 600 ohms, balanced or unbalanced.

Output Level: 0 dbm to +18 dbm, with threshold control set at 0 dbm output.
+20 dbm to +30 dbm, with threshold control set at +20 dbm output.
+30 dbm to +36 dbm, with threshold control set at +30 dbm output.

Response: ±1 db, 50 to 15,000 cps.

Distortion: 1.5% maximum, 50 to 15,000 cps no compression.
2% maximum, 50 to 15,000 cps at any level up to 30 db gain reduction with threshold set at +20 dbm output.

Output Noise: –50 dbm or less (with threshold control set for +20 dbm output).

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.
5.2 seconds for 63% recovery with switch set for average operation.

Gain: 54 db.

Controls: Dual/average toggle switch at top near front of chassis.

Operational Aid: 1. Test points for measuring bias voltage in adjusting threshold control.

Tubes: 1 — GL-6386 — Variable Gain Input Amplifier.
2 — 6V6GT — Output Amplifier.
1 — 6AL5 — Bias Rectifier.

Power Source: 6.3 VAC at 1.55 amperes.
+300 VDC at 77 milliamperes.

Size: $5\frac{5}{16}$″ h, 3″ w, 9″ d, plus connector.

Weight: 5 lbs.

212Z-1 REMOTE AMPLIFIER

The Collins 212Z-1 four channel Remote Broadcast Amplifier is a rugged transistorized unit retaining the outstanding qualities of its predecessor, the 12Z, and adding many more. Design details of the 212Z-1 were influenced by answers to a questionnaire mailed to a representative sample of broadcast stations across the country.

Among the features of the 212Z-1 are a power source of both 115 VAC and batteries, with automatic changeover both when a-c power fails and when it is restored; self-contained batteries with life of approximately 75 hours; new light weight; maximum gain of 90 db; tone oscillator for line-level set up; auxiliary output for public address feed; transistors and printed wiring. Step faders rather than composition type faders are used. Four microphones can be accommodated.

The photograph above shows the 212Z-1 with carrying case open. Apparent are the convenient sloping panel and low height, the well placed and properly shaped knobs, the large illuminated VU meter and individual channel plastic write-in strips.

A distinctive finish of black and metallic blue-gray gives the 212Z-1 an attractive abrasion-resistant finish.

All terminals and jacks (except the line and program monitors) are located at the rear of the unit, insuring that the operator's movements will be unimpaired by bulky cords and cables.

One or two headsets may be plugged into the monitor jacks. Where loudspeaker monitoring or feed for local PA is desired, the PA terminals are used, and an individual gain control allows the operator to handle the program and simultaneously ride gain on the PA system.

A "multiple" jack is located on the side of the unit, permitting two 212Z-1's to be used simultaneously and controlled by one master gain control.

The 212Z-1 is housed in a compact rugged Royalite carrying case which has space to house the power cord also supplied with the unit. The 212Z-1 is fastened to the bottom of the case and all that is necessary for most remote applications is removal

of the top. However, the unit can be easily removed and operated at permanent locations. The 212Z-1 weighs only 22 pounds in carrying case with batteries, a radical departure from the relatively bulky and inflexible remotes in common use.

Four Cannon XL-3-13N microphone receptacles (accommodate XL-3-12 plugs) are supplied with the standard unit, and other connectors are available on special order at no additional cost.

Batteries are not included as standard equipment with the 212Z-1 and should be ordered separately.

In the block diagram on the next page, the four preamplifiers Q1 through Q4 use 2N106 hermetically sealed low noise transistors. The input faders feed the second pre-amplifier Q5 (also a 2N106) through the tone oscillator switch. The booster Q6 feeds the master gain control, which is followed by the driver, Q7.

The booster and the driver both employ 2N64 transistors. The output amplifier (Q8 and Q9) has push-pull 2N44 transistors with transformer coupling on the input and output sides. Transformer T-2 feeds the program monitor, the VU meter, and the public address line and program switch. Provisions are made for two program lines and telephones through the output switch.

The power supply is a shielded, filtered full-wave supply employing germanium diodes and multisection filtering. A cutover relay connects the batteries to the amplifier whenever the a-c line voltage fails.

The 400 cps tone oscillator employs a Colpitts circuit and feeds a low level signal to the second pre-amplifier through a selector switch. A power interlock switch insures that there is no battery drain when the unit is in its closed carrying case.

The four channel mixing circuit incorporated in the amplifier is designed to work with all microphones 30 to 600 ohms.

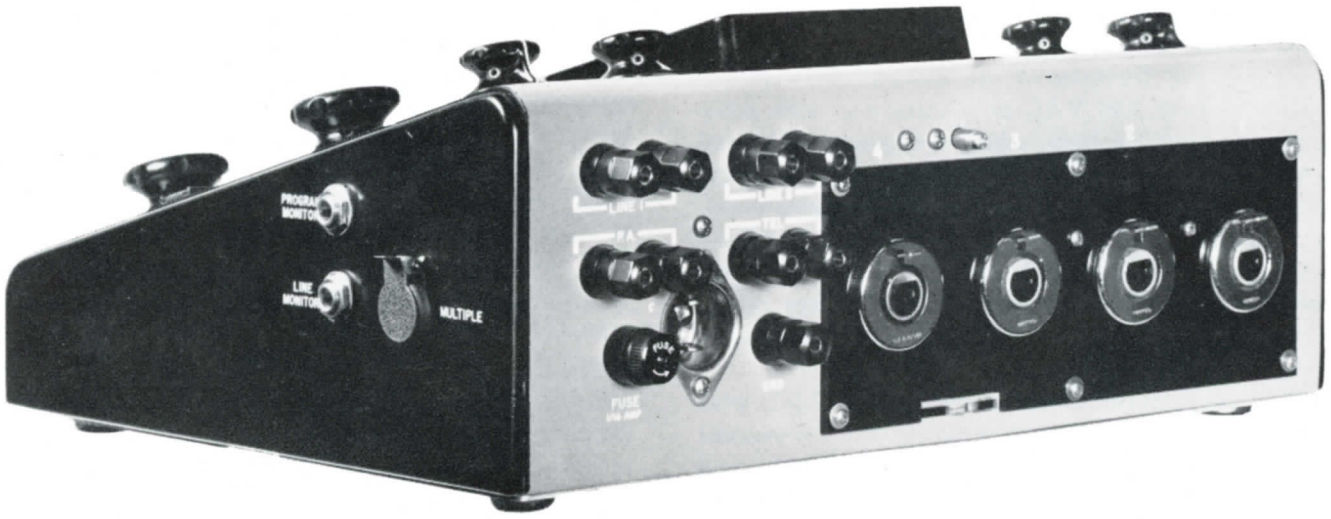
The output circuit is designed to match a 600-ohm line. To work into 150 ohms, the use of an external repeat coil 600 ohm / 150 ohms is recommended. Minor rework of the unit will also provide 150 ohms.

