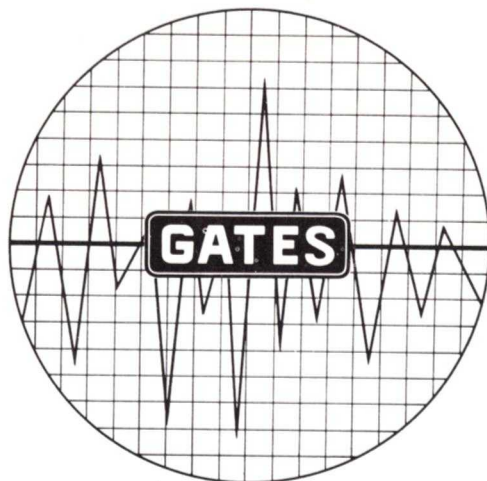




AUDIO EQUIPMENT AND ACCESSORIES

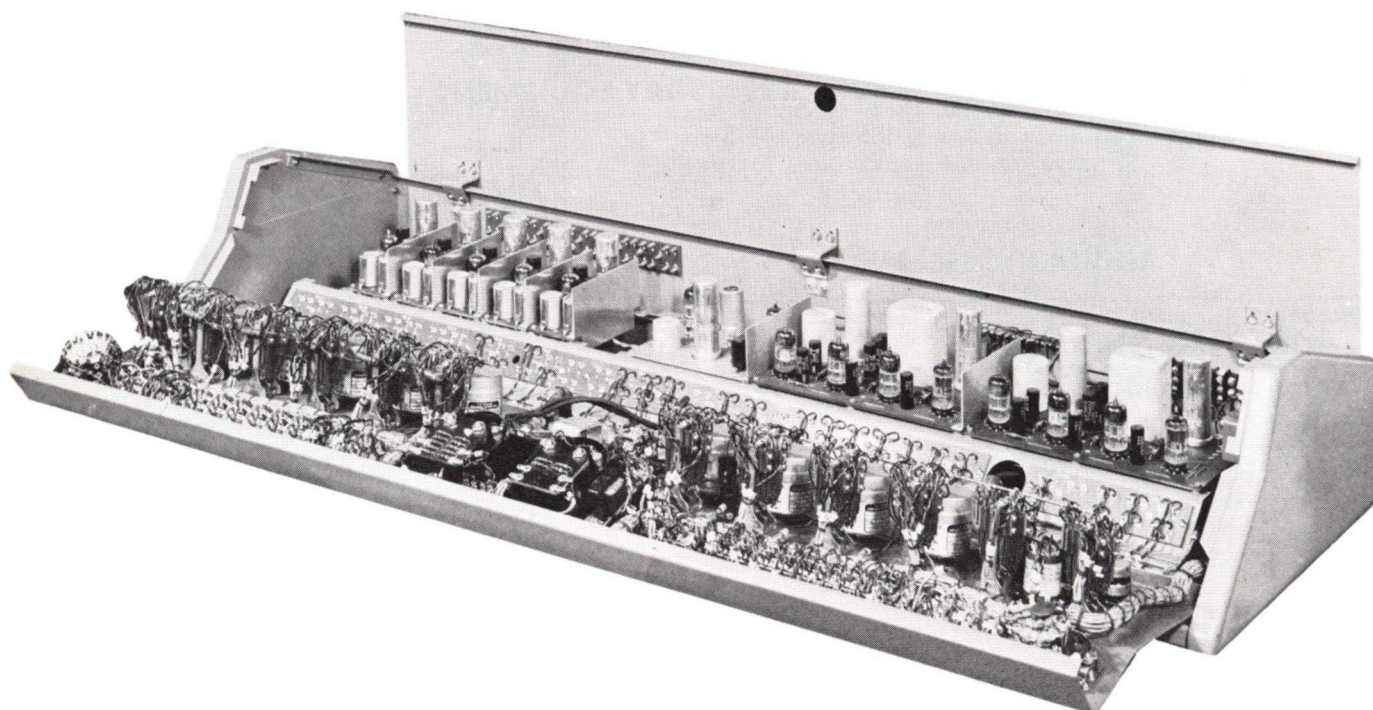
PAGES

110-128	AUDIO CONSOLES
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154-188	AUDIO ACCESSORY EQUIPMENT

DUALUX DUAL SPEECH INPUT EQUIPMENT



Evidence of "Dualux" acceptance is its wide usage in major market stations and by nearly a score of the country's major recording studios. Outstanding features of the Dualux include (1) Selective monitoring of all major circuits. (2) Eight utility keys for expansion. Six are at the left and two to the right. (3) A three-position high-pass filter for quick program correction. (4) Telephone type keys on all mixing channels for increased flexibility. (5) Five preamplifiers wired for 7 microphones. Up to 22 microphones if all utility keys are used. Space for 2 more preamplifiers provided. (6) Complete inbuilt cue-intercom with front panel listen and talkback. (7) Cue-attenuators on 4 mixing channels used for net, turntables, tapes and remotes. (8) Dual program amplifiers. (9) Fully regulated power supply.



DUALUX DUAL SPEECH INPUT EQUIPMENT

SPECIFICATIONS

MIXING CHANNELS: 9 keys selected to either program amplifier. Includes 5 microphone attenuators and 4 high-level attenuators with cue position used for turntables, tapes, networks.

MICROPHONE INPUTS: As wired, 7 microphones switchable to 5 preamplifiers. However, by use of auxiliary keys, as many as 22 microphones may be accommodated.

TURNTABLE/TAPE/NETWORK INPUTS: 4 turntables switchable into mixing channels 6 and 7. Network plus 4 tape or projector inputs selectable into either channels 8 or 9 by ingenious keying system to permit fading instead of dumping.

AMPLIFIERS: 2 complete high-gain program amplifiers with individual front panel master gain controls are provided for entire dual operation. 5 preamplifiers with provisions for 2 additional preamplifiers for future expansion. Preamplifier, program amplifier, and monitoring amplifier have printed wiring throughout. Monitoring amplifier and regulated power supply mounted on drop down panel for rack mounting. Monitoring amplifier full 10 watt capacity.

IMPEDANCES: Preamplifier input 30/50 and 150/250 ohms balanced or unbalanced. Remote, network, tape and projectors 600/150 ohms balanced or unbalanced. Output impedance 600/150 ohms balanced to both program amplifiers. Monitoring amplifier, 8 and 16 ohms. Intercom amplifier, 600 ohms.

GAIN: Gain overall, 104 db. From turntable, network, or remote input, 61 db. All measurements ± 2 db.

RESPONSE: Overall or any segment of program circuit, ± 1.5 db, 30-15,000 cycles. **MONITORING AMPLIFIER:** ± 2 db, 30 to 15,000 cycles.

OUTPUT LEVELS AND DISTORTION: Program line maximum of +8 dbm at 1% or less. Monitoring amplifier maximum of +40 dbm (equivalent to 10 watts) at 1% or less distortion.

NOISE: Microphone input to program output 60 db or better below +8 dbm output, using -60 dbm input. Turntable, network and remote inputs 70 db or better below +8 dbm output. **MONITORING CIRCUIT:** 60 db below +40 dbm output.

CROSS-TALK: All circuits or segments thereof below noise level with normal levels and control positions.

TUBES: (18) 5879, (4) 12AX7, (2) 12AU7, EL84, (1) OA2, 6AK6, 6080, GZ34.

TOTAL NUMBER OF TUBES: 30.

TOTAL TUBE TYPES: 8.

RELAYS: 3 provided with contacts for muting loudspeakers and turning on warning lights.

SIZE (Dualux): 46 $\frac{1}{2}$ " wide, 7 $\frac{1}{2}$ " high, 15" deep.

TOTAL NET WEIGHT: 101 lbs. Packed weight: 205 lbs.

CUBAGE: 9.7 cubic feet.

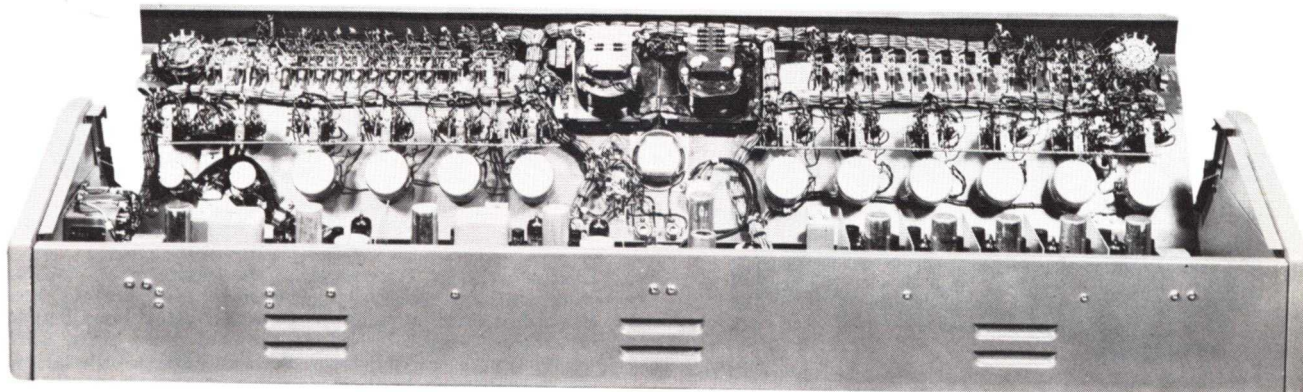
SERVICING: Front panel hinges down to service. Audio amplifier strip hinges up.

POWER CONSUMPTION: 155 watts.

FINISH: Cabinet in medium gloss gray. Front panel metallic with escutcheons in etched black aluminum. Control knobs supplied with kit of color disc inserts for coding.

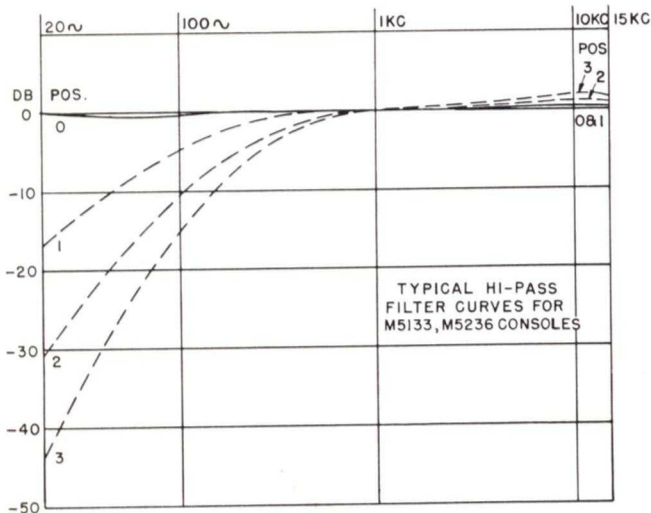
METERING: Two standard 4" illuminated VU meters recessed behind front panel for easy vision at correct eye level. One meter across program line at all times, the second may be switched across either program line; both meters calibrated +8 dbm output (may be altered for higher or lower levels on request).

PATCH PANEL: All main circuits brought to terminal board and strapped together so that normalizing jacks, standard, and patch panels may be used where desired.



Rear view of Dualux. Note no rear terminations, allowing Dualux to fit against wall where desired.

DUALUX DUAL SPEECH INPUT EQUIPMENT



Graph showing four curves Dualux front panel control equalizer.

REMOTE LINES: 5 switched into channel 9, also into cueing system. Each remote key has cue/talk-back/mix positions. Duplicate line isolation transformers in channels 8 and 9 to handle any unbalanced condition.

EQUALIZER (High-Pass Filter): Direct front panel control for Program Channel A. A flat position and 3 selected response curves allow immediate elimination of hum, rumble or extraneous circuit noise at low frequencies. (See response curves).

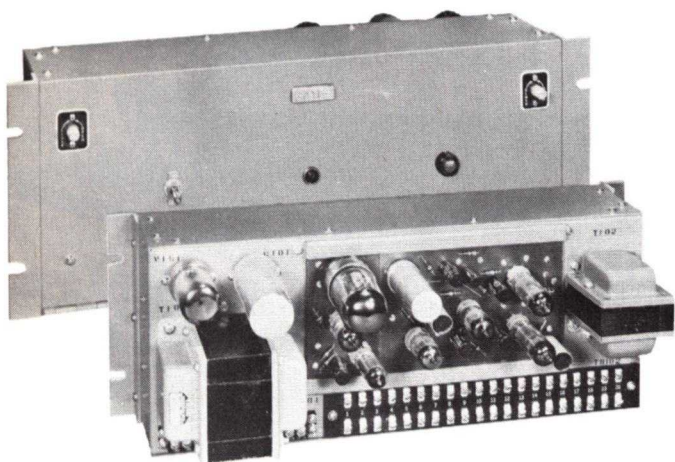
CUE-INTERCOM SYSTEM: Loudspeaker and switching facilities directly in front center of Dualux console. May be used with M-5303 sub-station or any similar equipment for studio talk-back, providing following exclusive features:

- Interlocked and cannot interfere with programming.

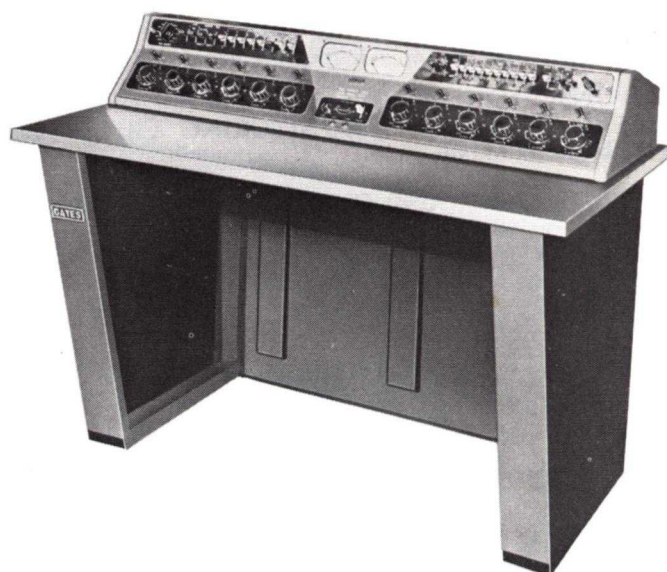
- 8 external intercom circuits selected with front panel switch.
- 8 cueing circuits selected with front panel switch.
- High gain amplifier provides adequate level for monitoring all intercom circuits.
- All inputs and outputs padded, plus isolation networks where necessary, to allow selection of any circuit without adjusting gain control where levels within 20 db of normal.
- Front panel phone jack will cut cue speaker when phone plug inserted.
- Intercom speaker mutes when announcing from control room.
- Intercom system will listen and talk back on following circuits:

RMT. 1	Turntable Cue*
RMT. 2	Studio A
RMT. 3	Studio B
RMT. 4	Studio C
RMT. 5	Mixer Bus A*
	Mixer Bus B*

* Listen only.



Fully regulated power supply. Relays are powered from main power supply and located inside of drop-panel housing.

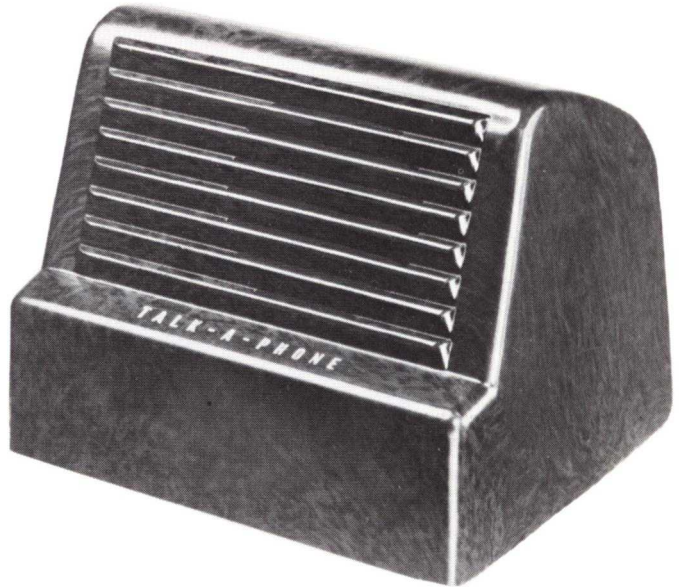


Dualux and desk. Desk designed specifically for the Dualux, with sides and back of 16 gg. stretcher level furniture steel finished in medium gray. Top is of formed linen formica in charcoal gray attached to seasoned 5-ply birch. Three wiring troughs extend down the inside rear to conceal wiring from console to floor. Leveling screws are on all four corners. Size: 47" wide, 30" front to back, height 29" adjustable to 30 1/4". Shipped knocked down.

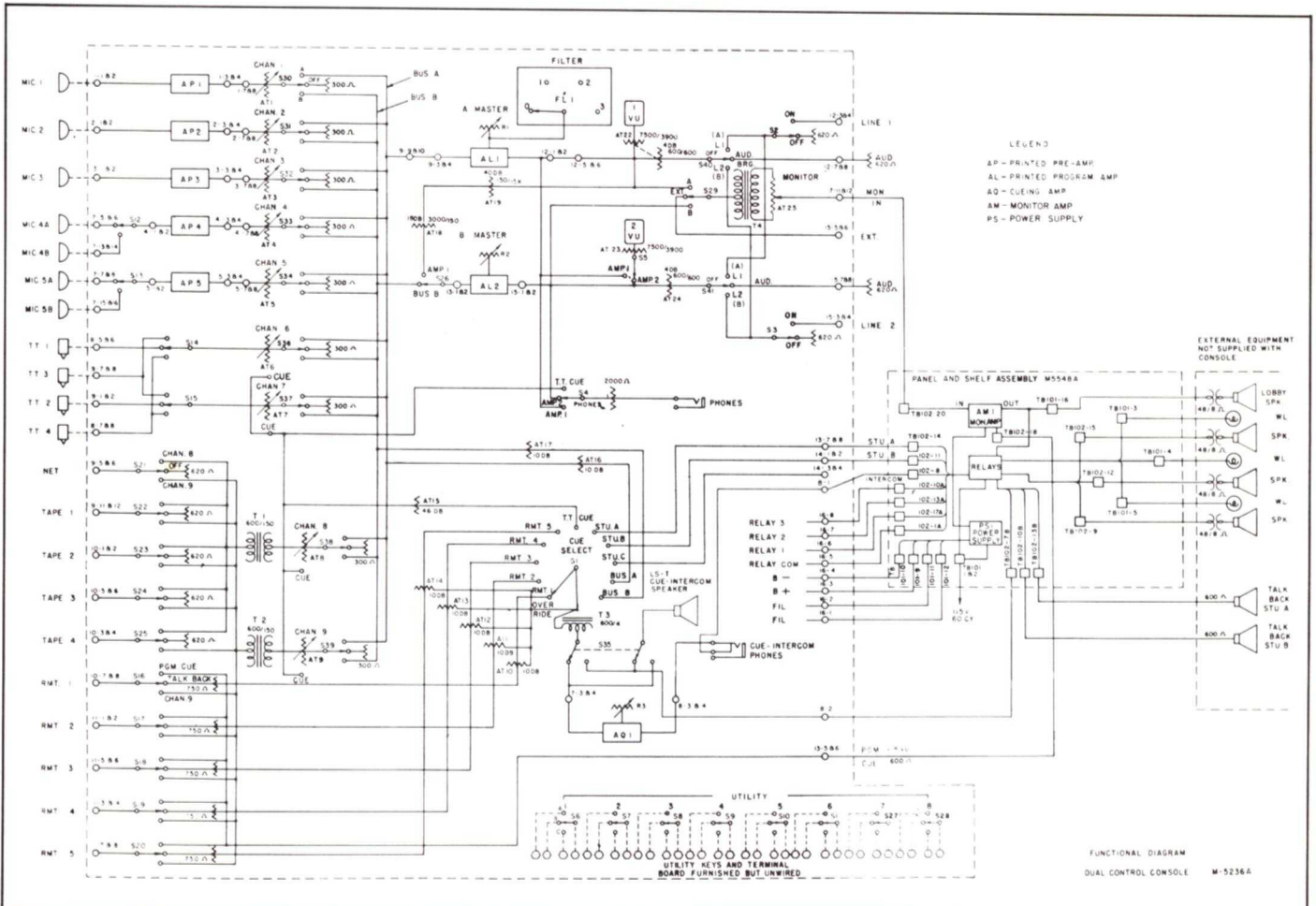
DUALUX DUAL SPEECH INPUT EQUIPMENT

ORDERING INFORMATION

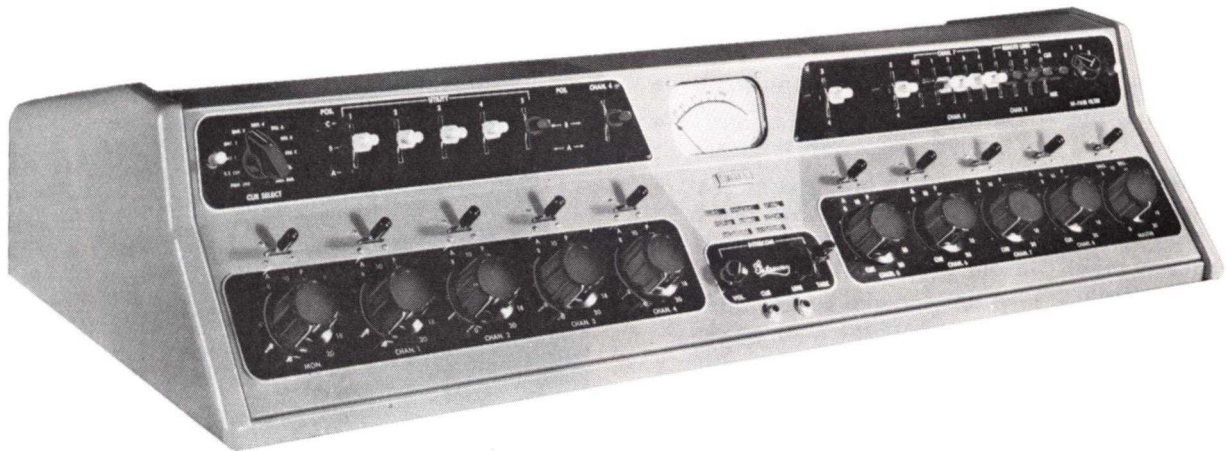
- Dualux speech input console with tubes and ready to install **M-5236A**
- Extra preamplifiers for above **M-5304**
- Extra muting relays for above **AK-11939**
- Intercom sub-station for above **M-5303**
- 100% spare tube complement for above **TK-294**