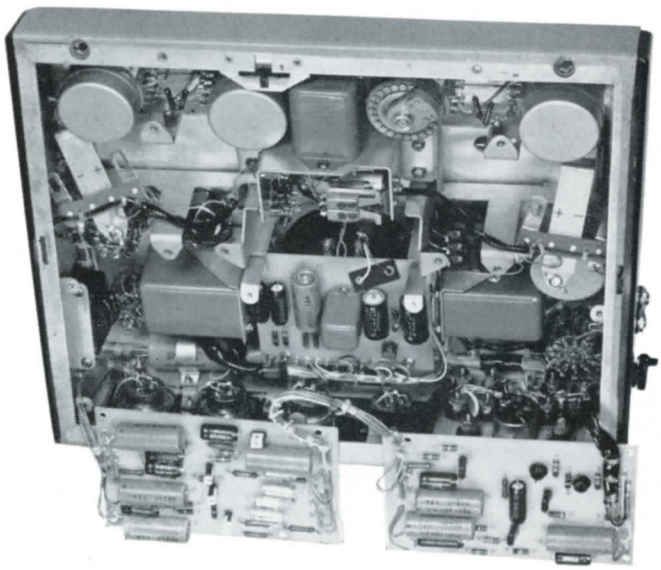
When a telephone set is connected to the "Tel" posts, the line can be used for communication with the master control room.

Although simultaneous program feed and communication cannot take place over a single line at the same time, the output switch allows rapid interchange between the line of the telephone set for communication and the amplifier output for program transmission. This facilitates operation where only one line is available to the control point or radio transmitter.

When two lines to the master control are available, one can be used for program feed or receipt of cue preceding transmission, and the other for simultaneous communication. With this arrangement, the communication line can be substituted immediately for broadcast by simply turning the output switch and making a corresponding switch in the master control room. This rapid interchange feature between the two lines at the remote point provides a necessary safety factor, especially valuable when important programs are being broadcast.

If a telephone set is not readily available, it is possible to carry on communication by using the

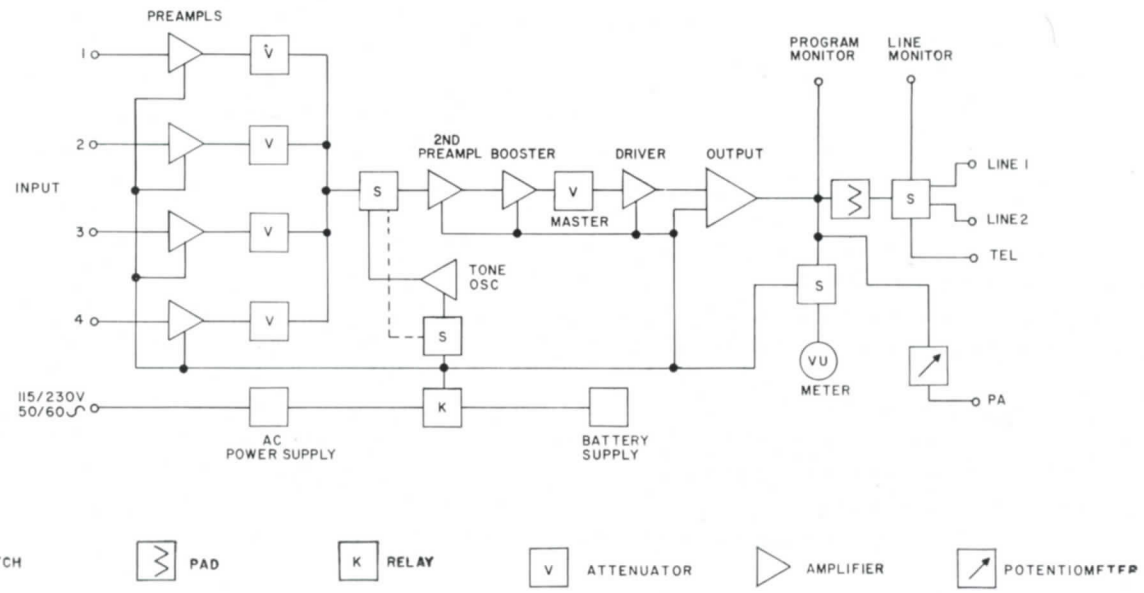


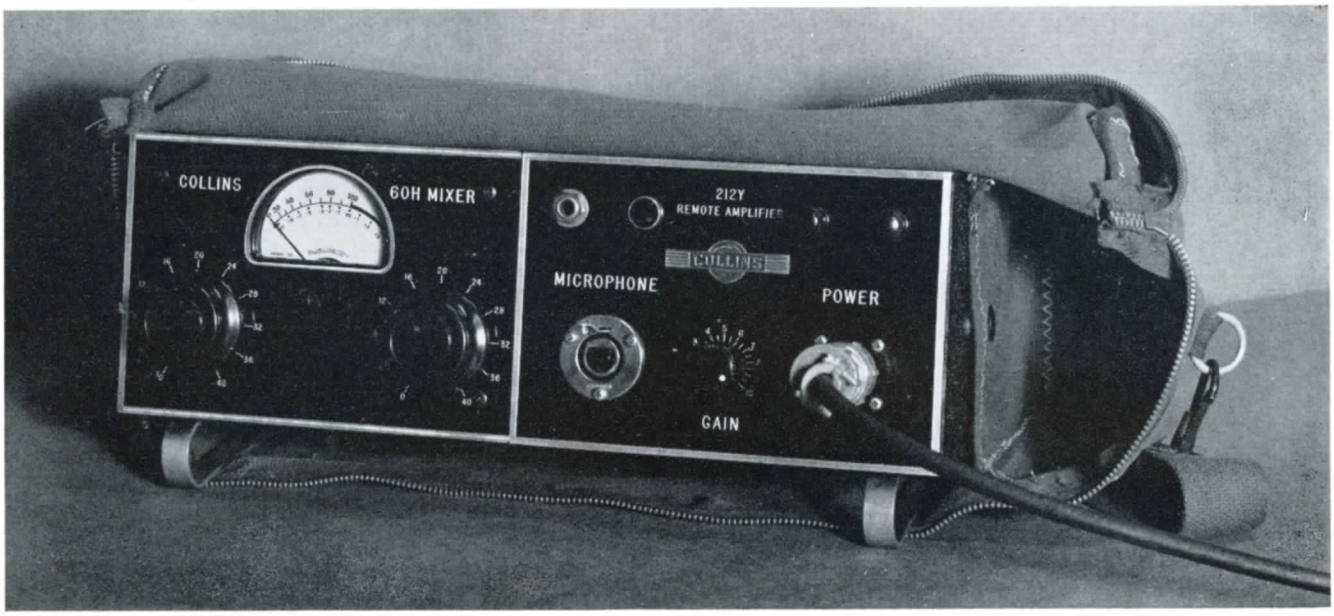


announcing microphone and amplifier for outgoing speech and the monitor headset for incoming speech.

SPECIFICATIONS

Input: Four channels selected by faders numbered to correspond with input plugs.
Input Impedance: 25 to 600 ohms.
Gain: 90 db minimum.
Noise Level: –110 db equivalent noise figure.
Power Output: Normal –3.2 milliwatts (+5 dbm).
High — 12.7 milliwatts (+11 dbm).
Distortion: Less than 1% at typical levels.
Frequency Response: ±1.5 db 50-15,000 cps.
Output Impedance: 600 ohms (150 ohms available).
Case: Welded aluminum with removable bottom plate for access, finished in black and medium blue-gray.
Microphone Connections: Cannon XL-3-13N supplied.
Cannon P-3-13, Hubbell 7557, Cannon UA-3-13 or UA-3-14 available at no added cost.
Power Source: 115 or 230 VAC 50/60 cps or self-contained batteries (supplied wired for 110 VAC). Batteries are low cost standard types, one 4.5 volt Burgess D-3 or Eveready 726, and two 22.5 volt Eveready 763. 22.5 volt battery life approximately 75 hours. 4.5 volt approximately 90 hours. (Batteries not supplied with 212Z-1).
Ambient Temperature Range: 0-45°C.
Ambient Humidity Range: Up to 95%.
Weight: 22 lbs. complete with batteries in case.





212U TWO-CHANNEL REMOTE AMPLIFIER

The 212U consists of a 60H Mixer and a 212Y Amplifier. Both units are mounted in a single aluminum cabinet. A convenient carrying case with a carrying handle and a shoulder strap is provided.

To operate this equipment the canvas carrying case may be removed, or, in bad weather, the front of the case may be opened by slide fastener for access to the controls. A snap-fastened flap at the rear of the case allows connection of the microphones. The a-c cord provided is connected to the 212Y unit. If battery operation is required, a Collins type 412C-2 battery box and interconnecting cable must be used. The battery box is not included in the 212U equipment. Line connections are made through binding posts on the 212Y unit.

The mixing controls are ladder type attenuators, with db calibrations on the front panel. The master gain is the volume control on the 212Y. Legs raise the front of the unit to a convenient operating height. The meter is a standard 3″ VU meter with an adjustable range extension network. A phone jack on the 212Y panel allows headphone monitoring.

SPECIFICATIONS

Input Impedance: 212U-1, 30/50 ohms.
212U-2, 150 ohms.
212U-3, 200/250 ohms.

Output Impedance: 600 ohms.

Power Output: +17 dbm (1 milliwatt 600 ohms reference level).

Distortion: Less than 1½% between 50 and 15,000 cps.

Noise Level: Better than 65 db below program level.

Frequency Response: ±2 db between 30 and 15,000 cps.

Gain: 85 db less mixer insertion loss.

Mixer Insertion Loss: Approximately:
212U-1, 6 db.
212U-2, 10 db.
212U-3, 4.5 db.

Tubes: 2-6AQ6, 1-6AK6, 1-7Y4.

Gain Controls: Master gain, high resistance potentiometer.
Mixers: Ladder type attenuators.

Number of Input Channels: Two.

Microphone Receptacles: Cannon type XL-3-13; adapters available for other standard types.

Finish: Black anodic aluminum panel, black wrinkle cover.