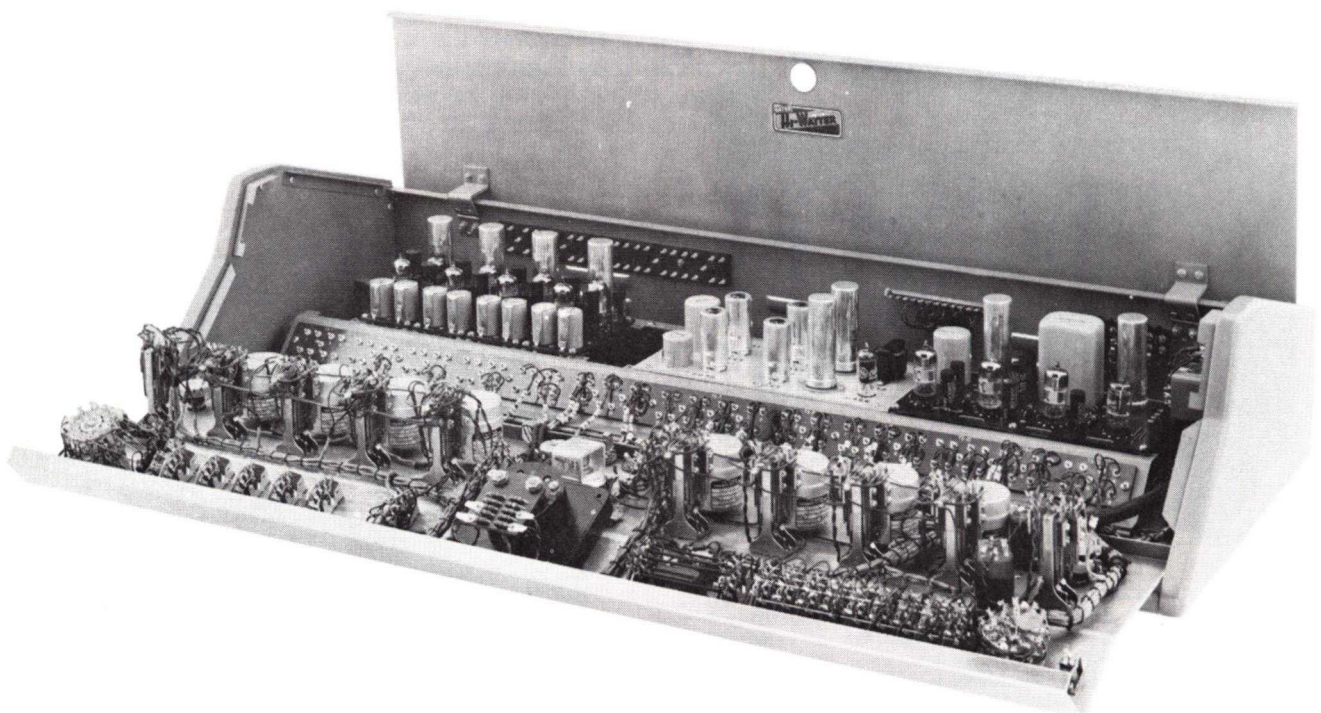
M-5303 sub-station for studio intercom to talk back to control board. Includes matching transformer.



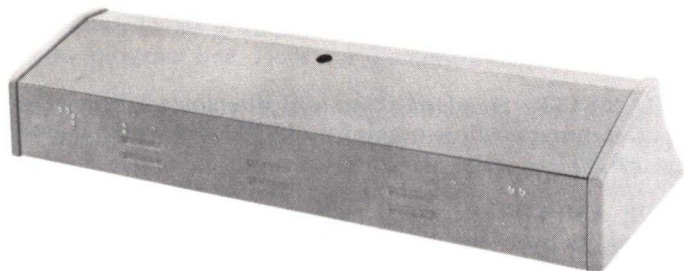
GATESWAY 8-CHANNEL SPEECH INPUT SYSTEM



The Gatesway is one of the most comprehensive audio systems manufactured today. Eight step type mixing channels accommodate five microphones into four preamplifiers (15 microphones by use of utility keys), four turntables, four tapes, network, and multiple remote lines. The Gatesway includes the exclusive 10 watt ultra linear amplifier, variable high-pass filter, inbuilt cue-intercom, and five unwired utility keys for individual needs. Twenty-seven keys accommodate 52 switching functions for almost any conceivable broadcast use. Relays are powered from the fully regulated power supply and located inside of drop-panel housing. The monitoring amplifier is also on this panel.



GATESWAY 8-CHANNEL SPEECH INPUT SYSTEM



Rear view illustrates how console may be set against wall, as all terminations are made on inside for both electrical and mechanical protection.

SPECIFICATIONS

MIXING CHANNELS: 8 ladder type. Ninth mixing channel may be added in place of monitor gain control which is moved to chassis of monitor amplifier.

MIXER KEYS: Selects each mixing control into: (a) program amplifier, (b) monitor/emergency amplifier, (c) cue amplifier/speaker. Also provides speaker/warning light control through relays included.

TURNTABLE INPUTS: 4, key selected into mixing channels 5 and 6. Connects turntables, through mixer, to: (a) program amplifier, (b) monitor amplifier, (c) cue/speaker amplifier.

TAPE INPUTS: 4, key selected into mixing channels 7 and 8. Connects tapes, through mixer, to: (a) program amplifier, (b) monitor amplifier, (c) cue/speaker amplifier.

NET INPUT: 1 key for network of any 600 ohm line into mixing channels 5 or 6, to: (a) program amplifier, (b) monitor amplifier, (c) cue/speaker amplifier.

MICROPHONE INPUTS: As wired, accommodates 5 into 4 preamplifiers. Additional mike input may be had by using utility key 5 into mixing channel 3.

NUMBER OF PREAMPLIFIERS: 4, with provision for 2 additional preamplifiers for future expansion.

IMPEDANCES:

Mic inputs	30/50 and 150/250 ohms.
TT inputs	150-250 ohms.
Tape inputs	500/600 ohms.
Net input	600 ohms.*
Rmt inputs	600 ohms.*
Ext. input (monitor)	600 ohms.
Pro. amp. output	600 ohms.
Mon. amp. output	8 and 16 ohms.
Loudspeakers	matching to 8/16 ohms.**
Headphones	5000 ohms or higher.
Ext. cue speaker	600 ohms.

*May be adjusted to other NAB standards such as 50/150/250 by tapped primary on isolation transformer.

**Speakers in parallel circuit. Example: 2 speakers 32 ohms, 3 speakers 48 ohms, etc., by use of speaker matching transformer on speaker.

GAIN: From mic input to program line output, 104 db. From remote line, net, tape and turntables to program line output, 61 db.

NOTE: All gains stated ± 2 db.

RESPONSE: ± 1.5 db 30-15,000 cycles (standard mode of operation). ± 2.0 db 30-15,000 cycles (emergency circuits).

DISTORTION: 1% or less 30-15,000 cycles all program circuits measured at +8 dbm output. 1% or less 50-15,000 cycles all monitoring circuits measured at +40 dbm (10 watts).

NOISE: Program circuit . . . 60 db or better below +8 dbm measured at -60 dbm input. Monitoring amplifier . . . 60 db below +40 dbm output.

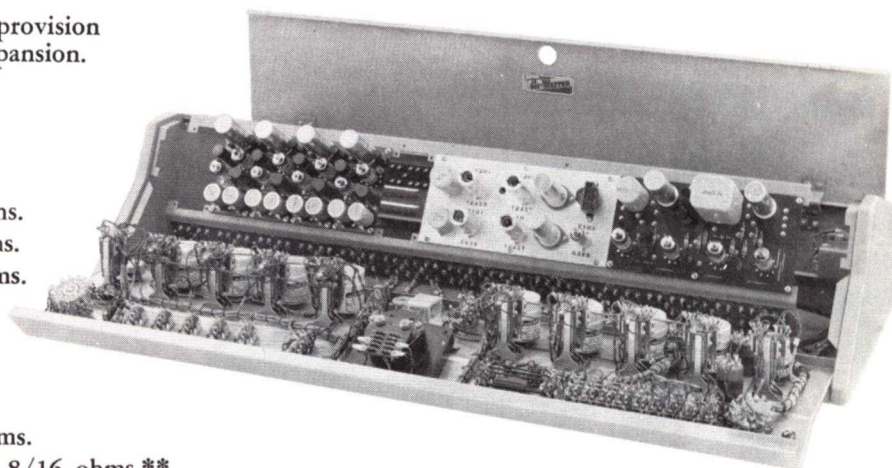
CROSS-TALK: Below microphone channel noise level within normal inputs and control position.

TUBES: Preamplifiers . . . two 5879, total 8. Program Amplifier . . . three 5879, one 12AU7. Booster Amplifier . . . one 12AX7. Cue Amplifier . . . one 5879, one 12AX7, one 6AK6. Monitor Amplifier . . . two 12AX7, two EL84. Power Supply . . . one GZ34, one 6080, one 5879, one OA2. Total Tubes: (13) 5879, (4) 12AX7, (2) EL84, (1) 12AU7, 6AK6, 6080, GZ34, OA2.

TOTAL NUMBER OF TUBES: 24.

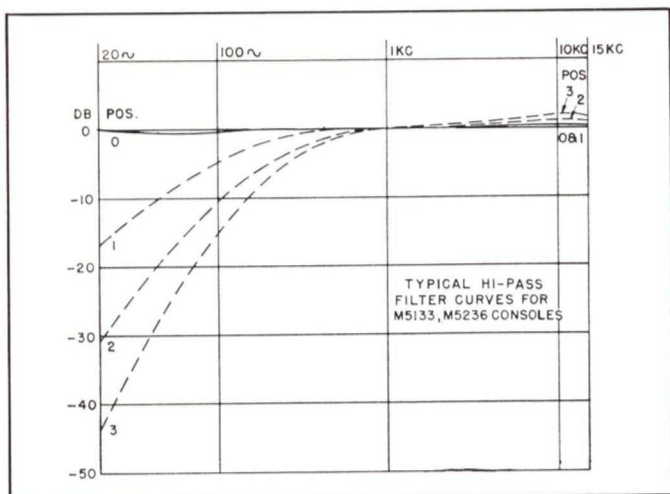
TOTAL TUBE TYPES: 8.

RELAYS: 3 provided telephone type with contacts for muting loudspeakers and breaks 115 volt circuit for warn-



Adding to serviceability, the entire amplifier framework hinges up. In this way, every under chassis connection may be instantly reached. Easily kept clean, too.

GATESWAY 8-CHANNEL SPEECH INPUT SYSTEM



Curve of hi-pass filter. Three degrees of low frequency cutoff may be inserted without clicks or loss of gain. This feature is indispensable for booming microphones, moving sets or hum from remote lines.

lettering. Control knobs supplied with kit of color disc inserts for coding.

VU METER: Standard 4" scale B illuminated. Reads output of program line, peaking to 0 VU when output level is +8 VU.

CUE AMPLIFIER: Fixed pads at all circuits provide adjusted uniform input level to proper cue speaker level. Also provides proper level to operate directly remote cue intercom speaker at room level.

REMOTE LINES: 4, key selected into mixing channels 7 and 8. Key up — feeds program cue to remote line. Key center — feeds cue/speaker amplifier to remote line for both talking and listening. Key down — remote line on air.

CUE SPEAKER/AMPLIFIER SELECTOR: Selects cue speaker/amplifier for both talk and listen into: all remote lines, 3 studios and utility line. Selects to listen only on turntables, tape recorders, audition buss and program line.

UTILITY KEYS: 5 provided, unwired, located to left upper center of VU meter. Provided for specific requirements of individual installation such as additional remote lines, tape inputs, etc.

OUTPUT EMERGENCY KEY: Located above master gain. In case of failure of program amplifier, the output

ing lights up to 60 watts per light. Room for 2 added relays on chassis where unusual muting or control requirements exist. Relays operate from console power supply.

SIZE: 39" wide, 15" front to back, 71½" high. Height (lid up), 121½".

WEIGHT: Net, Console, 52 lbs. Power Supply and monitoring unit, 39 lbs. Total packed weight, 175 lbs.

CUBAGE: 8.5 cubic feet.

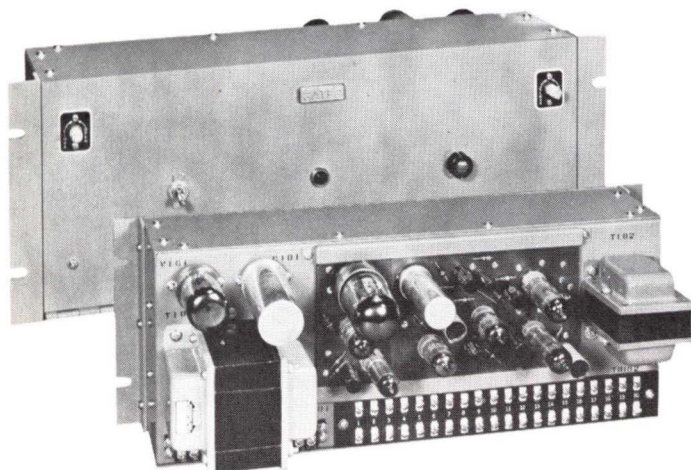
PRIMARY POWER: 115 volts, 50/60 cycles, approximately 105 watts.

POWER CONSUMPTION: 115 watts.

FINISH: Cabinet in medium gloss gray. Front panel metallic with escutcheons in etched black and aluminum



Desk designed for Gatesway console. Sides and back of 16 gg. stretcher level furniture steel finished in medium gray. Top is of formed linen formica in charcoal gray attached to seasoned 5-ply birch. Three wiring troughs extend down the inside rear to conceal wiring from console to floor. Leveling screws are on all four corners. Size: 39½" wide, 30" front to back, height 29" adjustable to 30¾". Shipped knocked down.



Power supply and monitoring unit; drop-panel housing.

GATESWAY 8-CHANNEL SPEECH INPUT SYSTEM

of the monitoring amplifier may be instantly connected to the program line. Does not disconnect loudspeakers.

MONITOR INPUT KEY: Located above monitor gain control. Allows switching of monitoring amplifier to: (a) padded output of program amplifier, (b) audition buss, and (c) external pair for any other input.

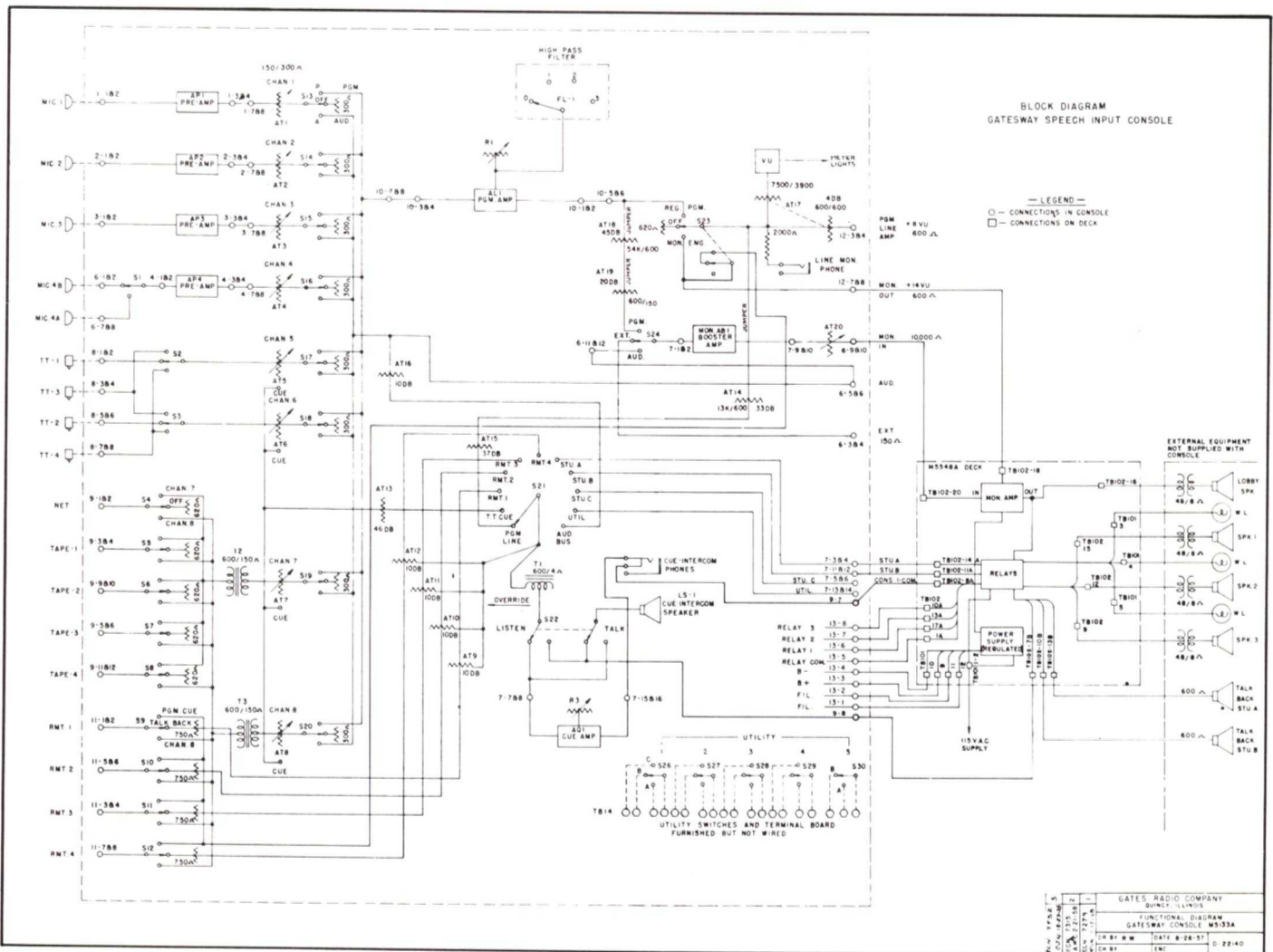
PATCH PANEL TAKE-OFF: Jumpers provided for patch panel interlock at output of all preamplifiers and input and output of both program and monitoring amplifiers.