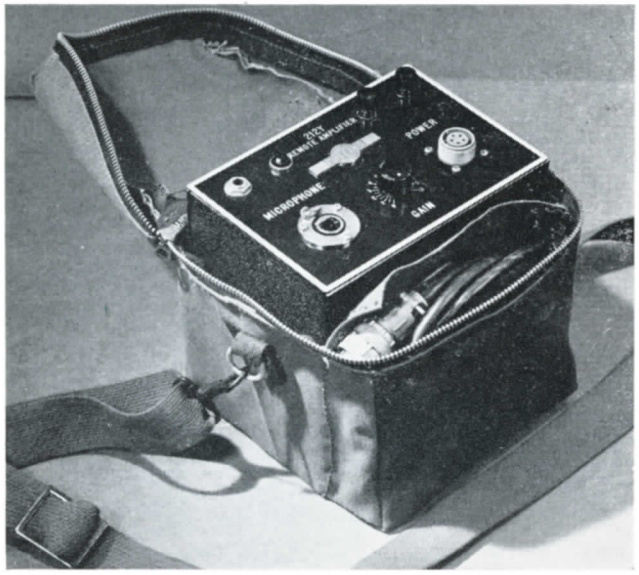
Carrying Case: Leather reinforced canvas with slide fastener and pouch for power and microphone cables, canvas carrying handle and shoulder strap.

Size: 14″ w, 6″ h with legs (4¾″ less legs), 7½″ d.

Weight: 13 lbs.

Power Source: 115 volts a-c 60 cps. Power supply is self-contained.

Battery Operation: Requires 412C-2 battery box.



212Y SINGLE CHANNEL REMOTE AMPLIFIER

The Collins 212Y Remote Amplifier combines small size and light weight with high fidelity. Careful engineering design has produced an extremely compact, completely accessible unit suitable for dance orchestra and newsroom pickups, sports broadcasts, and any other applications where fast "set up" is important or necessary. The low cost of the 212Y further suggests its permanent installation at points where pickups are made regularly.

The design of the 212Y includes all features necessary to provide dependable remote operation. One high fidelity channel is incorporated, which operates from a low level velocity, dynamic or other self-generating microphone. A universal input transformer matches all low impedance commercial type microphones.

The 212Y Remote Amplifier is available in two models; the 212Y-1, which has a Cannon XL-3-13 microphone connector, and the 212Y-2, which has a Cannon P3-13 microphone connector.

Three stages of amplification provide an overall gain of 85 db, with an output of +17 dbm.* A headphone jack connected across the output terminals permits program monitoring as well as talk-back from the studio.

Because of its simplified construction, installation and operation, the Collins 212Y can be handled by non-technical personnel without fear of program failure.

The front of the leather reinforced carrying case, which has a pouch for power cord and microphone cable, opens by slide fastener to allow full access to all controls and connections. If desirable, the case may be removed completely. Line connections are made to binding posts, and the supplied a-c power cord is plugged into the front panel.

If battery operation is required, the interconnecting cable from a 412C-2 battery box is connected. Merely exchanging plugs in the power input receptacle permits quick change from a-c to d-c operation. The battery box is not supplied with the 212Y.

The amplifier slides into its case and is fastened by one Dzuz fastener.

212Y SPECIFICATIONS

Number of Channels: One.

Gain: 85 db max.

Input Impedance: 30/50 ohms or 200/250 ohms.

Output Impedance: 600 ohms.

Power Output: +17 dbm.*

Distortion: Less than 1.0% between 30-15,000 cps.

Noise Level: 65 db below normal program level.

Tubes: 2 6AQ6, 1 6AK6, 1 7Y4.

Frequency Response: Within 1.0 db; 30-15,000 cps.

Gain Control: High resistance potentiometer.

Microphone Receptacle:

212Y-1—Cannon type XL-3-13 (Adapters available for other standard types.)

212Y-2—Cannon type P3-13.

Finish: Black anodic aluminum panel, black wrinkle cover.

Carrying Case: Leather reinforced canvas with pouch for power and microphone cables.

Power Source: 115 volts a-c, 50/60 cps. Power supply is self-contained.

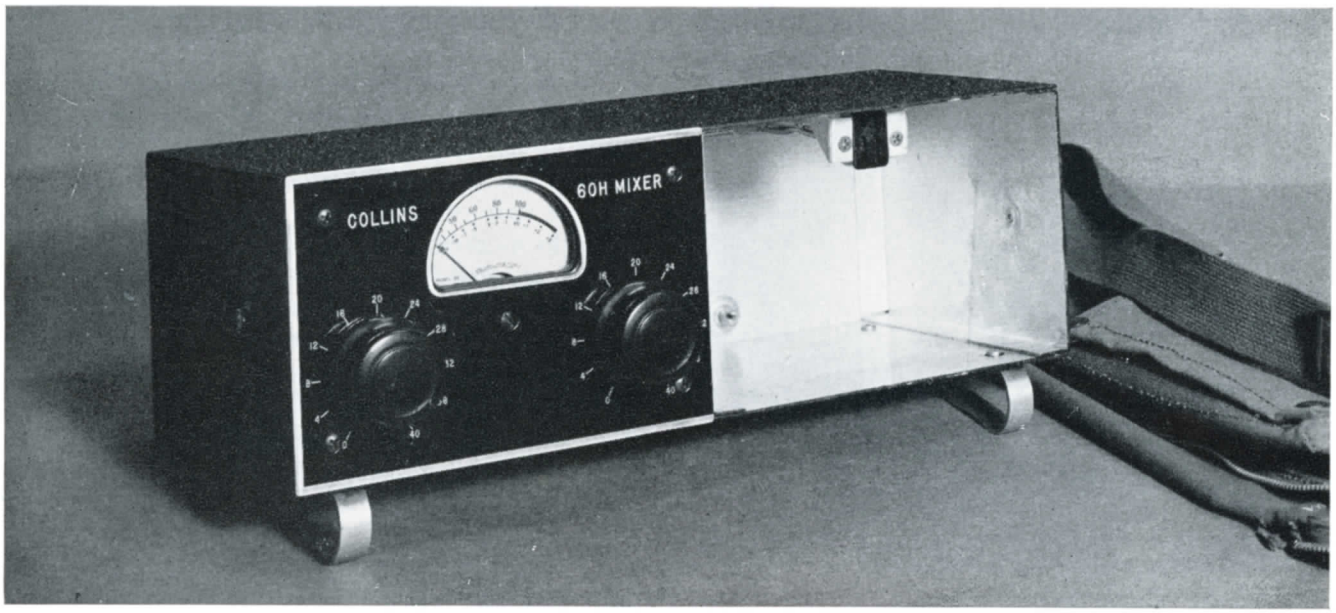
Battery Operation: Requires 412C-2 battery box and interconnecting cable.

Weight of Battery Box: Approx. 16 lbs. including batteries.

Size: 7″ w, 4¾″ h, 6¼″ d.

Weight: 10 lbs.

**1 milliwatt, 600 ohm base.*



60H TWO-CHANNEL REMOTE MIXER

The Collins 60H Mixer is a two-position, low-level mixer used in conjunction with the Collins 212Y Remote Amplifier. It consists of a mixer chassis in a cabinet which has an opening for the insertion of the 212Y Amplifier, and a convenient canvas carrying case with both a carrying handle and a shoulder strap.

The 212Y slides into the 60H mixer case exactly as it does into its own case. A built-in plug and socket arrangement handles the interconnection problem at the same time the amplifier is installed in the mixer case.

A standard 3-inch VU meter with adjustable range extension attenuator is provided for monitoring of the program material, while headphone monitoring is accomplished as before in the 212Y amplifier. The two ladder type attenuators are furnished with convenient control knobs having decibel calibration on the front panel. The volume control on the 212Y will then serve as a master volume control.

The mixer rests upon two removable legs which raise the knobs to a convenient height and tilt the panel at an angle to afford sight of the dial calibrations and meter scale. The microphone connections are at the rear of the cabinet. The canvas carrying case is equipped with two snap fasteners to hold the case on the mixer when operating in inclement weather. A flap on the rear of the case opens to allow insertion of the microphone connectors and at the same time protects them from the weather.

60H SPECIFICATIONS

Input Impedance: 60H-2, 30/50 ohms.
60H-3, 150 ohms.
60H-4, 200/250 ohms.

Output Impedance: 60H-2, 50 ohms.
60H-3, 250 ohms.
60H-4, 250 ohms.

Insertion Loss: 60H-2, 6 db.
60H-3, 10 db.
60H-4, 4.5 db.

Gain Controls: Ladder type attenuators, step by step.

Number of Input Channels: Two.

Microphone Receptacle: Cannon type XL-3-13. Adapters are available for other standard types.

Finish: Black anodic aluminum panel, black wrinkle cover to match 212Y.

Dimensions: 14″ w, 6″ h with legs (4¾″ h less legs), 7½″ d.

Carrying Case: Leather reinforced canvas with slide fastener and pouch for power and microphone cables; canvas carrying handle and shoulder strap.

Weight: Mixer and carrying case only, 6 lbs.

412C BATTERY BOX

The 412C-2 battery box is sturdily constructed, holding the batteries securely. There is room in the top of the case for storing the 6 ft. rubber-jacketed cable for transportation. Three thumb screws hold the clamp which secures all of the batteries in place. A convenient carrying handle is provided. Batteries not furnished.

Finish: Black wrinkle.

Dimensions: 10¾″ w, 6½″ d, 9¾″ h.

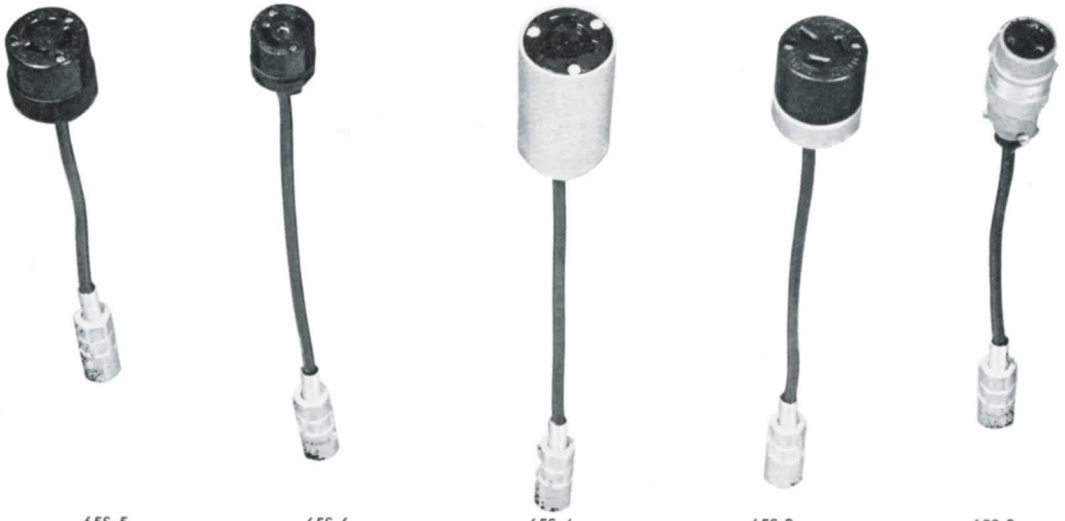
Weight: With batteries approximately 22 lbs.