ORDERING INFORMATION

- Gatesway speech input console with tubes and ready to install **M-5133A**
 Extra preamplifiers for above **M-5304**
 Extra muting relays for above **AK-11939**
 Intercom sub-station for above **M-5303**
 100% spare tube complement for above **TK-290**



M-5303 sub-station for use with self-contained Gatesway cue-intercom amplifier. Includes matching transformer. Intercom is automatically muted when live microphones adjoin.



YARD 8-CHANNEL SPEECH INPUT SYSTEM

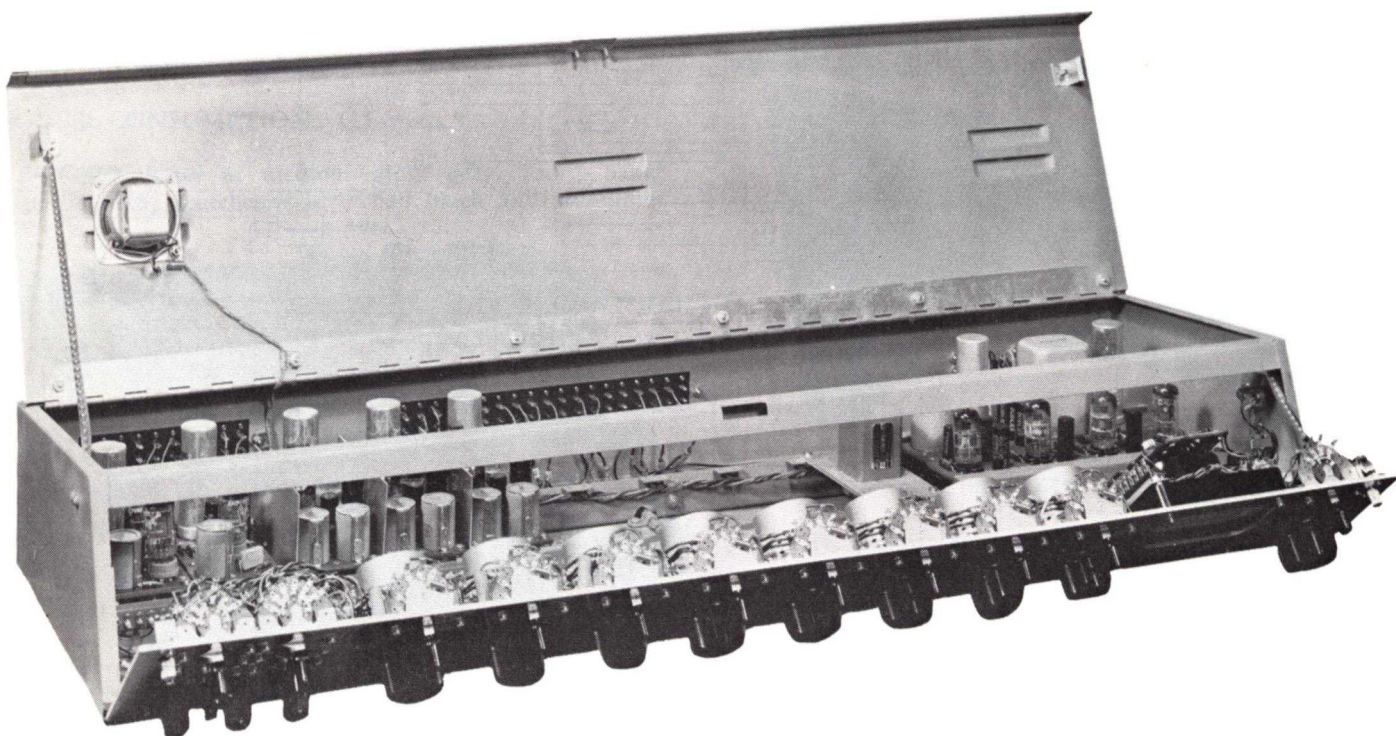


Adaptable to either radio or television studio control, the Gates Yard is compact, designed with extra facilities to meet all station requirements, and styled for the modern broadcaster.

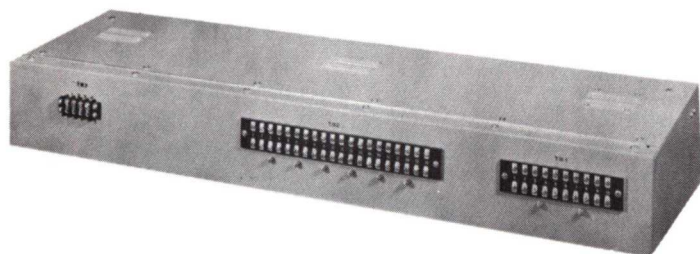
On all standard Yard consoles, there are 3 preamplifiers with input switching for 6 microphones, and with space provided for 5 additional preamplifiers. This means it is possible to have a maximum of 11 microphone inputs, offering flexibility for every type of station.

Other outstanding features include: 8 mixing channels key

selected into the program or monitoring bus accommodating many combinations of microphones, turntables, tape playbacks and projectors with provision for network and remote lines; a self-contained cue amplifier and speaker for turntable and projector channels; an ultra-linear 10 watt monitoring amplifier; and a regulated power supply for uniformity of performance. The broadcaster will also appreciate the low, compact silhouette for good over-the-top vision; dual muting relays with space for 3 more where needed; step-type attenuators for all mixing channels; and low impedance mixing throughout. Servicing of the Yard is extremely simple.



YARD 8-CHANNEL SPEECH INPUT SYSTEM



Rear view of Yard shows simplicity of detail. Wiring is to numbered screw terminals.

SPECIFICATIONS

MIXING CHANNELS: Eight channels are each key selected into the program or monitoring amplifier bus. Controls are the step type low impedance having 20 steps of 2 db. Channels 6 and 7 have cue connection at infinity (off). This cue feeds the output from Channel 6 or 7 to cueing amplifier/speaker as employed for turntable cue up. Muting relays operate in conjunction with these keys and are wired to the first three channels. Sufficient contacts are on all channel keys for additional relay muting. Audition bus is connected to terminals for recording as well as switch selectable to the monitoring amplifier.

PREAMPLIFIERS: Three are provided as standard. Room is available for five more. Each of the three preamplifiers has an input key to select between two microphones for each preamplifier, giving a six microphone capacity. Muting relays may be connected in any usable combination with both input and mixing channel keys. Additional M-5304 preamplifiers require only installation and connection to the available filament and plate supply in the console. When using the maximum of eight preamplifiers, the total microphone capacity is eleven.

IMPEDANCES: Microphone input to preamplifiers, 30/50—150/250 ohms.
Turntable, projector, tape input to mixer, 150/250 ohms.
Remote line, network input to mixer, 150/250—500/600 ohms.
Program line output, 500/600 ohms.
Monitoring amplifier output, 8 or 16 ohms.

GAIN: (a) Any preamplifier input to program line output: 103 db.
(b) Any preamplifier input to monitoring amplifier output: 130 db.
(c) Any turntable, tape, projector or network input to program line output: 60 db.
(d) Any turntable, tape, projector or network input to monitoring amplifier output: 87 db.

NOTE: Gain of monitoring amplifier is reduced by fixed pad when operating from output of program amplifier. All gain measurements stated are ± 2 db.

RESPONSE: Program circuits $\pm 1\frac{1}{2}$ db, 30-15,000 cycles.
Monitor circuits ± 2 db, 30-15,000 cycles.

OUTPUT LEVELS AND DISTORTION: Program line of 8 dbm at 1% or less distortion. Monitoring amplifier maximum of +40 dbm (equivalent to 10 watts) at 1% or less distortion.

NOISE: Program circuit including preamplifier 60 db or better below +8 dbm output with -60 dbm input.
Equivalent noise input is -120 dbm.
Monitor circuit 62 db below +40 dbm output.

TUBES: Preamplifiers each (2) 5879.
Program amplifiers (3) 5879 and (1) 12AU7.
Cueing amplifier (1) 12AX7 and (1) 6AK6.
Monitor booster amplifier (1) 12AX7.
Monitoring amplifier (2) 12AX7 and (2) EL84.
Power supply, one each OA2, 5879, 6080, 5V4 (GZ34).

TOTAL TUBES: (standard model with 3 preamplifiers) 21.

TOTAL TUBE TYPES: 8.

RELAYS: Provision is made for five relays. Two relays are supplied as standard. These mount behind the drop-down panel of the power supply/monitor unit. Contacts are provided for both speaker muting and warning lights. Muting relays are high quality telephone type and operate from control keys on console in a wide variety of circuit combinations to suit the purchaser's desires.



Want to add another microphone channel? There is room for five more M-5304 printed wiring 2-stage preamplifiers. Add as you wish, or a TV station might wish all eight at once.

YARD 8-CHANNEL SPEECH INPUT SYSTEM

- SIZE:** — Console, 36" wide, 53¼" high, 12½" deep.
 — Power/monitoring/muting unit, 19" wide, 7" high, 8" deep. Front panel drops down to service.
 — Optional desk, 30" high, 36" wide, 25½" deep with desk (front to console) depth 12".

WEIGHT: Net weight 77 lbs. Packed weight 90 lbs.

CUBAGE: 7.1 cubic feet.

SERVICING: All printed circuit amplifiers are the same depth and mount on a channel strip extending the full width of the console. The front panel hinges out to reach all controls and switches instantly. Cabinet lid hinges up for reaching every part, tube and termination.

POWER: 115 volts, 50/60 cycles.

POWER CONSUMPTION: 130 watts.

TERMINATIONS are to numbered terminal boards and installation is simplified by easy accessibility to all terminals.

FINISH: Cabinet medium gloss gray. Panel anodized aluminum in natural and black. Knobs furnished with color decal kit. Desk, medium gloss gray to match cabinet of Yard.

VU METER is a standard 4" illuminated, flush mounted meter and operates at all times in the program line circuit.

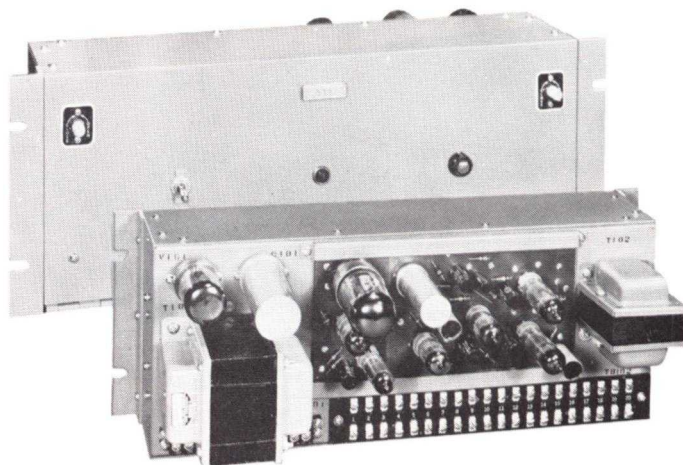
CUE-AMPLIFIER/SPEAKER is inbuilt and has its own control at the extreme panel left. Speaker is mounted in the console lid. Output from remote lines and mixing channels 6 and 7 are switchable to the cueing amplifier. The "Yard" is the only console in its price range with an inbuilt 100% cueing system.

MONITORING AMPLIFIER: In today's modern broadcasting, loudspeaker distribution is increasingly important. Standard "Yard" equipment includes an ultra linear 10 watt, 1% distortion amplifier. The popular EL84 tubes are utilized in the push-pull output circuit.

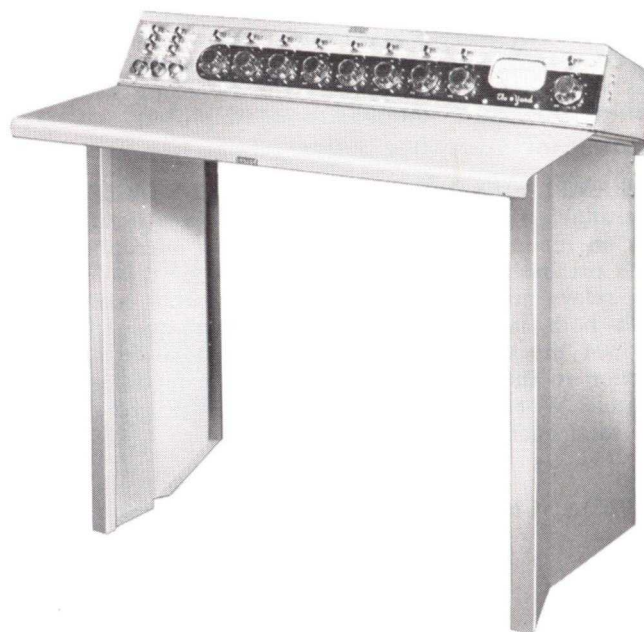
MONITOR BOOSTER: This added "Yard" exclusive provides a separate voltage amplifier to bring the monitor-audition bus level to equal the program bus level. This makes it possible to switch from program to monitor with no change in level. The output of this amplifier is connected to a pair of terminals for recording direct from any mixing channel. The monitoring amplifier, power supply and muting relay unit are in a separate unit as illustrated.

PROGRAM AMPLIFIER has four stages and an abundance of gain for wide control. Both input and output are low impedance. No high impedance circuits are used at any place in the "Yard."

REMOTE/NET KEYS: Three incoming lines are selected



Monitoring amplifier, regulated power supply and muting relays are a separate husky rack or desk mount unit.



Desk designed specifically for the Yard. 30" high, 36" wide, 25½" deep.

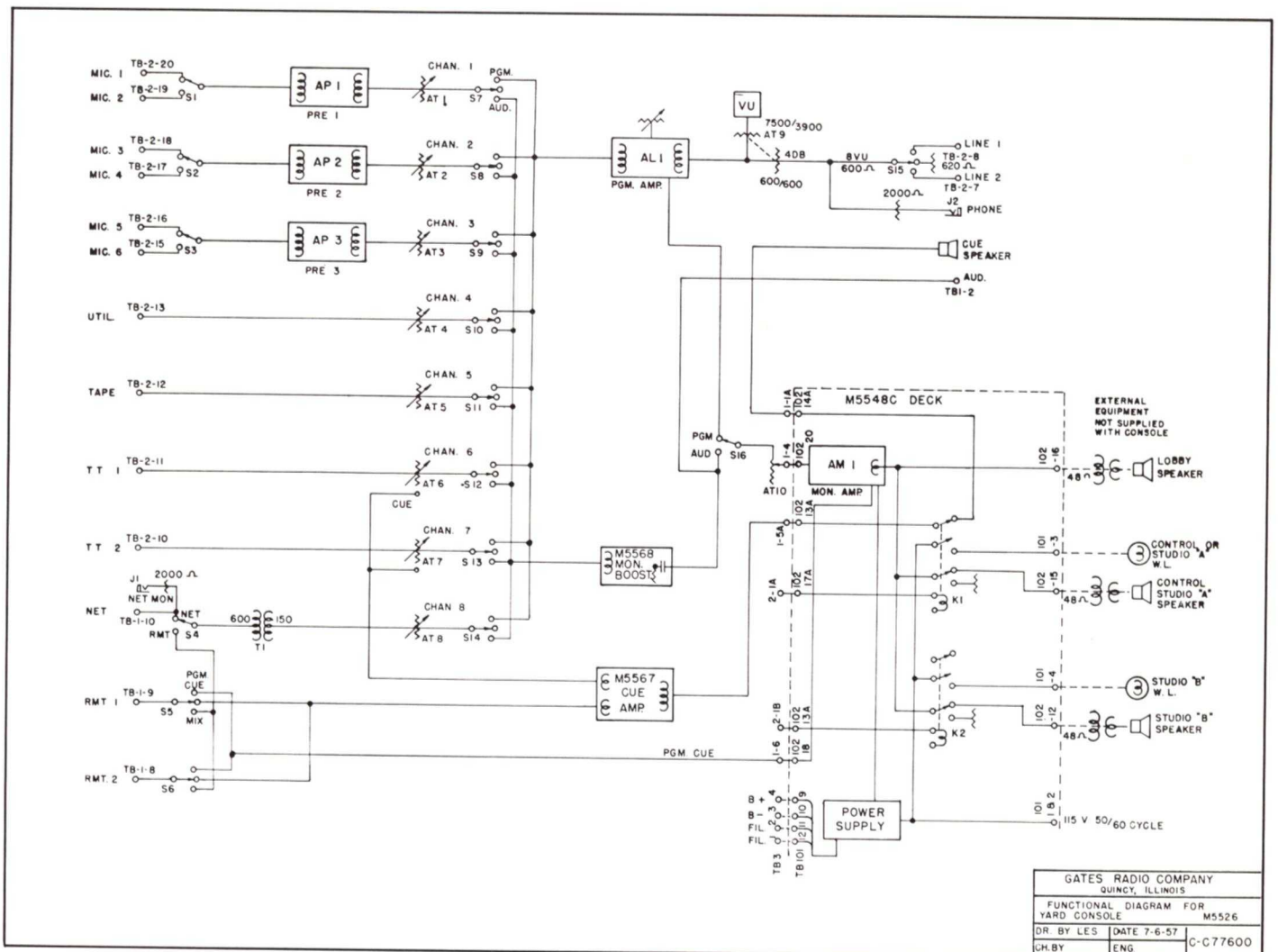
by three keys to the extreme left. These lines feed through a line isolation transformer. The two remote lines are selectable to "Program Cue," "Cueing Amplifier" and "Broadcast." The "Network" key may be used for a remote line where the station is independent.

SPEAKER MATCHING TRANSFORMER: Available as an accessory where several speakers are multiplied to the 16 ohm output. Primary 48 ohms, secondary 8 ohms. Not required where 2 or 3 speakers are the maximum.

YARD 8-CHANNEL SPEECH INPUT SYSTEM

ORDERING INFORMATION

- YARD SPEECH INPUT CONSOLE with tubes and ready to install M-5526
 Extra preamplifiers for above M-5304
 Extra muting relays for above AK-12626
 100% spare tube complement for above TK-282



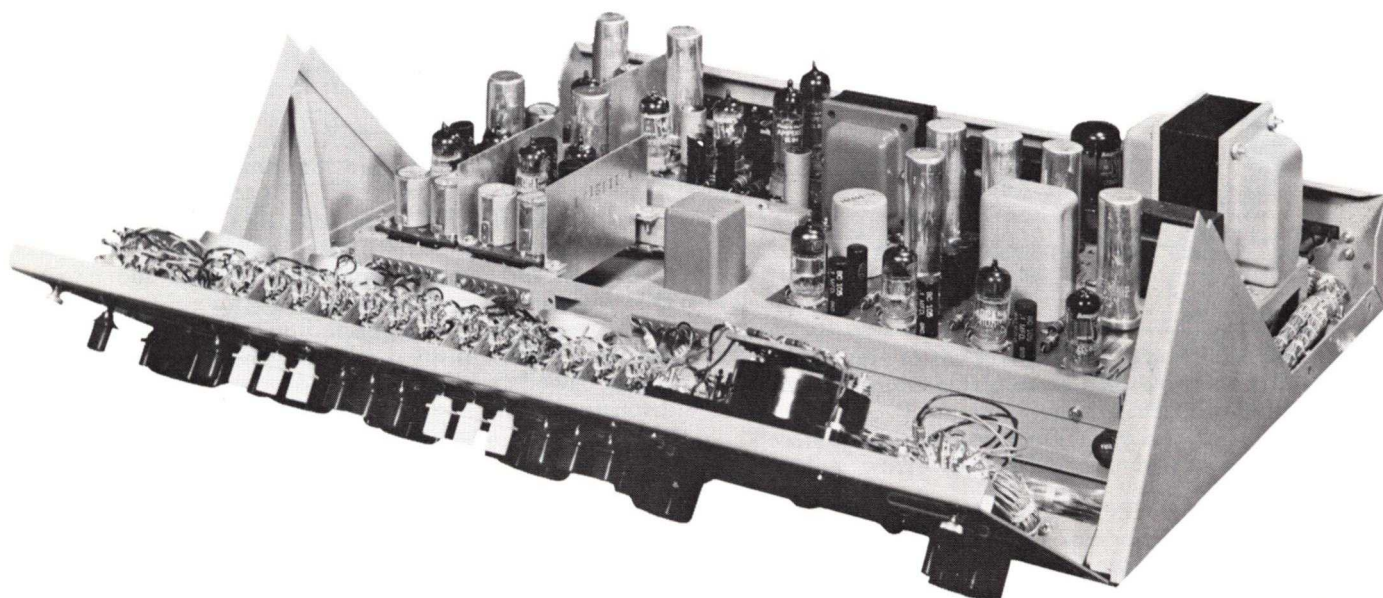
STUDIOETTE 4-CHANNEL SPEECH INPUT CONSOLE



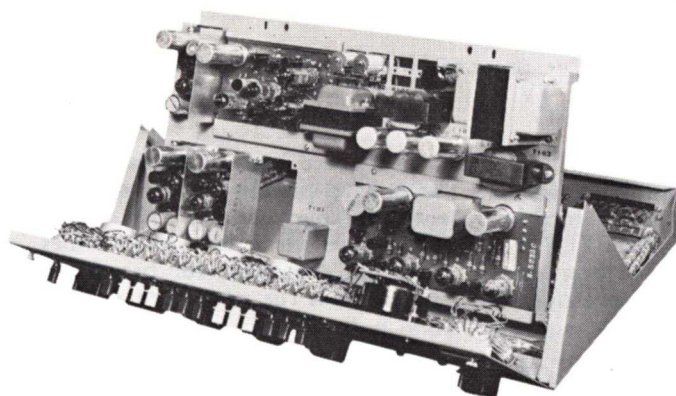
The Gates Studioette is a perfect blending of workhorse versatility and functional design for modern styling. Here, an unusual generosity of controls, new performance standards, service ease and smart commercial appearance are combined with quality engineering and materials to satisfy the most demanding broadcaster.

The Studioette condenses big console facilities into the ease of four mixing channels. Four channel, step type

mixer with generous key switching facilities accommodates four microphones into two preamplifiers, three turntables, two tapes or projectors, network and three remote lines. Three utility keys are provided for your individual needs. The Studioette also includes a high gain program amplifier, 10 watt ultra linear monitoring amplifier, dual muting and warning light relays, 4" illuminated VU meter, complete cueing facilities for turntables, net, tapes and remotes, and output emergency key.



STUDIOETTE 4-CHANNEL SPEECH INPUT SYSTEM



Above, lid is completely removed. Front panel hinges out to reach every "behind the panel" component. Cleaning the step type controls or replacing the meter lamp can even be enjoyable. The amplifier deck hinges up so that muting relay contacts are at finger tip when touch-up burnishing is required. Tubes may be slipped out for checking in half the time and half the element of breakage.

SPECIFICATIONS

MIXING CHANNELS: There are four mixing channels. Each is key selected to either the program or monitor bus. The monitor bus also feeds an external pair of terminals for recording, etc. Each mixing channel is low impedance and has a step type control having 20 steps of 2 db. Channels 3 and 4 have cue position at infinity or off position of the mixer. The block diagram excellently illustrates the function of the mixer as related to circuit control.

PREAMPLIFIERS: Two are supplied as standard equipment. Space is allowed for a third M5215 preamplifier which may be added, when needed, in a few minutes. As three unwired spare (utility) keys are part of the Studioette front panel complement, the third preamplifier may accommodate two more microphones and connected as one leg of the 3-input turntable channel. As space is also provided for two more muting relays, the extra preamplifier is compatible with the speaker muting requirement.

IMPEDANCES:

Input to preamplifiers, 30/50 and 150/250 ohms.
Turntable inputs, 150/250 ohms.
Tape, network, remote line inputs, 500/600 ohms.
Program line output, 500/600 ohms.
Monitoring amplifier output, 8 and 16 ohms.*

*When monitoring amplifier is used as emergency program amplifier, a bridging pad converts to 500 ohms impedance. Also may be used with ZY2003 speaker matching transformer where 500 ohms to speakers is desired (see Index "Speaker Matching Transformers").

- GAIN:** (a) Any preamplifier input to program line output 103 db. ± 2 db.
(b) Any preamplifier input to monitoring amplifier output 140 db. ± 3 db.
(c) Any turntable, net, tape or remote line input to program line output 63 db. $+ 2$ db.
(d) Any turntable, net, tape or remote line input to monitoring amplifier output 100 db. ± 3 db.

NOTE: Gain of monitoring amplifier is reduced by a fixed pad when operating from output of the program line.

RESPONSE: Program circuits $\pm 1\frac{1}{2}$ db, 30-15,000 cycles.
Monitor (audition) circuits ± 2 db, 30-15,000 cycles.

OUTPUT LEVELS AND DISTORTION: Program line maximum of +8 dbm at 1% or less distortion. Monitoring amplifier maximum of +40 dbm (equivalent to 10 watts) at 1% or less distortion.

NOISE: Program circuits including preamplifier, 60 db below +8 dbm output with -60 dbm input. Equivalent noise input is -120 dbm. Monitor (audition) circuits, 55 db below +40 dbm output.

TUBES: Preamplifiers, each (2) 5879.
Program amplifier, (3) 5879, (1) 12AU7.
Monitor booster amplifier, (1) 12AX7.
Monitor amplifier, (2) 12AX7, (2) EL84.
Power supply, (2) OA2, (1) GZ-34.

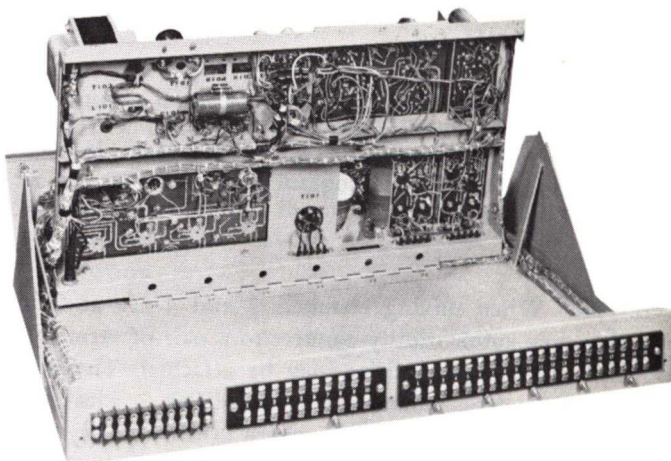
TOTAL TUBES: 16.

TOTAL TUBE TYPES: 6.

RELAYS: Two are supplied as standard with space for two additional relays where needed. These relays operate in conjunction with microphone keys S1 and S2 and mixing keys S12 and S13 (see functional diagram). Any muting arrangement is possible. Relay contacts are supplied for operation of warning lights as well as loudspeaker muting.

SIZE: 24" wide, 8 $\frac{1}{4}$ " highest point, 17" deep.

WEIGHT: Net weight, 55 lbs. Packed weight, 70 lbs.



Above is the reverse view of the top illustration. Here the wonderful uniformity and reliability of printed wiring tells the obvious story of excellence. Each amplifier is always the same as each wire is always in the same errorless place with no possibility of insulation chafing or deterioration. In servicing, there is no maze of wires winding under and above components. The chance of rosin joints is essentially eliminated with the machine soldering technique in printed wiring.

STUDIOETTE 4-CHANNEL SPEECH INPUT SYSTEM

CUBAGE: 4.6 cubic feet.

POWER: 115 volts, 50/60 cycles.

POWER CONSUMPTION: 120 watts.

TERMINATIONS: Numbered screw terminals.

FINISH: Cabinet in medium, hand rubbed, gloss gray. Panel in second tone of gray with escutcheons in anodized black and natural aluminum.

ADDITIONAL FACILITIES include an output emergency key where the program line may be switched to the monitoring amplifier output in case of a noisy tube, etc., developing in the program amplifier during a broadcast. A monitor selector key switches the monitoring amplifier input to: (1) program line for monitoring, (2) external terminals for external input, and (3) audition buss of the mixing system. A headphone jack is across the program line at all times. — The 4" illuminated VU meter is flush mounted with the case back panel mounted. The meter is connected to the program line and indicates +8 VU at 0 scale reading.

POWER SUPPLY is self-contained in the Studioette and supplies all voltages for filament and plate requirements. Extra capacity is available for the optional third preamplifier and optional muting relays.

MONITORING AMPLIFIER is ultra linear type and delivers a full 10 watts at 1% or less distortion. Also 100% printed wiring.

MONITOR BOOSTER: A two-stage printed wiring amplifier between the audition bus of the mixer and input to the monitoring amplifier. This feature provides balanced level between the program and audition bus so when switching the operator needs not readjust gain settings.

CUEING: When mixing channels 3 and 4 are at OFF position, they automatically connect to a pair of terminals to which a cueing amplifier may be attached. The new Gates M5377 desk mount cueing amplifier is ideal for this service and is described elsewhere in this catalog (see Index, Cueing Amplifier). — With this feature, all circuits feeding mixing channels 3 and 4 may be prechecked including turntables, network, tape inputs and remote lines.

TAPE INPUTS: Two keys select two tape recorder inputs to mixing channel 4 or cue override. Tape inputs may be

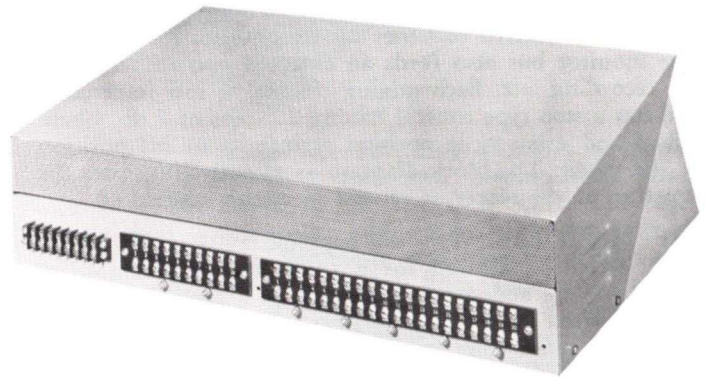
utilized for projector inputs where the Studioette is employed in TV.

TURNTABLE INPUTS: Three keys accommodate three turntable inputs. These keys permit switching each of three turntables to either mixing channels 3 or 4.

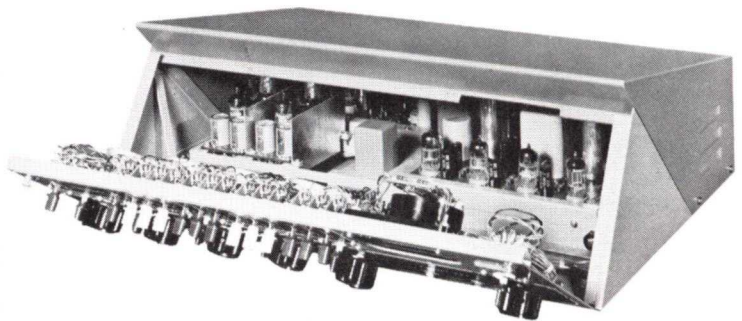
REMOTE LINES: Three keys select three remote lines in three positions: (1) mixing channel 4 for broadcasting, (2) override, and (3) program cue to the remote line.

SPEAKER MATCHING TRANSFORMER: Where two or three speakers are used, a speaker matching transformer is normally not required. Where more speakers are used, the A30601 matching transformer, 48 ohms to 8 ohms, is available as an optional accessory.

NOTE: All gain measurements are ± 2 db.



Studioette — Rear view.

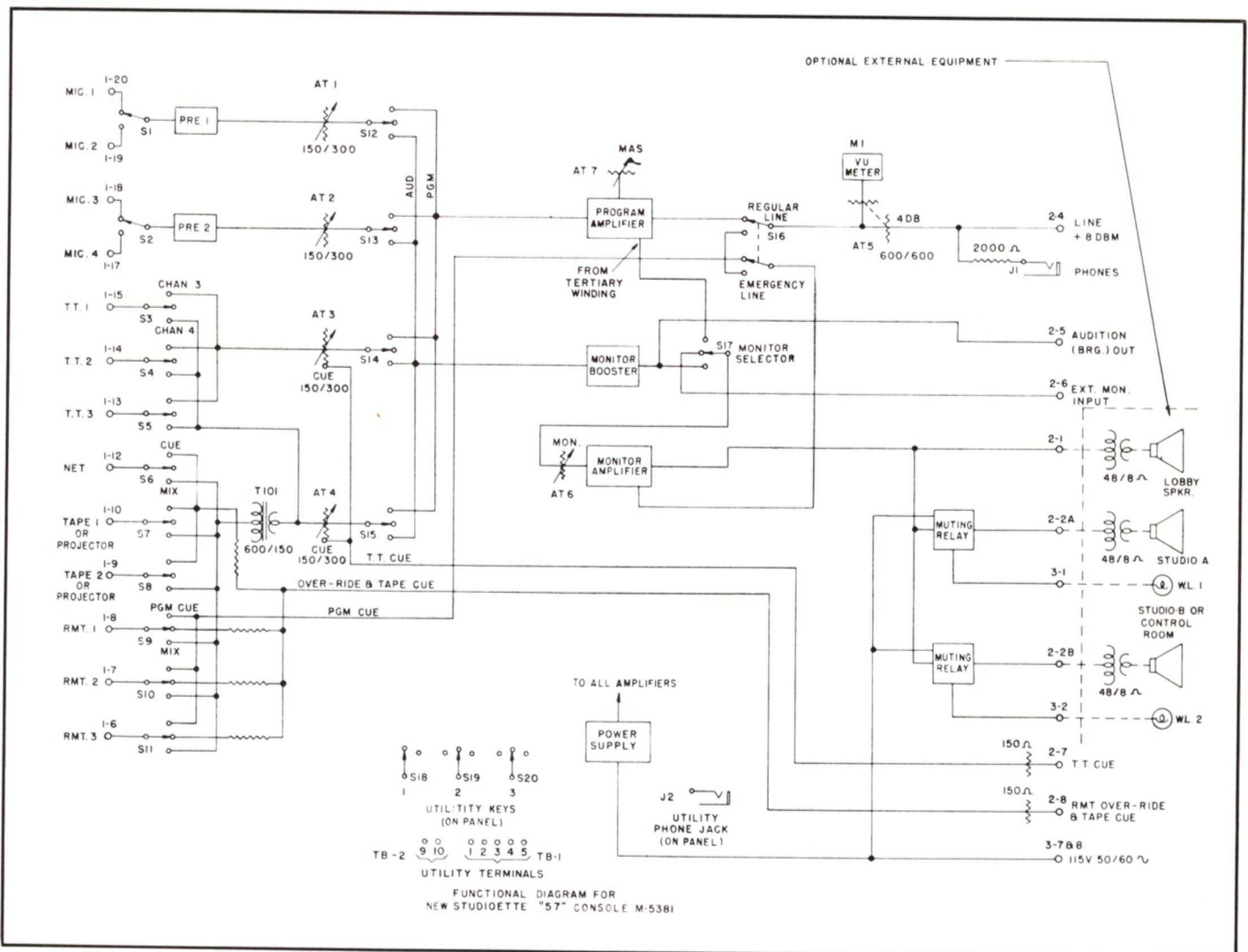


The front panel hinges to the cabinet base.

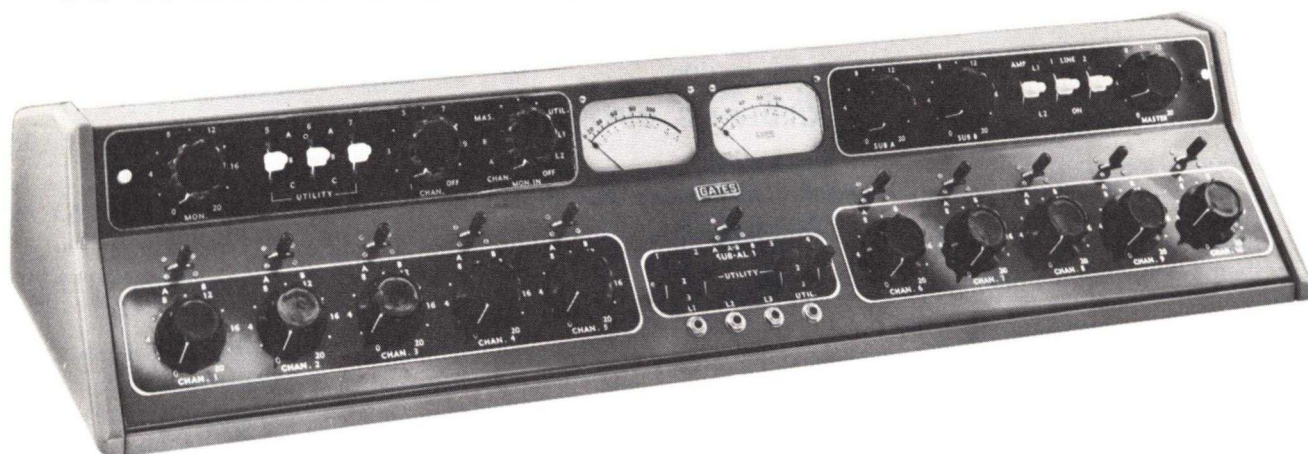
STUDIOETTE 4-CHANNEL SPEECH INPUT SYSTEM

ORDERING INFORMATION

Studioette console complete with tubes, two preamplifiers and two muting relays, ready to use	M-5381
Extra preamplifier for above	M-5304
Extra muting relay for above	AK-12626
Speaker matching transformer	A-30601
Spare 100% tube kit for Studioette	TK-270



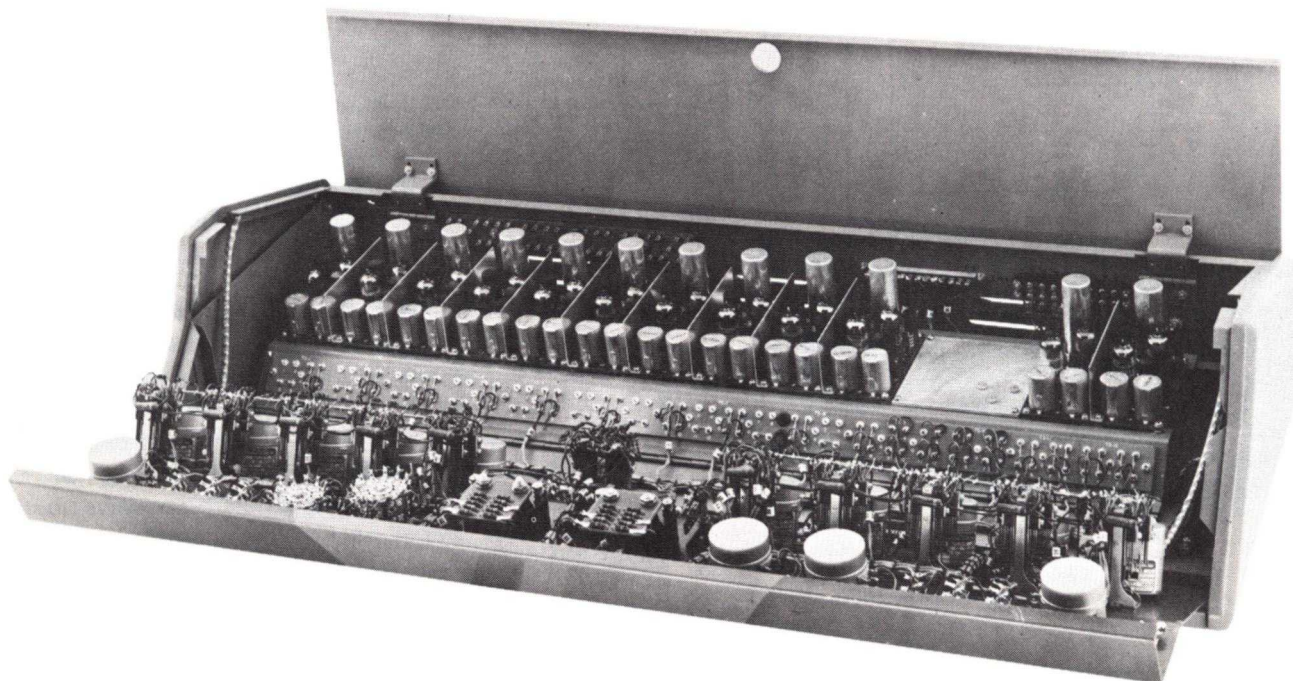
TV-10 AUDIO CONTROL CONSOLE FOR TELEVISION



Here is a ten channel speech input system designed to handle large television productions yet versatile enough to accommodate the smallest without complexity. Ten mixing channels are key selected into two program buses, each with its own program amplifier. Each program bus has its own sub-master gain control. By key selection, any combination of channels may be faded as a group and the remaining combination faded as another group, or by the flip of a key, all may be faded together.