Requires standard low cost type batteries:

4—Burgess M30 or Eveready 482 or equivalent.

5—Burgess 4F or Eveready 742 batteries, or equivalent.

MICROPHONE ADAPTERS



65S-5
WITH HUBBELL
7555

65S-6
WITH HUBBELL
7484

65S-4
WITH HUBBELL
23002

65S-3
WITH HUBBELL
7082

65S-2
WITH CANNON
P3-CG-11S

Adapters using other type connectors available on special order

CUSTOM DESIGNED SPEECH EQUIPMENT

While the regular Collins line of audio equipment is very comprehensive, operating methods in individual stations sometimes demand a special combination of functions in a given piece of equipment, calling for custom building. Recognizing that fact, Collins engineers have designed the standard audio line in such a way that the standard sub-assemblies can be adapted in any wanted variety to provide custom equipment for special individual requirements, and at a surprisingly low increase in cost.

The highly skilled engineering group responsible for Collins custom work has had years of experience in broadcasting, and is capable of building anything which may be required by the broadcaster. Collins also has all facilities for factory wiring and testing and, if desired, will be glad to cooperate with your Chief Engineer in supervising installation.

A functional block diagram of the equipment facilities required and a rough physical layout, together with information regarding any special circuit or construction features desired, should accompany your inquiry.

6P-1 PREAMPLIFIER

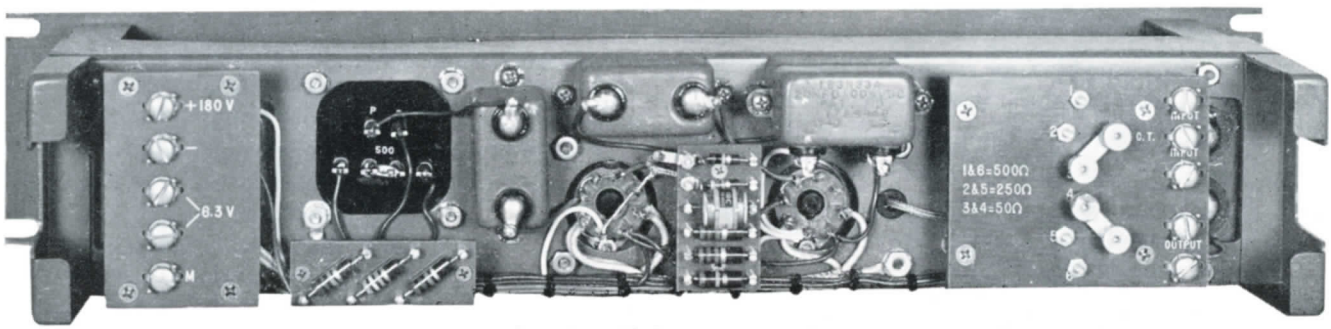
The Collins 6P is a high fidelity Preamplifier designed for service in AM, FM and TV applications. It operates from a low-level microphone or similar source and has sufficient output to drive a program amplifier, or audition facilities. As many as five of these preamplifiers, which require an external power supply, can be powered from the Collins 409T-3 Power Supply.

The 6P uses standard tubes and has two stages of amplification. It is carefully engineered for high performance through the use of the latest circuit refinements and improved components. Generous safety factors throughout insure operating reliability. The hum and noise levels are low, and the output is clean and brilliant. The frequency response is flat from 30-15,000 cps, with a variation of only ±1.0 db. Distortion at normal program level is less than 1.0%. Adequate shielding and careful circuit arrangement prevent cross-modulation between preamplifiers when more than one are used, even when they are placed side by side. Two gain positions are provided, giving approximately 45 db or 35 db amplification respectively. Gain is constant for a given setting.

The advanced design of the 6P provides easy accessibility to all parts. An access door in the panel permits tube changing from the front. Removal of the slip-on dust cover gives immediate access to all circuit components.

Input Impedance: 30/50, 200/250, or 500/600 ohms.
Output Impedance: 600 ohms (150 ohms available).
Input Level: Commercial microphone level.
Output Level: –35 to –15 dbm*.
Overall Gain: 45 db in high position, 35 db in low position.
Frequency Response: 30-15,000 cps ±1.0 db.
Noise Level: –65 db from program level.
Distortion: Less than 1.0% at program level.
Tube Complement: 2-1620 or 2-6J7.
Power Requirements: 6.3 volts a-c @ 0.6 amperes, 180 volts d-c @ 6 ma. Use Collins 409T-1 or 409T-3 power supplies.
Mounting: Standard 19″ rack.
Mounting Dimensions: 19″ w, 3½″ h, 7½″ d.
Finish: Metallic gray.
Weight: 11 lbs.

**1 milliwatt, 600 ohm base.*



Rear view with dust cover removed

6R-2 ISOLATION AMPLIFIER

The 6R-2 is a two-stage push-pull Amplifier. The gain control has 20 steps of 2 db each, and is located immediately behind the access door. Tubes are easily accessible through a door in the front panel. Other components are easily reached by removing the dust cover, which is held in place by spring fasteners. Provisions have been made for external metering of the tube currents.

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.
Gain Control: Step by step with detent, 2 db per step.
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.
Tube Complement: 2—6SN7.
Power Requirements: 6.3 volts @ 0.6 amp. a-c or d-c. 100 to 250 volts d-c at 20 ma. Power may be obtained from the Collins 409T-1 or 409T-3 power supplies.
Dimensions: 19" w, 3½" h, 8⅛" d.
Finish: Metallic gray.
Weight: 10½ lbs.