Ten or any lesser number of preamplifiers may be used. Six are standard equipment leaving four high level channels for projector, tape and turntable needs. However, the provision of seven unwired utility keys would permit switch control of all projectors, tapes and turntables into one channel, leaving nine with preamplifiers for microphone service.

Booster amplifiers for each program bus are inserted ahead of each sub-master gain control. Preamplifiers and booster amplifiers are on printed wiring boards for absolute uniformity.



TV-10 AUDIO CONTROL CONSOLE FOR TELEVISION

OUTSTANDING FEATURES INCLUDE:

- Ten mixing channels, all with step attenuators.
- Mixer keys select into choice of two program buses, each bus controlled by sub-master gain control.
- Master gain selectable to either program bus or combined program buses for total fade.
- 10 position selector for complete preview of each of 10 mixing channels.
- 10 position monitor selector for monitoring: (1) program bus A, (2) program bus B, (3) combined program buses, (4) Line 1, (5) Line 2, (6) Utility Line, (7) Four utility circuits at user's discretion.
- Back panel mount dual standard 4" VU meters.
- Dual "plug-in" high gain program amplifiers.
- Booster amplifier for each program bus.
- 10 preamplifier capacity. 6 supplied as standard equipment.
- 10 watt low distortion monitoring amplifier.

Two regulated power supplies, one for program section and second for monitoring amplifier. Use of electronic regulator adds greatly to noise reduction as well as stability.

7 unwired utility keys for use at station's discretion. Adds 21 circuits. 4 headset jacks — 3 for output lines plus utility jack usually wired to intercom.

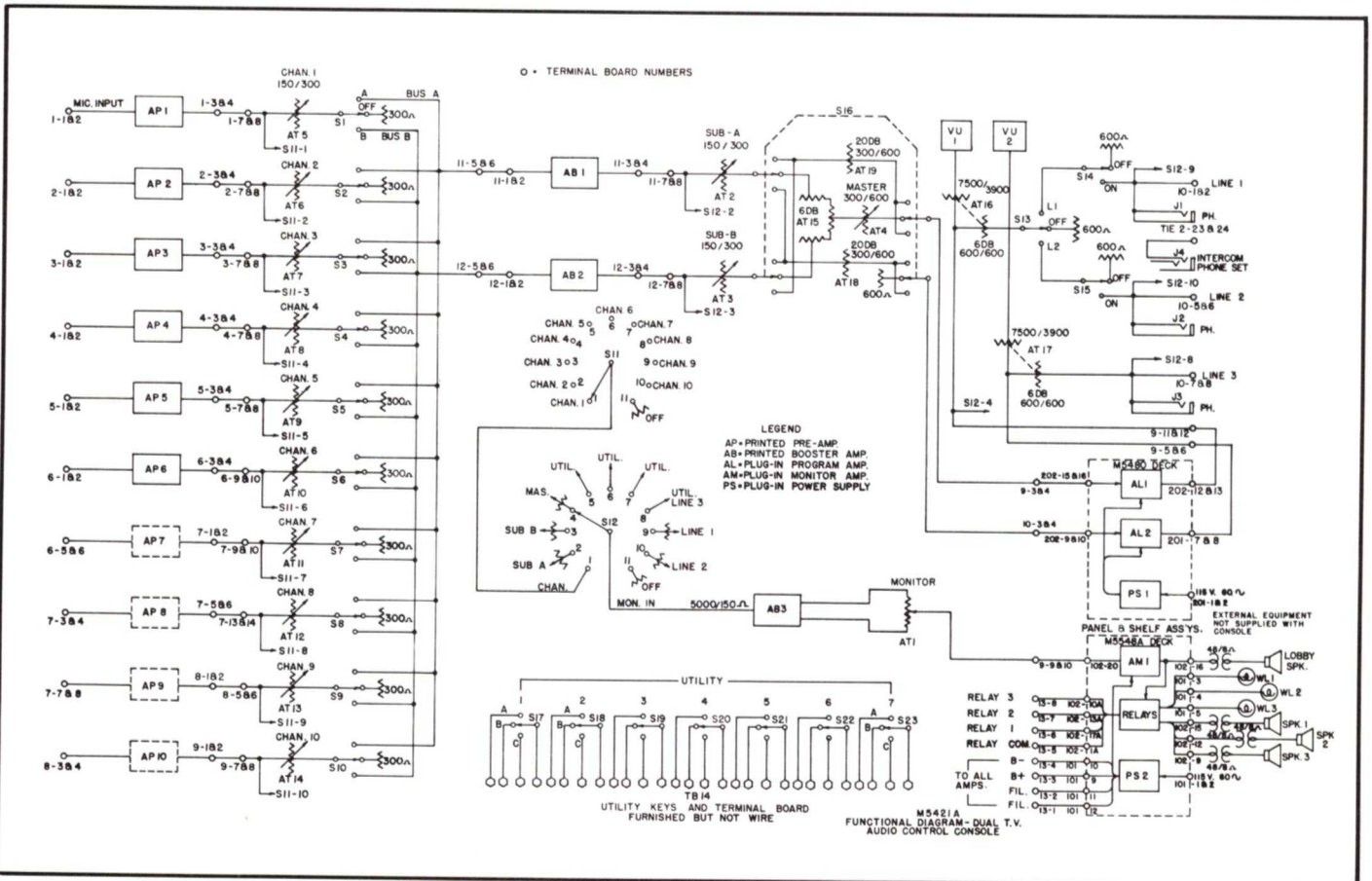
3 relays for warning light/speaker muting with knockouts for 2 more relays if needed.

Anodized lifetime escutcheons — no wear off of lettering — retains newness through years.

2 step functional design. Perfect over the top vision — only 7 1/2" high.

Instant serviceability. Hinged front panel, hinged inner chassis strip. Hinged cover.

No back of cabinet connections. All terminations inside for both shielding and convenience.



TV-10 AUDIO CONTROL CONSOLE FOR TELEVISION

SPECIFICATIONS ELECTRICAL

Microphone input to program line output (all channels):

GAIN: 106 db +2 db at 1000 cycles.
RESPONSE: +1.5 db. 30-15,000 cycles.
DISTORTION: 0.5% or less 50-15,000 cycles at +18 dbm output.
NOISE: 60 to 65 db below +8 dbm output with -60 dbm input.
CROSS-TALK: 65 db below +8 dbm at normal gain settings.*

High level channels (less preamplifiers):

GAIN: 65 db +2 db at 1000 cycles.
RESPONSE: +1.5 db 30-15,000 cycles.
DISTORTION: 0.5% or less 50-15,000 cycles at +18 dbm output.
NOISE: 65 db below +8 dbm output with -10 dbm input.
CROSS-TALK: 65 db below +8 dbm at normal gain settings.*

Monitoring amplifier:

GAIN: Provides maximum output with normal levels and control positions.
RESPONSE: +2 db 50-15,000 cycles.
DISTORTION: 1.5% or less 50-15,000 cycles at normal speaker levels, 3% or less at +38 dbm output (8 watts).
NOISE: 60 to 65 db below +30 dbm output at normal control settings.
CROSS-TALK: None.*

* Cross-talk is also governed by overall installations such as insertion of high and low level circuits in same house conduit.

SPECIFICATIONS MECHANICAL

SIZE: Console, 39" long, 7 1/2" high (lid down), 15 1/2" deep.
FINISH: Medium gray hand rubbed with second tone of light gray. Escutcheons anodized black. Knobs black with color disc inserts. Panel and shelf units in medium gray hand rubbed.
WEIGHTS: Console, 50 lbs. Panel and shelf units with equipment, 80 lbs. Packed weight, 250 lbs. Cubage 16.
POWER: 105/125 volts, 50/60 cycles, 150 watts input with 6 preamplifiers, 170 watts input with 10 preamplifiers.

OTHER SPECIFICATIONS

VU METERS: 2 supplied, standard 4" illuminated back panel mounted. Reads output each program amplifier at +8 VU.

TERMINATIONS: To inside rear of both console and panel and shelf units. No exposed terminations.

PATCH PANEL: Terminals with jumpers for insertion of patch jacks at all major circuits (see Block Diagram).

ATTENUATORS: Ten mixing attenuators, 20 steps of 2 db. All low impedance 150/250 ohms. Sub-master gain controls, 20 steps of 2 db. Master gain control, 20 steps of 2 db. Use of high impedance mixing is entirely avoided.

UTILITY KEYS: 7 keys (4 bottom center above jacks and 3 top left level) are supplied with terminal strips but unwired. Each key has 3 positions, or 7 keys may be wired to handle 21 low impedance circuits as desired by user. It is well to re-emphasize the patch panel facility (above) to fully determine the maximum flexibility of the TV-10 console.

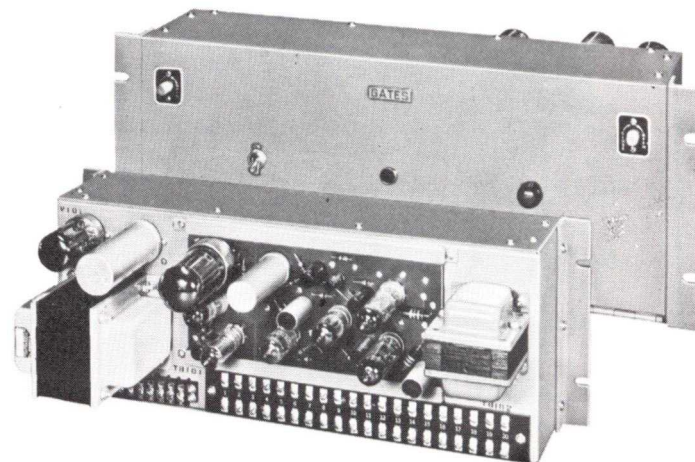
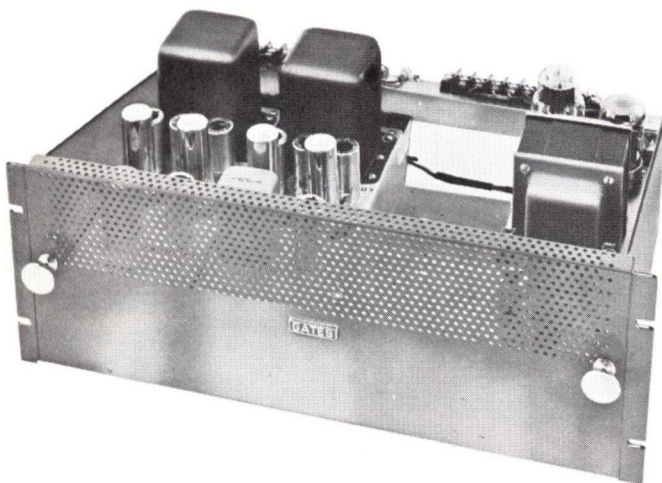
TUBES: Preamplifiers (6), two 5879.
Booster amplifiers (2), two 5879.
Program amplifiers (2), one 5879, three 12AU7.
Monitor amplifier (1), two 5879, 6AQ5, one 12AU7.
Power supplies (2), two OA2, one 5V4G, 5879, 6080.
Total Tubes: (22) 5879, (7) 12AU7, (2) 6AQ5, (2) 5V4G, (2) 6080 and (4) OA2.

ORDERING INFORMATION

TV-10 Speech Input Console complete with tubes, two regulated power supplies (one panel and shelf assembly, one drop-panel housing), dual program amplifiers, dual power supplies, relay unit and monitoring amplifier M-5421A

Extra preamplifiers with tubes M-5304

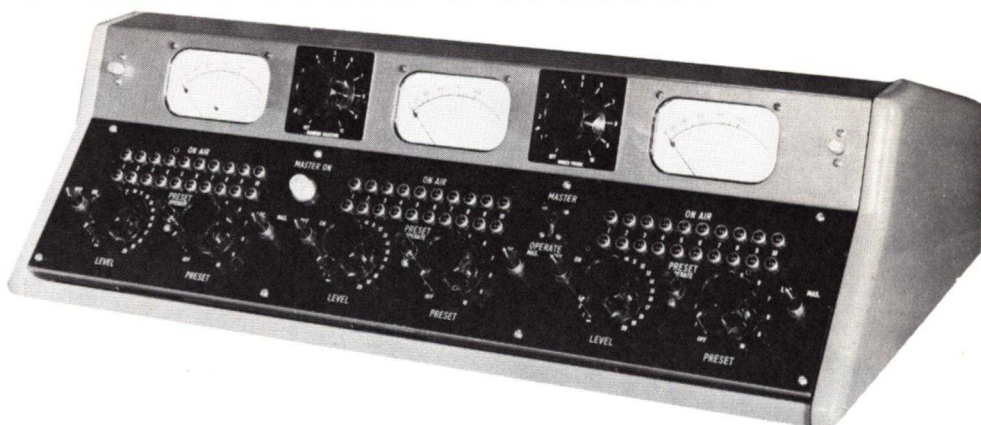
Spare tube complement for TV-10 Console .. TK-295



MASTER PRESET CONTROL CONSOLE

Large studio installations involving many control points and several outgoing circuits are usually best suited to master control. As technical requirements vary from one installation to another, no particular attempt is made to offer the broadcaster a standardized type of master preset equipment. However, by reason of the generous number of preset installations that have been designed and furnished by Gates, it is relatively simple to adopt standard procedures to the custom requirements of the customer. Gates engineers will gladly confer at any time with those interested in more complex studio equipment requirements.

The preset unit, illustrated herein, is based around a parallel preset relay system. Divided into three sections, ten relays in each unit are employed for program switching and are preset from the front panel. These relays are



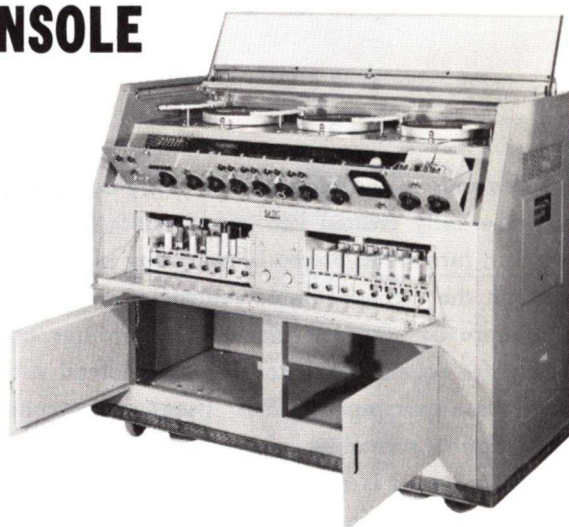
then controlled by a master relay. A double light bank indicates the preset circuit. Red is "On Air". Green is "Preset". The lever key locks up to "Master" and is non-locking down to "Operate".

It will be noted that though complete in every detail, the space requirements are held to a minimum as can be observed by comparing the 4" VU meter size to the total width and height. Prices on Preset equipment will be gladly supplied in accordance with station needs.

MOBILE SOUND EFFECTS CONSOLE

In program production, the sound effects console plays a very important part. The CSE-9 sound effects console has been designed to provide the sound department with a unit having every modern feature, handling ease, and the same quick serviceability, in case of trouble, that will be found in any modern up-to-date speech input system.

Six input circuits, two for microphones and four for pickups, feed into a program amplifier as well as a power amplifier. Each of these six channels has ladder attenuators with cue position at infinity. This cue output feeds into a split headphone arrangement. Four circuits are handled: (1) program cue, (2) sound effects cue, (3) sound effects out, and (4) director's cue. The two microphone channels are provided with PRE-4 plug-in preamplifiers, and the four pickup channels are provided with PRE-3 preamplifiers with high and low roll-off. In addition to individual equalization of each pickup, a master sound effects filter is provided, with complete high and low roll-off. — It can be said with accuracy that nearly any type of response curve may be obtained to provide the effect desired.



Cabinet is rigidly constructed of light metals to assure easy mobility on the silent rubber-tired wheels that may be locked in place for permanence. Front control panel hinges down for servicing. When not in use, the plexi-glass copy stand pulls up and over the turntables and control panel.

SIZE OF CSE-9 SOUND EFFECTS CONSOLE: 60" wide, 27½" deep, 48" high overall.
POWER: 115 volts, 50/60 cycles, approximately 400 watts.
WEIGHT PACKED: 400 lbs. Cubage, 75.

ORDERING INFORMATION

Sound effects console complete with tubes, less loudspeaker CSE-9
100% spare tube complement TK-155

CB-500 TRANSCRIPTION TURNTABLE

16 INCH



Today's demands in the broadcasting of transcribed music have automatically created new performance demands on transcription turntables. Stereo broadcasting places greater emphasis on the vertical rumble content of the turntable. Greatly improved standard monaural recordings of the LP variety are equally quick to emphasize lateral rumble. To meet these exacting demands, Gates offers commercial transcription turntables with an entirely new design principle. The result is a new low in rumble content and with many other performance specifications being substantially upgraded to fit today's needs and tomorrow's absolute demands.

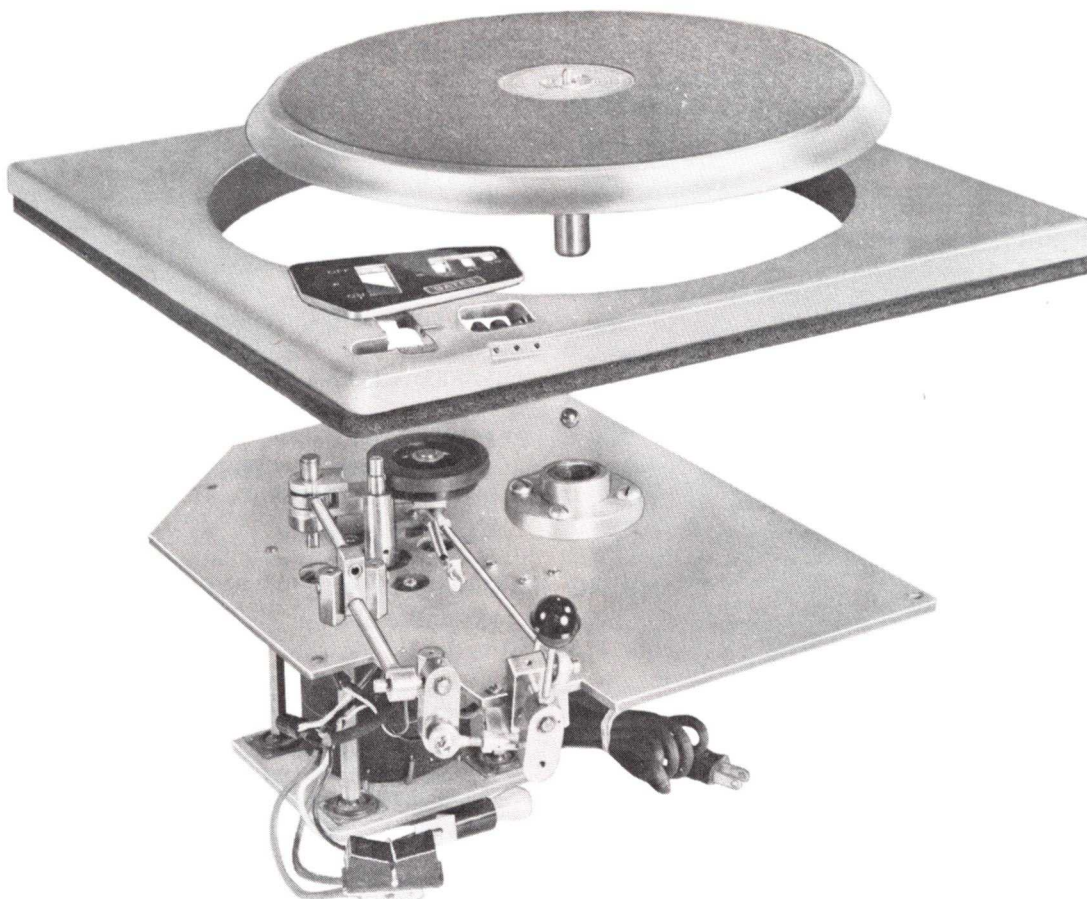
Heart of the CB-500 design is a drive hub which is part of the machined turntable platter and about one-half the radius of a 45 RPM disc. The single idler wheel for all three speeds is floating and self-aligning. A 600 RPM hysteresis synchronous motor with 3-speed pulley engages the idler wheel to the inner hub (see Fig. 2). The combination of the lower speed motor, one-third that of other

models, and the driver section (hub) being located inside the playing surface, reduces the rumble so remarkably that production line turntables now exceed earlier laboratory standards.

Some rumble or noise reduction has been accomplished before but with the sacrifice of up-to-cue speed. The CB-500 turntable will come up to speed at 33-1/3 RPM in 1/8 turn, and at 45 RPM in 1/6 turn. This is equivalent or superior to other recognized quality turntables which usually have higher rumble content.

Speed change is exact and functionally correct. All 3 speeds shift across a single indexed plate. A mercury type start-stop switch illuminates when on. The operator may start his turntable in three modes: (1) the silent, illuminated and functionally correct rocker arm start switch, (2) by moving the index lever to the speed designed, or (3) slip cueing. Any method is smooth and free of jumping or grabbing.

CB-500 TRANSCRIPTION TURNTABLE



The cut-away illustration exemplifies the fine machining and workmanship. Chrysler oilite bearings are used at all bearing points including the large center spindle bearing. Speed shift linkages are through monoball self-aligning bearings for smooth, silent and trouble-free operation. There are no belts, planetary drives or gear trains to wear.

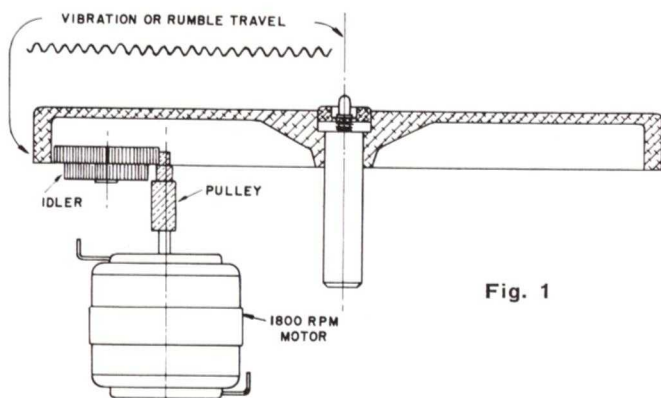


Fig. 1

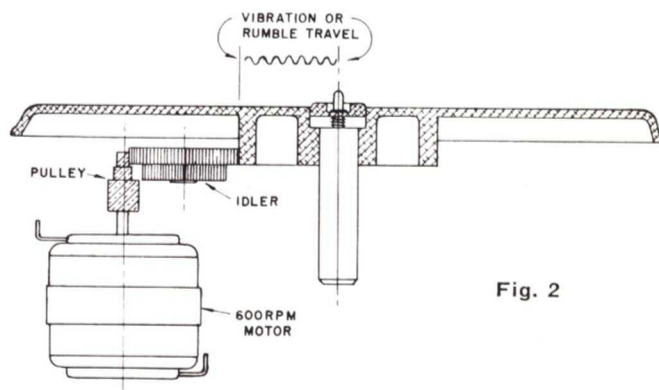


Fig. 2

Heretofore, all rim drive turntables, as the word implies, drove against the outer rim of the platter. Vibration, or what is usually called rumble, was returned to the center spindle or bearing across the entire playing surface of the platter. This type drive required an 1800 R.P.M. motor for proper speed ratios. The greater the motor speed, the greater the vibration, no matter how slight it might be. Likewise, higher motor speeds raise the audio frequency of this vibration or rumble.

In both the 16 and 12 inch Gates turntables, the drive is against a solid inner hub, away from the usable playing surface of the platter. Likewise, any minute vibration or rumble is pushing against the center bearing instead of pulling away, such as in outer rim drive turntables. With this exclusively new drive system, a 600 R.P.M. hysteresis synchronous motor is used. Lower motor speed assures lower vibration or rumble. The lower speed substantially drops the audio frequency of this much lower motor vibration to where much of the rumble is in the sub-audible spectrum.

CB-500 TRANSCRIPTION TURNTABLE SPECIFICATIONS

CHASSIS SIZE: 21 $\frac{1}{4}$ " x 21 $\frac{1}{4}$ " x 1-5/16".
 MOTOR HANG BELOW BOTTOM OF CHASSIS: 47/8"
 CONSTRUCTION: Both platter and base of machined aluminum.
 FINISH: Gray enamel with escutcheon in black and turntable platter cover in heavy green felt.
 PLATTER SIZE: 17".
 STROBOSCOPE: Inbuilt on platter for all 3 speeds.
 CENTER SPINDLE: Spring locking type, snaps up for 45 RPM hub, locks down for smaller spindle records.
 CENTER BEARING: 1" diameter hardened steel rotates in Chrysler oilite bearing.
 MOTOR: Hysteresis synchronous, single phase, 600 RPM with 2 $\frac{1}{2}$ mfd. running capacitor and 40° C temperature rise.
 CUE ALLOWANCE: At 33-1/3 RPM, 1/8 turn.
 At 45 RPM, 1/6 turn.
 At 78 RPM, 3/4 turn.

NOISE OR RUMBLE:

At 33-1/3 RPM, rated —45 db., capable —50 db.
 At 45 RPM, rated —40 db., capable —45 db.
 At 78 RPM, rated —35 db., capable —39 db.

WOW: Rated 0.15% at 33-1/3 RPM, capable .08%.

FLUTTER: Rated 0.07% at 33-1/3 RPM, capable .05%.

MOTOR START: Rocker type mercury switch. Push front for "ON" and back for "OFF". Switch illuminates when on.

IDLER WHEEL: Special shear action neoprene, self-aligning.

SPEED CHANGE: To 33-1/3, 45 or 78 RPM by single indexed lever control.

POWER: 115 volts, 60 cycles, 35 watts. (50 cycle available, see below.)

SHIPPING WEIGHT: 54 (net weight, 34 lbs.)

CUBAGE: 3 cu. ft.

ORDERING INFORMATION

Transcription turntable chassis only, for 115V, 60 cycles **CB-500**
 Transcription turntable only, for 115V, 50 cycles **CB-500-50**

Gates purchased a sample of all leading transcription turntables, both 16" and 12". All tests were made under identical conditions, on the same floor location, the same mounting, the same pick-up, the same test equipment, etc.

The engineer making these tests was instructed to not only be

fair but give any non-Gates turntable the benefit of the doubt. To be entirely fair, the Gates turntable tested was selected at random. The fairness of these tests is indicated by the fact that all but two of the turntables tested met NAB requirements. (Manufacturer's specifications were taken either from catalogs or instruction books, as the case may be.)

TEST COMPARISONS OF LEADING FRICTION DRIVE TURNTABLES

	GATES CB500	COMPANY "A"—16" T.T.	COMPANY "B"—16" T.T.	COMPANY "C"—16" T.T.	COMPANY "D"—16" T.T.	COMPANY "E"—12" T.T.	COMPANY "F"—12" T.T.	COMPANY "G"—12" T.T.	N. A. B. SPECS.
RUMBLE AT 33 $\frac{1}{3}$ R.P.M.	—50 Db.	—35 Db.	—32 Db.	—34 Db.	—39 Db.	—44 Db.	—34 Db.	—37 Db.	35 Db. BELOW 7 CM/SEC. SIGNAL AT 1000 CYCLES
RUMBLE AT 45 R.P.M.	—45 Db.	—37 Db.	—34 Db.	—32 Db.	—38 Db.	—44 Db.	—32 Db.	—36 Db.	
RUMBLE AT 78 R.P.M.	—39 Db.	—22 Db.	—32 Db.	—28 Db.	—35 Db.	—41 Db.	—34 Db.	—30 Db.	
PLATTER TURNS TO { 33 $\frac{1}{3}$ R.P.M.	1/8	1/6	1/8	1/8	1/8	1	1-1/4	1/6	NO APPARENT SPECIFICATION FOR THIS IMPORTANT FUNCTION
45 R.P.M.	1/6	3/8	1/4	1/6	1/4	1-1/4	2-1/2	3/8	
FULL SPEED { 78 R.P.M.	3/4	5/8	1	3/8	3/4	2-1/2	3-1/4	1	
WOW 33 $\frac{1}{3}$	0.08%	0.04%	0.1%	0.15%	0.07%	0.15%	NOT TESTED BUT CONSIDERED EXCELLENT	0.2%	0.2% BOTH WOW AND FLUTTER. TESTED AT 33 $\frac{1}{3}$ R.P.M. AS HIGHER SPEEDS WOULD NORMALLY INDI- CATE IMPROVED MEASUREMENTS
FLUTTER 33 $\frac{1}{3}$	0.05%	0.04%	0.07%	0.15%	0.04%	0.07%		0.02%	

BELOW IS WHAT EACH MANUFACTURER CLAIMS IN HIS PUBLISHED CATALOGUE LITERATURE

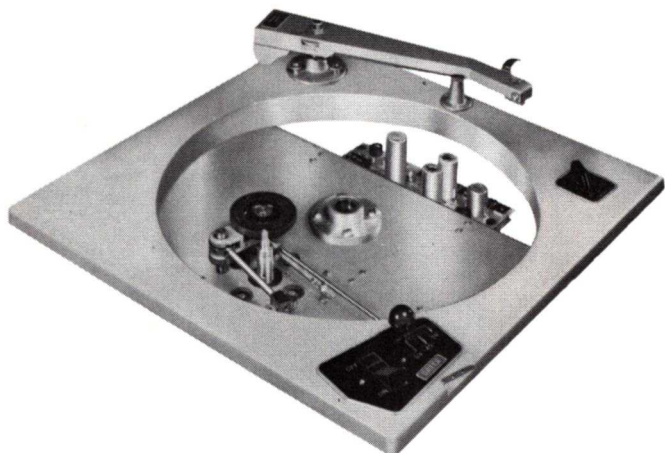
	33 1/3	—45 Db.	STATES —50 Db. WITHOUT DEFINING SPEED	STATES —50 Db. WITHOUT DEFINING SPEED	STATES APPROX. —40 Db.	—35 Db.	STATES —53 Db. WITHOUT DEFINING SPEED	STATES EXCEEDING NAB SPECS BY GOOD MARGIN	STATES ALMOST NON- EXISTANT	CATE IMPROVED MEASUREMENTS
	45	—40 Db.				—35 Db.				NOTE: ALL TESTS MADE UNDER IDENTICAL CONDI- TIONS AND WITH AMBIENT NOISE —50 Db. OR BETTER.
	78	—35 Db.				—35 Db.				
PLATTER TURNS TO FULL SPEED	{ 33 1/3 45 78	1/8	1/4	DOES NOT SPECIFY	1/8	STATES APPROX. 1/2 TURN	DOES NOT SPECIFY	DOES NOT SPECIFY	DOES NOT SPECIFY	
		1/6	1/4		1/4					
		3/4	3/4		1/2					
WOW	33 1/3	0.15%	STATES BETTER THAN N. A. B.	DOES NOT SPECIFY	DOES NOT SPECIFY	0.2 to 0.25%	BETTER THAN N. A. B.	DOES NOT SPECIFY	LESS THAN 0.2%	
FLUTTER	33 1/3	0.07%							LESS THAN 0.05%	

CB-510 - CB-525 TRANSCRIPTION TURNTABLES

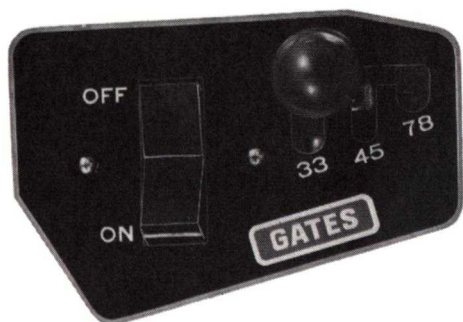
16 INCH



Shown above is the CB-510 complete operating transcription turntable. Includes CB-500 low noise chassis, GR-16 viscous damped pickup arm, twin flip over 1 mil and 2½ mil reluctance cartridge, 3-position variable equalizer to NAB, RIAA and high frequency roll off curves and M-5235 preamplifier with self-contained power supply. Output: 150/160 ohms at approximately -20 db.



Above is the CB-510 turntable with platter removed, showing the shift mechanism and self-contained preamplifier. The preamplifier bolts to the under side of the turntable chassis and has its own self-contained selenium power supply.



Shift speeds to 78, 45 or 33-1/3 RPM by simply moving shift lever to the desired index point — then touch the switch to either start or stop. Complete one-hand operation leaves the other hand free for cueing or control boards.



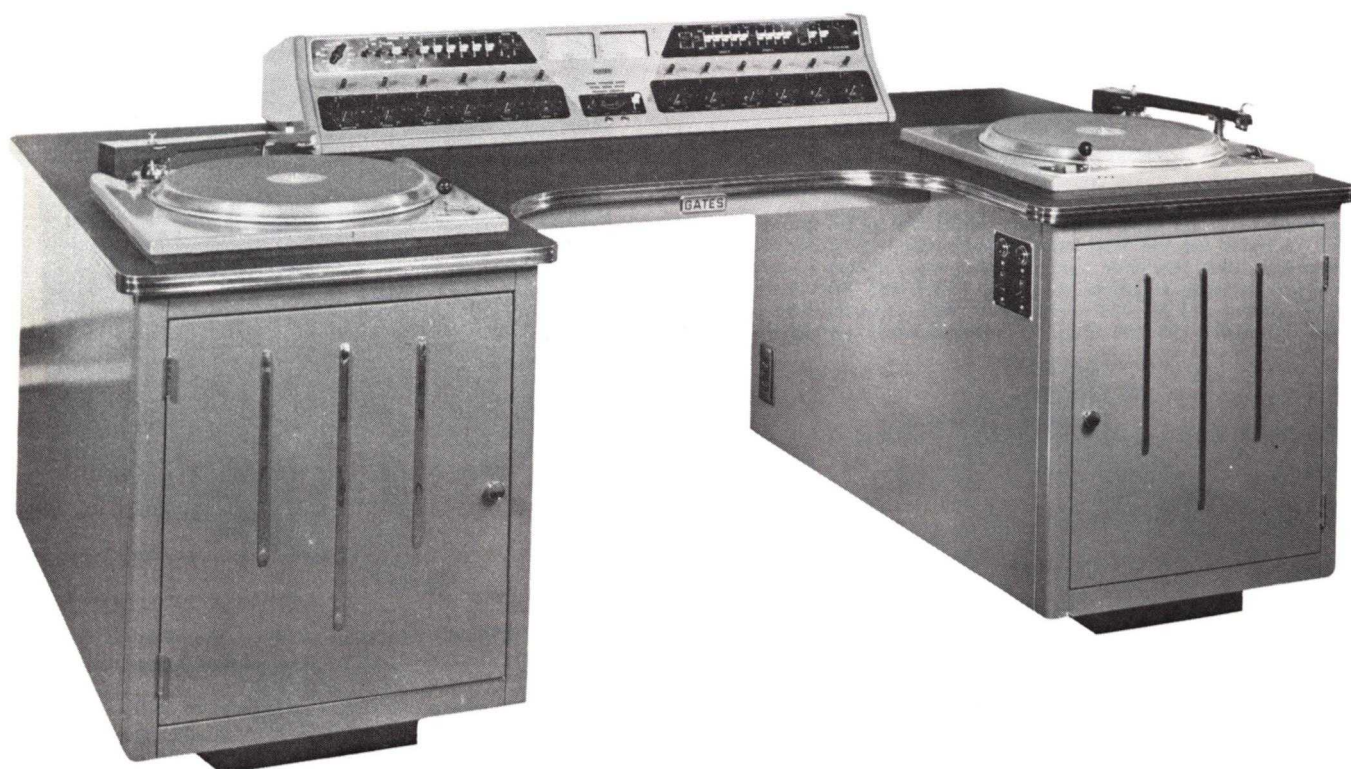
CB-525 and CB-525A turntable. This is the same as the CB-510 turntable but with the CAB-6 floor cabinet added.

CAB-6 cabinet. Has adjustable leveling screws, full size rear door. Made of 5-ply seasoned cabinet maker's birch, sealed and beautifully finished in gloss gray and black. Size: 21¼" wide, 21¼" deep, 29½" high plus 1" for leveling screws. For CB-500 chassis or CB-510 complete turntable.

ORDERING INFORMATION

- Complete transcription turntable including self-contained preamplifier, power supply, CB-500 chassis, 3-position equalizer, pickup arm and dual sapphire stylus CB-510
- Complete transcription turntable, same as above but with dual diamond stylus CB-510A
- Complete transcription turntable in cabinet, consisting of Model CB-510 above, mounted in CAB-6 cabinet CB-525
- Complete transcription turntable in cabinet, consisting of Model CB-510A above, mounted in CAB-6 cabinet CB-525A
- Cabinet only for CB-500 chassis CAB-6
- Step-down transformer, primary 230V, 50/60 cycles, secondary 115V M5830

CB-4 HORSESHOE DESK



Even though wonderfully attractive, the CB-4 desk is even greater in its functional usefulness. Here the turntables are on each side of the operator at the correct arm's length for relaxed operation.