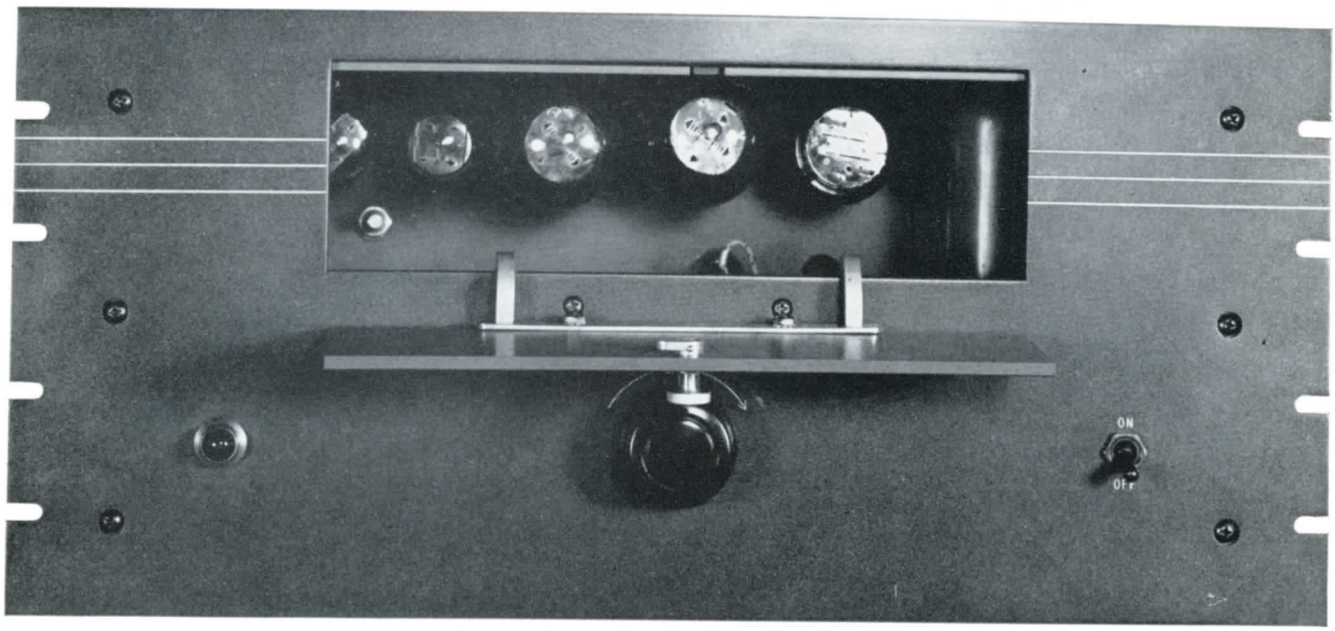
**dbm, 1 mw into 600 ohms.*

6T MONITOR AMPLIFIER

The 6T is a 2-watt Monitor Amplifier having a self-contained power supply. The power switch, pilot light and volume control are mounted on the front panel. Tubes are accessible from the rear.

Input Impedance: 600 ohms matching, or 20,000 bridging.
Output Impedance: 600, 150, 16, 8 and 4 ohms.
Frequency Response: 30-15,000 cps +2 db.
Gain: 55 db. Matching 600 ohms.
45 db. Bridging with 20,000 ohms.
Distortion: Less than 3%.
Noise: –65 db.
Output Level: +33 dbm*.
Maximum Input Level: +10 dbm*.
Tubes: 2-12AU7, 2-6AQ5, 2-6X4.
Finish: Metallic gray.
Mounting Dimensions: 5¼" h, 19" w, 6½" d.
Power Requirements: 115 volts a-c, 50/60 cps.
Weight: Approx. 15 lbs.

**dbm, 1 mw into 600 ohms.*



6X-2 MONITOR AMPLIFIER

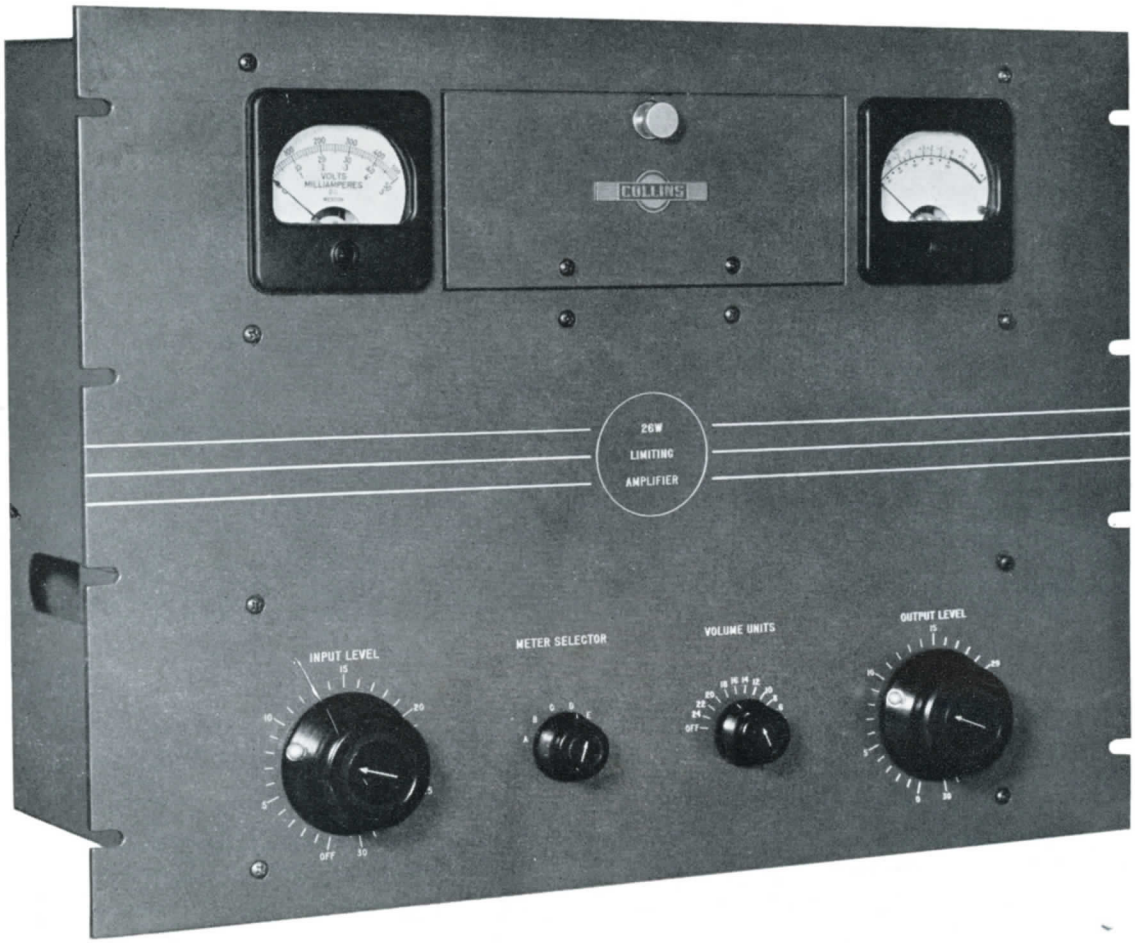
The Collins 6X-2 is a reliable 10-watt Monitor Amplifier complete with self-contained power supply. Its high fidelity, typical of all Collins speech equipment, commends its use for AM, FM and TV broadcasting and in the most exacting professional recording work.