Right and left wings are big and roomy. Designed with enough width to hold 19" rack panel equipment, but used as frequently for the tape and disc storage. Actually there is more than enough room for both. Here, indeed, is a show piece both in massive, eye-catching appearance and engineering correctness. Many broadcasters found the slight extra cost paid big dividends in better broadcasting through operator's pride in knowing he has the finest.

CB-4 HORSESHOE DESK

SPECIFICATIONS

CONSTRUCTION: Top of seasoned 7-ply selected birch covered with double thick black linoleum. Top edge is banded with a chrome style band fitting flush. Top is secured to two end wings having inside dimension of 22½" wide, 25" high and 45" deep. Each wing has a removable rear door and hinged front door. Wings are of seasoned plywood (selected birch) and will not warp or check. Each wing will accommodate 21" of 19" rack panel space. Wings may be used for disc or tape storage on one or both sides.

In wired models the desk is cut out for Gates CB-500 turntables on each side. Mercury type TT motor starting switches are provided on the inside of each wing. An additional master switch is provided on the inner right wing. Wiring is terminated to the rear base.

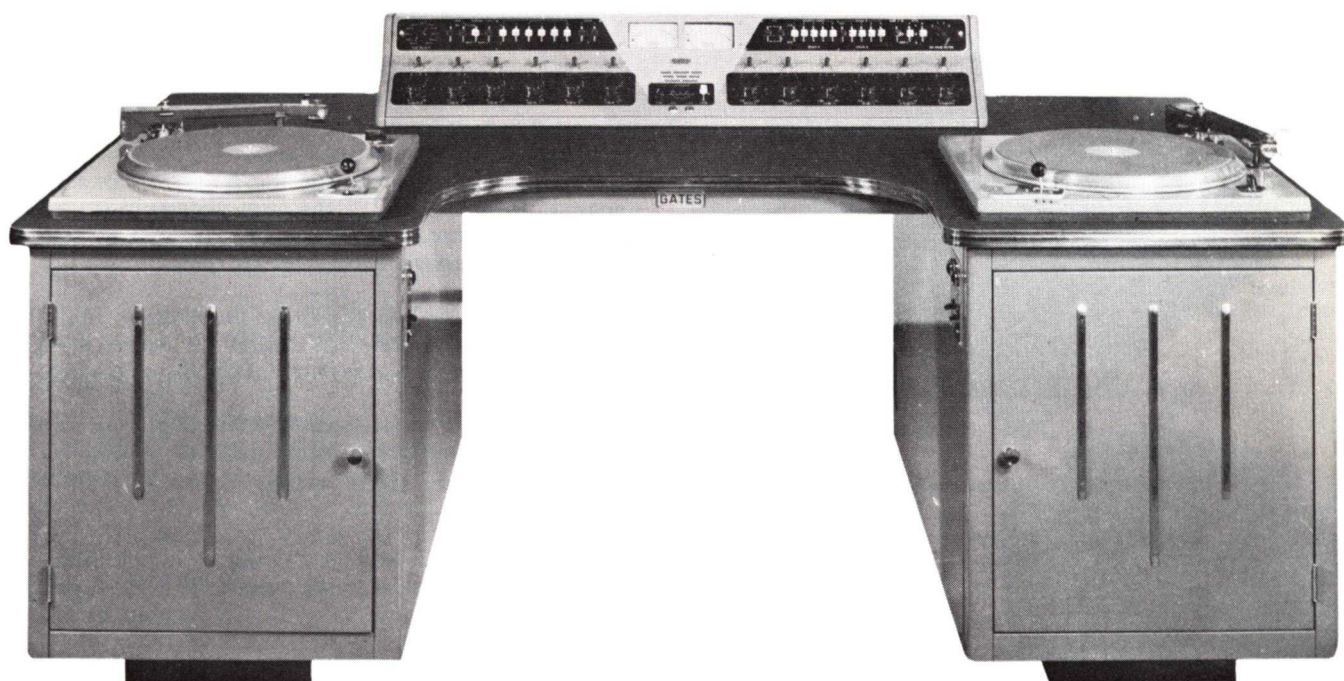
FINISH: Medium gray smooth lacquer presents metal finish. Use of wood is for best turntable performance as well as appearance. Top is black. Trim is chrome.

OTHER ACCOMMODATIONS: Most types of turntables and nearly all types of speech input consoles may be used with the CB-4 desk. Size is such that consoles of substantial width and depth may be employed without sacrifice of arm room or serviceability of console.

SIZE: Height 29", Width 84", Depth 48".

WEIGHT: Packed, 390 lbs.

CUBAGE: 120.



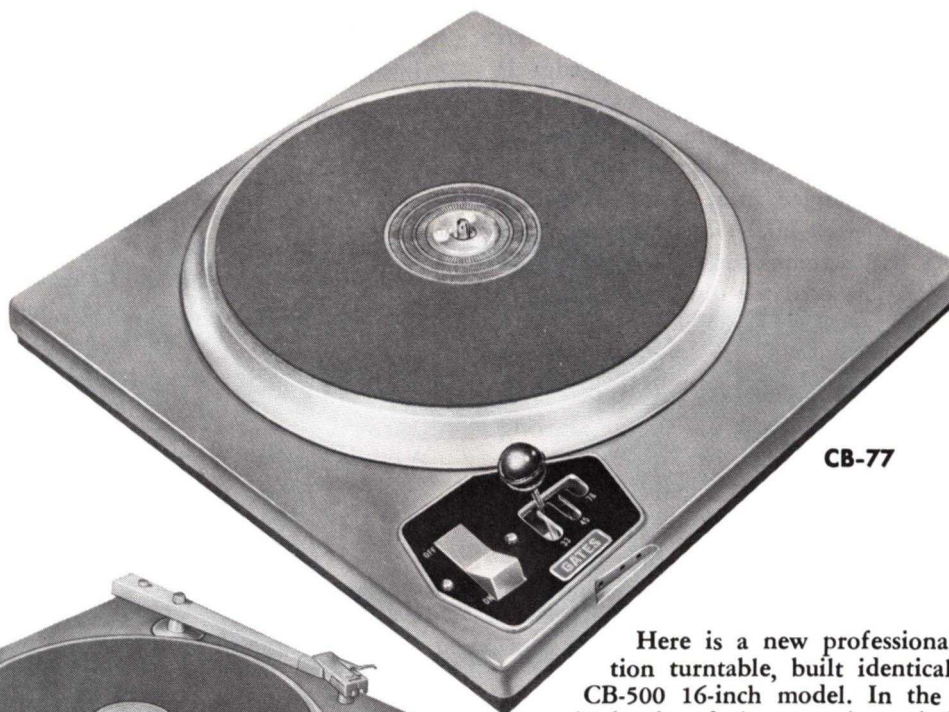
CB-4 DESK COMBINATIONS

Desk only with cutouts for CB-500 turntable, switches and wired	CB-4M
Desk only without cutouts or wiring	CB-4
Desk with two CB-510A turntables wired, includes pre-amplifiers	CB-4N
Desk with CB-500 turntables, Gray 106-SP arms, Gray 602 C equalizer, dual cartridge, 1 mil. and 2½ mil. diamond stylus, wired	CP-4P
Includes CB-4N listed above with Gatesway speech input console	CP-4R
Includes CB-4P listed above with Gatesway speech input console	CP-4S

NOTE: CB-4 desks may be used with any Gates Console. Above illustration shows CB-4 with Dualux speech input system. Select desk combination of your choice and add console price for total selling price.

12-INCH TRANSCRIPTION TURNTABLES

Models CB-77, CB-88, CB-880, CB-99



CB-77

Here is a new professional 12-inch transcription turntable, built identical to the companion CB-500 16-inch model. In the new CB-77 chassis will be found the same inner hub drive system, the same speed change system, the same rocker arm, illuminated off-on switch . . . the only difference is a reduced size, affording broadcasters a more compact turntable arrangement in today's busy control room.

Rumble is at a new low for either broadcast or high fidelity standards, while wow and flutter far exceed acceptable standards for high-quality commercial broadcasting.

Chassis size is 16 inches square. Now one, two or even a dozen turntables may be closely grouped. Along with the CB-77 chassis are several complete models with pickups and preamplifiers as well as new 12-inch cabinet styles.

MODEL CB-77: Chassis only, ready to attach pickup arm of your choice. For 33-1/3, 45 and 78 RPM with fast pick-up-to-speed and as low as -50 db. rumble in most instances.

MODEL CB-88: Complete transcription equipment. Includes CB-77 chassis, M5235 preamplifier listed Page 139, dual viscous damped Gray arm, twin flip-over 1 mil. and 2 1/2 mil. reluctance cartridge with your choice of sapphire or diamond styli, 3-position equalizer to NAB, RIAA and high frequency roll off curves and self-contained selenium power supply (part of preamplifier).

MODEL CAB-8 CABINET: Designed to house the CB-77 chassis or CB-88 complete turntables. 16 1/8" wide, 16 1/8" deep and 30" high with leveling screws. Over-all maximum height with chassis mounted is 32 3/8". Built of cabinet maker's birch with corner supports of steel and finished in two-tone gray and black. Back door removable for servicing.



CB-88



CB-880

MODEL CB-880: This model consists of the CB-88 complete turntable mounted in the CAB-8 single chassis cabinet listed at right.

CB-77, CB-88, CB-880, CB-99 12-INCH TRANSCRIPTION TURNTABLES

CB-77 SPECIFICATIONS

CHASSIS SIZE: 16" x 16" x 1-5/16".

MOTOR HANG BELOW BOTTOM OF CHASSIS:
5 3/4".

CONSTRUCTION: Both platter and base of machined aluminum.

FINISH: Gray enamel with escutcheon in black and turntable platter cover in heavy green felt.

PLATTER SIZE: 13 3/8".

STROBOSCOPE: Inbuilt on platter for all 3 speeds.

CENTER SPINDLE: Spring locking type, snaps up for 45 RPM hub, locks down for smaller spindle records.

CENTER BEARING: 1" diameter hardened steel rotates in Chrysler oilite bearing.

MOTOR: Hysteresis synchronous, single phase, 600 RPM with 2 1/2 mfd. running capacitor and 40° C temperature rise.

CUE ALLOWANCE: At 33-1/3 RPM, 1/8 turn.
At 45 RPM, 1/6 turn.
At 78 RPM, 3/4 turn.

NOISE OR RUMBLE:

At 33-1/3 RPM, rated —45 db., capable —50 db.
At 45 RPM, rated —40 db., capable —45 db.
At 78 RPM, rated —35 db., capable —39 db.

WOW: .15% maximum, capable .08%.

FLUTTER: .07% maximum, capable .05%.

MOTOR START: Rocker type mercury switch. Push front for "ON" and back for "OFF". Switch illuminates when on.

IDLER WHEEL: Special shear action neoprene, self-aligning.

SPEED CHANGE: To 33-1/3, 45 or 78 RPM by a single indexed lever control.

POWER: 105-125 volts, 60 cycles, 35 watts, (50 cycle model available, see below).

SHIPPING WEIGHT: 40 lbs. (net weight, 30 lbs.)



MODEL CB-99: Consists of two complete CB-88 turntables mounted in the dual cabinet, Model DTT-2, listed below. Where desired, the sloping front may be used for controls or switches at the user's discretion.

MODEL DTT-2 DUAL CABINET: Made of 1/16" cold rolled stretcher level furniture steel with bottom of 3/4" plywood to omit resonance. Front slopes where broadcaster desires to add controls for disc jockey models, etc. Finish gloss gray. Size: 37 1/8" wide, 19 3/4" deep and 33" high. Accommodates two CB-77 chassis or CB-88 complete turntables.

ORDERING INFORMATION

12-inch transcription turntable chassis only, 60 cycles	CB-77
12-inch transcription turntable chassis only, 50 cycles	CB-77-50
Complete 12-inch transcription turntable including self-contained preamplifier, power supply, CB-77 chassis, 3-position equalizer, pickup arm and dual sapphire stylus	CB-88
Complete transcription turntable, same as above but with diamond stylus	CB-88A
Complete 12-inch transcription turntable in cabinet, consisting of Model CB-88 above, mounted in single chassis floor cabinet ..	CB-880
Complete transcription turntable in cabinet, consisting of Model CB-88A above, mounted in single chassis floor cabinet	CB-880-A
Two complete CB-88 transcription turntables above, in dual 12-inch turntable floor cabinet	CB-99
Two complete CB-88A transcription turntables above, in dual 12-inch turntable floor cabinet	CB-99A
Single chassis cabinet only	CAB-8
Dual chassis cabinet only	DTT-2

TURNTABLE ACCESSORIES



**NEW GRAY ARM
WITH DUAL
VISCOUS-DAMPING**

This new Gray micro-balanced tone arm has sealed viscous-damping on both vertical and horizontal pivots for better tracking and lower resonance. It is completely statically balanced around the vertical pivot, providing maximum tracking stability. Designed for records up to 12-inches in diameter. Stylus force adjustable from zero to 15 grams, thus eliminating cartridge weights. Can be used with all popular cartridges. Use with 12" turntables only, such as CB-77.

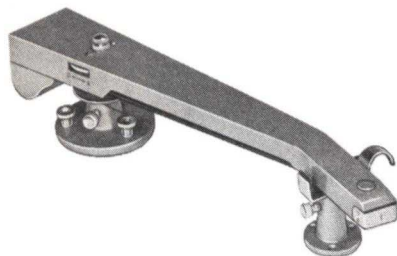
Gray Viscous Damped Arm Model 212



**GRAY 108-C
VISCOUS-DAMPED ARM**

Considered one of the finest professional tone arms in broadcasting, the Gray 108-C handles 16" discs or smaller. Viscous Damping makes it difficult for the arm to jump or skip across the record. Tone arm has maximum immunity to shock or vibration from speakers at low frequencies. Also features perfect tracking and adjustable dampening. Use with GE triple or single play reluctance pickup heads. Use with 16" turntables such as Gates CB-500.

Gray Viscous Damped Arm Model 108C



**GR-16
VISCOUS-DAMPED ARM**

This excellent tone arm employs the floating action viscous damped principle. Supported at one point by needle bearing and jeweled pivot in ball and

socket assembly in silica oil dampening fluid. Has variable side adjustment for exact stylus pressure. Accommodates all reluctance cartridges including triple plays. For 17" discs or less. Used in CB-510 and CB-525 models.

Viscous Damped Arm Model GR-16



GRAY EQUALIZER

Four-position equalizer for use with any low impedance pick-up cartridge and provides these curves: (1) NAB, (2) intermediate, (3) roll off, and (4) flat response. Output impedance 150/250 ohms. Supplied as illustrated with etched dial plate and knob. Used with low impedance cartridges only.

Transcription Pickup Equalizer Model 602-C

GE TYPE VR-2 PICKUP CARTRIDGES

Response 20-20,000 cycles with output of 22 MV at 10 CM/Sec. Tracking pressure only 4 grams. Has replaceable clip in stylus. Use high impedance type with Gates M-5235 equalized amplifier and Gates M-5530 preamplifier.

High Impedance VR-2 Triple Play (turnover cartridge)

Sapphire .001" and sapphire .003"	4G050
Diamond .001" and sapphire .003"	4G052
Diamond .001" and diamond .003"	4G053

High Impedance Single Stylus VR-2

Sapphire .003"	4G-040
Sapphire .001"	4G-041
Diamond .003"	4G-061
Diamond .001"	4G-063

Low Impedance VR-2 Triple Play (turnover cartridge)

Sapphire .001" and sapphire .0025"	4GD-01S02S
Diamond .001" and sapphire .0025"	4GD-01D02S
Diamond .001" and diamond .0025"	4GD-01D02D

Low Impedance VR-2 Single Stylus

Diamond .001"	4GS-01D
Diamond .0025"	4GS-02D
Sapphire .001"	4GS-01S
Sapphire .0025"	4GS-02S

Replacement Styli for VR-11

Sapphire .001"	4G-01S
Sapphire .0025"	4G-02S
Sapphire .003"	4G-03S
Diamond .001"	4G-01D
Diamond .0025"	4G-02D
Diamond .003"	4G-03D

Replacement "Clip in Styli" (for old RPX cartridges)

Sapphire .001"	RPJ-01S
Sapphire .0025"	RPJ-02S
Sapphire .003"	RPJ-03S
Diamond .001"	RPJ-01D
Diamond .0025"	RPJ-02D
Diamond .003"	RPJ-04D

Single Tip Replacements for RPX, 040, 041, 061, 063 cartridges

Sapphire .001"	RPJ-005
Sapphire .0025"	RPJ-006
Sapphire .003"	RPJ-001
Diamond .001"	RPJ-004
Diamond .0025"	RPJ-003
Diamond .003"	RPJ-002

Miscellaneous

Adaptor for using new VR cartridges in old GE-A1-501 arms	A1-504
Replacement parts kit for VR-11 cartridges	RKP-009B

M-5235 EQUALIZED PREAMPLIFIER

A specially designed 3-stage, high gain preamplifier with self-contained selenium power supply and external 3-position filter with escutcheon plate for mounting on turntable chassis. Filter has NAB, RIAA and high frequency roll off curves for all standard records and transcriptions used today. Output level —10 dbm. Should be used with high impedance reluctance cartridges or similar such as 4G050, 4G052, or 4G053, listed page 138.

SPECIFICATIONS

INPUT IMPEDANCE: For high impedance standard cartridges at essentially 12 mv. or lower.

OUTPUT IMPEDANCE: 150/250 or 500/600 ohms, balanced.

OUTPUT LEVEL: —10 dbm with normal level —20 dbm. High impedance termination also available, unbalanced.

RESPONSE: To NAB, RIAA and HF roll off curves.

NOISE: 55 db below —20 dbm. output or absolute noise —75 db.

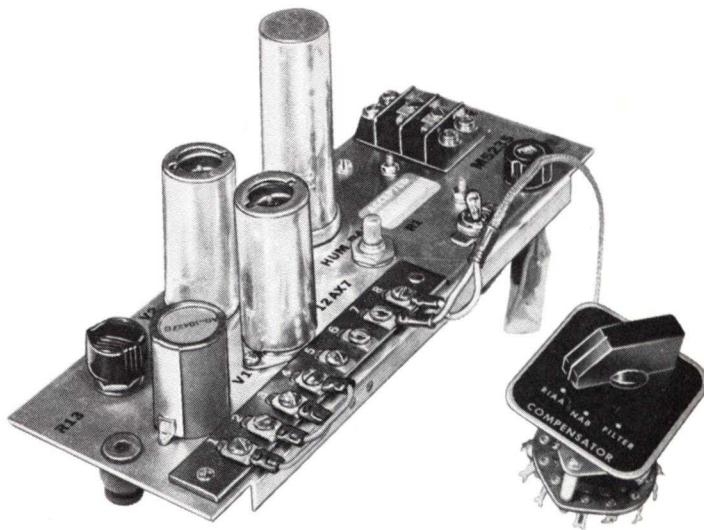
DISTORTION: 1% or less 50-15,000 cycles.

TUBES: 2 each 12AX7 with selenium rectifier.

SIZE: 9" long, 3³/₈" wide, 3" above chassis and 2¹/₄" below chassis.

FINISH: Gray.

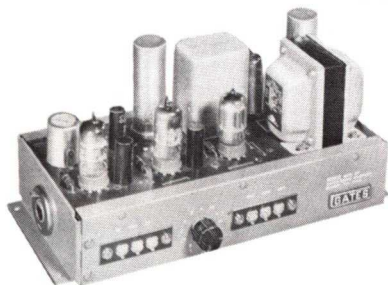
POWER: 115 volts, 50/60 cycles.