All tubes are easily reached through the door in the front of the unit. Other components are made available by removal of the slip-on dust cover.

Because of its excellent electrical characteristics, its 10 watts of audio power and its built-in power supply, the 6X-2 is also an unsurpassed amplifier to follow a good AM-FM tuner and to be followed by a high fidelity speaker, for custom installation in schools, clubs, homes and other applications calling for the finest radio reception.

SPECIFICATIONS

Number of Channels: One.
Input Impedance: 600 ohms matching, 20,000 ohms bridging (150 ohms available).
Output Impedance: 600 ohms, balanced.
Output Level: +40 dbm (10 watts, 12 watts max.).
Overall Gain: 55 db maximum.
Frequency Response: 30 to 15,000 cps ±1.5 db.
Noise Level: Better than 70 db below output level.
Distortion: Less than 2% from 50 to 15,000 cps, 10 watts output.
Tubes: 1-6SN7, 1-6SL7, 2-6L6G's, 1-5V4G.
Power Source: 115 volts a-c, 50/60 cps.
Mounting Dimensions: 8¾″ h, 19″ w, 10¼″ d.
Weight: 34 lbs., 10 oz.
Finish: Metallic gray.



26W-1 LIMITING AMPLIFIER

The 26W-1 Limiting Amplifier is recommended for use in any AM or FM installation where it is desired to control the amplitude of audio frequency peaks. In AM transmitter applications, it limits loud audio passages, thus preventing overmodulation and the accompanying distortion and adjacent channel interference. This limiting action permits a higher average modulation level and, consequently, a stronger transmitted signal.

In FM applications the 26W-1 Limiter is necessary to prevent excessive transmitter swing, which in general produces distortion at the receiver due to the inability of the average discriminator to handle frequency swings greater than 150 kc. In FM systems the use of wide range reproducer systems makes such distortion extremely noticeable.

The 26W-1 performs with equal satisfaction in recording equipment and high quality P.A. systems. It regulates the audio level and prevents overloading the cutting head or speaker, and by raising the average audio level it improves signal-to-noise ratio.

The 26W-1 meets the three most important requirements of a superior product — (1) performance to comply with the specifications prescribed by the application, (2) reliability of operation, and (3) accessibility for maintenance. Thorough consideration was given the resistance-capacitance circuits and transformers to produce a true high fidelity frequency response. Distortion and noise are extremely low. Input and output levels are adjustable.

Two high quality meters provide a continuous visual indication of operating conditions. Individual tube operation, supply voltage, the amount of compression in db, and the output in VU are metered. The limiter stage can be adjusted easily from the front to precise balance, which makes it a simple

job to hold the distortion to a very low level.

A door in the front panel provides access to all tubes. The dust cover is fastened by snap fasteners, and requires no tools for removal. The inside-out chassis construction reaches a new standard for accessibility of components; all resistors and circuit capacitors are on the rear of the chassis and are outermost upon removal of the dust cover.

The very best components, conservatively operated, are employed in the 26W-1. Electrolytic capacitors appear only where specified performance cannot be obtained with paper capacitors and are limited to cathode circuits with less than 50 volts potential. Transformers are sealed, and all insulating materials are the best available.

Frequency Range: 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*.
Gain Controls: Input and output levels adjustable in 30 steps of 1 db.
Overall Gain: 47 db max.
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.
Distortion: Harmonic distortion below 1% rms at any frequency from 100 to 15,000 cycles with no compression. 50-cycle distortion below 1.5% under same conditions. Harmonic distortion below 2% from 100 to 15,000 cycles at any value of compression up to 10 db.
Hum and Noise: –63 db below output level.
Controls: Input and output attenuators, VU range switch, and meter selector switch.
Metering Circuits: Individual tube currents, plate voltage, compression level, and output level.
Tube Complement: 3-6N7, 1-6H6, 2-1621 (2-6F6 may be used), 1-5V4G.
Power Source: 115 volts a-c, 50/60 cps.
Dimensions: 14″ h, 19″ w, 9″ d, for rack mounting.
Weight: 45 lbs. (55 lbs. shipping weight).
Finish: Metallic gray panel.

**dbm, 1 mw into 600 ohms.*