ORDERING INFORMATION

Preamplifier with equalizer and tubes	M-5235
Spare 100% tube kit	TK-225

M-5530 PREAMPLIFIER



Designed for all modern day, low level, pickup/equalizer systems and low impedance cartridges. When used with equalizers such as the 602-C, listed on Page 138, provides ample gain for good center-position mixing attenuator operation. Has 3 audio stages and self-contained power supply. Gates firm grip printed wiring (not printed circuit) assures 100% uniformity where several amplifiers are used in a system. Chassis includes gain control, fuse and barrier terminations. As this amplifier is also a superb remote microphone amplifier, a knock-out for a Cannon XL3-13 connector is provided on one side. Mounts nicely in base of turntable cabinet such as the CAB-6 or CAB-8, or on back of a standard 19" x 7" rack panel. For complete description, see page 170.

ORDERING INFORMATION

All-purpose amplifier complete with tubes	M-5530
Spare 100% tube kit for above	TK-280

CUE — STA-LEVEL PATCH CABINET



Here are the three most used control room accessories packaged in a neat cabinet for wall or desk mounting. Top unit is the Gates Uni-Que cueing amplifier with inbuilt loudspeaker and 10-position input switch as described on Page 161. Center unit is the famous "Sta-Level" to provide constant program level to the transmitter line and listed on Page 156. The double jack panel will accommodate those extra circuits that are part of every broadcasting operation. Cabinet size: 20¹/₂" wide, 11³/₄" high and 15" deep. Finish is in medium gloss gray.

ORDERING INFORMATION

Cue — Sta-Level Patch Cabinet, with tubes	M-5635
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SPOT TAPE RECORDER

Model ST-101



101 announcements, jingles, themes, station breaks, featurettes and any other program content, up to 90 seconds duration each, including music of the highest broadcast standards — all on one tape 13" wide. Move the index lever to the spot your log calls for, push the start button and you are airing announcements that are flawless by reason of advanced rehearsal, multiple voices, background effects and themes. When complete, the tape automatically reverses and then cues up for split-second airing of the next spot. Erase any track not needed and record a new one as schedules change. The adjacent tracks are not affected.

"Spot Tape" sells for your customers and becomes a major business builder for any broadcasting station, radio or TV. The alert program director will be quick to recognize the scores of new broadcasting methods possible with Spot Tape, otherwise impossible except with the entire capable announcing staff on duty from sign-on to sign-off. All day long, Spot Tape is selling for you and your customers through highest level programming. While Spot Tape is operating, your production staff is carefully

planning new and better ways for tomorrow's or next week's presentation.

"Spot Tape" is a Gates exclusive and patents are pending.

Cueing is no problem with the Spot Tape Recorder, as it is done for you. Logging is simplified, and small tape packages or cartridges are not cluttering the control room. To play a spot, you simply move the indexing lever to any one of the 101 tracks, then push the Start button either direct or by remote control.

The Spot Tape index scale is graduated into major divisions of one through ten. Each division is further subdivided into letters "A" through "K". These scale divisions assure easy program logging and the control room engineer has a simple timetable to follow. As an example, we might have a program log reading: First National Bank #4H. The operator moves the pointer to 4H and the spot is ready to be played.

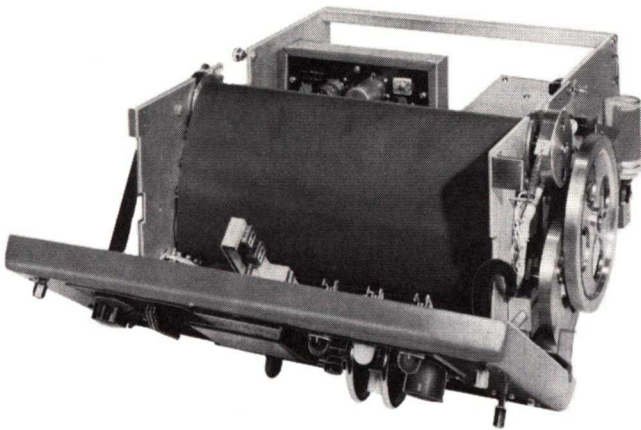
The automatic cueing and rewind facilities incorporated

ST-101 SPOT TAPE RECORDER

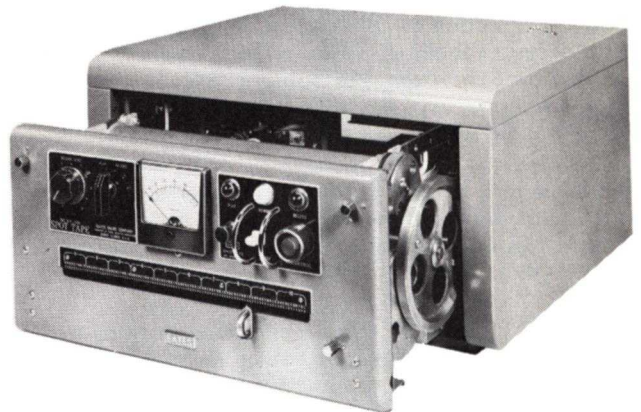
in Spot Tape go into action when the 90 second limit of tape travel is reached on any given track. At this 90 second interval, photoelectric cell control reverses the drive motor and rapid rewind takes place. Automatic rewind of the full tape is accomplished in 22 seconds. A 60 second announcement can be rewound in 15 seconds, a 30 second spot in 8 seconds by inserting the manual rewind switch. Manual rewind is possible at any time during the limit of tape travel. The manual rewind switch is located on the front panel and on the remote control unit. At the limit of tape reversal, a second photoelectric cell control reverses the drive motor and stops the tape movement. The same precise starting point is available for each of the 101 separate announcements.

The Gates Spot Tape Recorder is designed to be mounted in a standard relay rack, or in a cabinet for table mounting. The cabinet mounting size is 10" x 20" x 20" and weighs 60 pounds. The rack mounted unit requires 8 $\frac{3}{4}$ " of rack space, depth is 16 $\frac{1}{2}$ ", and weighs 47 pounds. A rack mounting shelf is supplied with each unit. The unit then slides in and out of the cabinet or rack similar to a filing cabinet drawer.

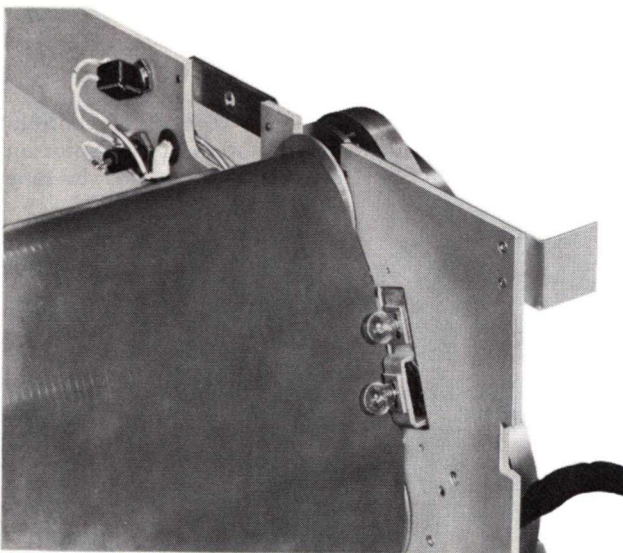
Spot Tape Recorder is ready to operate when received. The unit may be connected to the station console in any convenient manner. The output level is approximately -20 dbm — the input level is for either microphone or bridging.



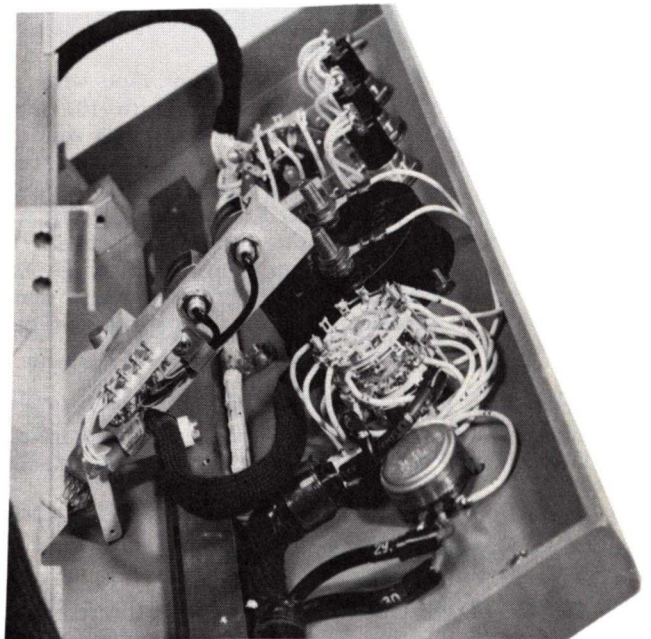
Front panel open and top off showing tape and amplifier. Top panel removes and front hinges down easily for complete accessibility to major components.



Recorder can be pulled partially out of cabinet for quick spot checking and maintenance.



Through transparent slits in tape, special lamps and photocell arrangement control stop, cue and rewind of tape.



Back view of front panel showing how main components can be reached quickly and easily.

ST-101 SPOT TAPE RECORDER

GENERAL OPERATION

Actual operation is nearly identical to any professional tape recorder. For recording or playback, the few simple controls on Spot Tape are properly set, the index lever moved to the spot to be either recorded or played back and the rest is quite the same as broadcasters are well familiar with. Indicator lights for all functions assure the operator he is correct.

As the input is for either a microphone or bridging across a 500/600 line, recording through the station's audio system or by direct microphone input permits dubbing, filter effects, themes, etc., to be recorded on Spot Tape. For straight voice announcements, the microphone may be connected direct or through the station's audio system, as desired.

Spot Tape may be used in near proximity to an AM transmitter with only nominal precautions. During the year of research, 5KW FM transmitters were frequently tested within a short distance of Spot Tape.

MODE OF OPERATION: Broadcasting stations will find many applications that could not be mentioned herein because of lack of space. Spot Tape is not automation but a method of producing the best your staff has to offer through planned, well-thought-out announcements. Once recorded, the station is then always offering the best, regardless of the time of day or the changing moods that affect announcers just the same as executives.

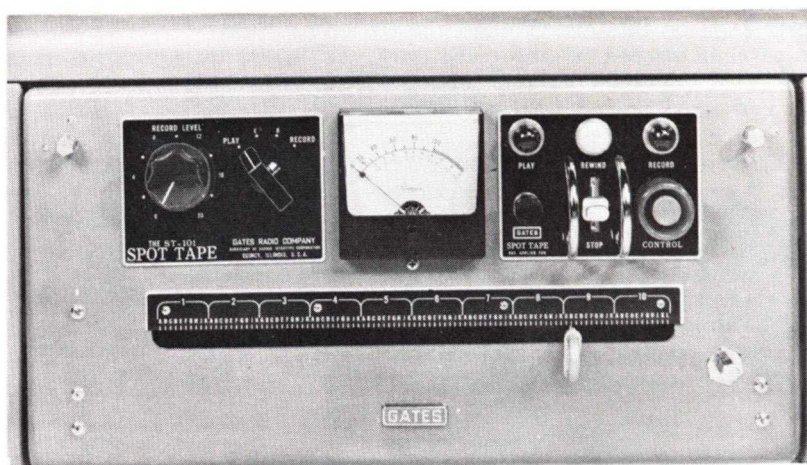
Spot Tape eliminates the long continuous tape with the complex cueing problem and replaces it with 101 tapes all side by side and on one tape 13" wide. The result is immediate identification of the spot announcement. Many stations reserve a group of spots for so-called standards. One station gave the weather each day at noon. As it was July, he decided the temperature would be between 80 and 90 and reserved all of group 8 on the index for this spot, with the temperature following, or 8E was a temperature of 85. — In short, with Spot Tape, the possibilities are almost limitless.

OTHER USES: For paging, air lines in calling flights, bus and rail terminals, and many other similar services, Spot Tape offers a new and improved progressive system.

OPERATING CONTROLS

RECORD VOLUME CONTROL: Controls the recording level and has no function in the playback mode.

FUNCTION SWITCH: When the switch is in "Play" position, it is only necessary to select the spot to be played



and push the **START** button. Position 2 of the function switch is for measuring erase current, as indicated on the VU meter, and Position 3 is for measuring bias current. Position 4 (record) places Spot Tape in condition for recording and also operating the erase head which precedes the recording head.

PLAY START SWITCH: The "Play" pushbutton starts Spot Tape for playback only and the associated pilot light above this switch indicates this function.

RECORD "START" PUSHBUTTON starts the tape for recording only. This switch interlocks with the record position on the function switch to the left of the meter. A guard is also provided to prevent accidental operation of the record pushbutton.

The remote control unit duplicates all functions of the operations panel.

"STOP-REWIND" KEY SWITCH: when to "Rewind", the tape is reversed and brought to original starting position. This function permits quick recycling in case of a very short spot where the operator cannot wait for full run out of the tape. It is also used for editing. The bottom position "Stop" will stop forward motion at any point on the tape. When in the center position (normal), the tape is running forward.

VU METER: Reads recording level as the main function but also indicates bias and erase current (see function switch above). The VU meter does not indicate in the playback cycle.

MUTING: During the rewind and cue up cycles, the output of the playback amplifier is automatically muted through self-contained relays.

REMOTE CONTROL: This extra unit duplicates all start, stop, rewind and record switching functions on Spot Tape. Though the basic design requires Spot Tape to be near the operating control point, the remote control unit permits placing Spot Tape on a roll-away table or at a more convenient location in the control room.

ST-101 SPOT TAPE RECORDER

SPECIFICATIONS

TIME CAPACITY: 101 separate tracks, each 90 seconds or less. Double or triple spotting on one track adds to the practical capacity.

TAPE SPEED: $5\frac{1}{4}$ inch/second.

RESPONSE: 50-8000 cycles ± 2 db.

NOISE: 45 db. or better below -20 dbm output.

DISTORTION: 2% or better at normal recording level.

WOW OR FLUTTER: 0.35% or lower.

WIDTH OF TAPE: 13.000 ± 0.002 ".

BIAS FREQUENCY: 60 Kc.

INPUT IMPEDANCE: 30/50-150/250 ohms at -60 dbm. (microphone) 10,000 ohms at -35 dbm. (bridging 500/600 ohms).

CUEING CAPACITY: ± 0.25 inch or ± 0.05 second.

OUTPUT LEVEL: -20 dbm.

OUTPUT IMPEDANCE: 150/250-500/600 ohms.

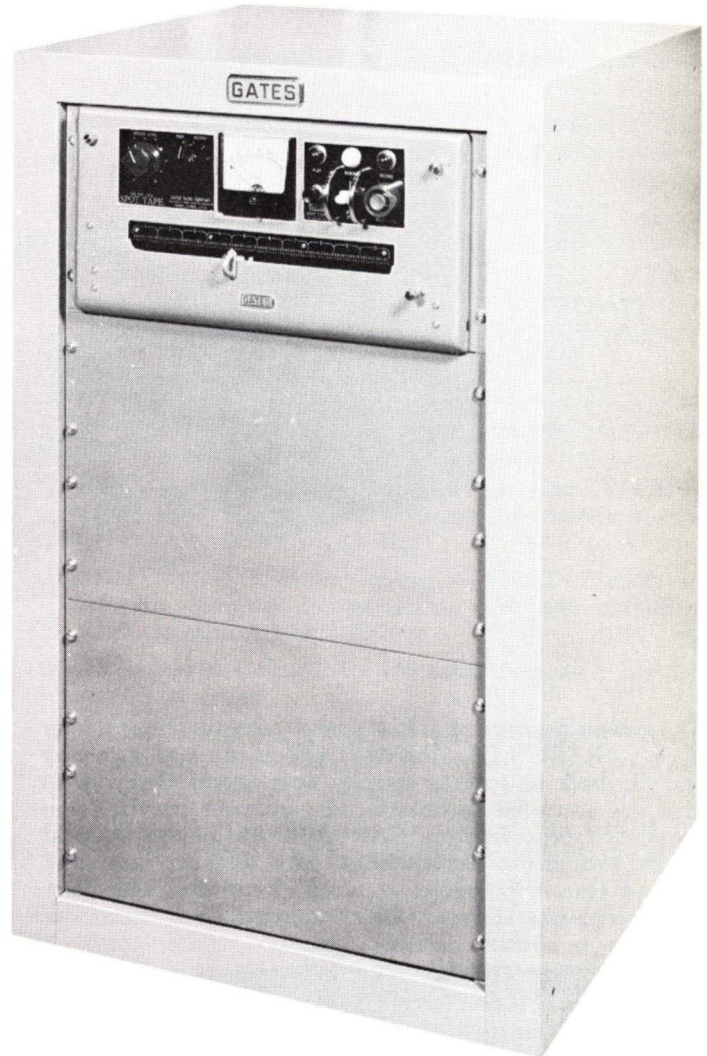
TUBES: (3) EF-86, (2) 12AX7, (1) 12AU7. All rectifiers are dry type silicon.

POWER: 115 volts, 60 cycles, 100 watts.

DIMENSIONS: (rack model) 19" wide, $8\frac{3}{4}$ " high, $16\frac{1}{2}$ " deep.
(cabinet model) 20" wide, 10" high, 20" deep.

WEIGHT: (rack model) 47 lbs.
(cabinet model) 60 lbs.

CUBAGE: 6 (packed).



GATES SPOT TAPE RECORDER has been designed for both desk and rack mounting.



SPOT TAPE REMOTE CONTROL UNIT

ORDERING INFORMATION

Gates ST-101 Spot Tape with tubes and one roll of tape installed	M-5735
100% spare tube complement	TK-351
Extra tape roll	M-5840

COMMENT: Exhaustive tests operated Spot Tape for 18,000 continuous cycles without turn off and leaving tape playback head on same track with no adverse effects on tape life or quality. Tapes may be replaced in about 15 minutes time if need be, but routine exchange of tapes is not needed or recommended. Mylar tape is used exclusively for long life and reliability.

Cartritape



The newest member of Gates' complete programming family is CARTRITAPE. CARTRITAPE is the tape transport and playback unit of an entirely new system, designed to give the advanced broadcaster the ultimate benefit from magnetic tape cartridges. CARTRITAPE quality is equal to first rate reel-to-reel machines. Its automatic cueing and starting feature is second to none. Recording and playback are accomplished with simplicity, and functional operation is positive and fast.

While CARTRITAPE will perform nearly any programming duty, it is especially suited for reproduction of announcements, production aids, themes and the "top fifty" of the week. It is an excellent partner for the famous Spot Tape, where even greater facilities are desired.

Several CARTRITAPE units may be cross-connected to give completely automatic programming segments. This is the answer for those who desire interspersed automatic and live or manual programming from the same equipment. One switch will convert a CARTRITAPE system from manual to automatic (and vice versa) operation in a split second. Material may be interchanged rapidly to build up a variety of automatic programs without the necessity of recording the entire show each time.

OPERATION AND FEATURES

Any number of commercials, themes, etc. may be sequentially recorded on a single cartridge until the tape is completely filled. Segments can be as small as a second or as long as 46 minutes. Three basic cartridge sizes are available to handle the desired playing time.

The system includes, in addition to CARTRITAPE, the Recording Amplifier, the four channel Switcher, the Remote Panel and many other accessory items. The Recording Amplifier plugs into any CARTRITAPE unit and relay operation permits recording or playback without reconnection each time. The Cue Control tone is recorded on one half of the tape for a brief time just before the program is recorded on the other half. This control tone burst stops the tape at precisely the right time, before the announcement, to give optimum split-second cueing with no trace of wow. If it is attempted to record past the cue tone (more time than is available on the cartridge) the machine will stop, even in the recording cycle — showing the necessity of a larger tape or shorter program. Thus, programming errors are automatically rejected without aural review.

Two solenoids and sequential switching are used to give optimum performance in CARTRITAPE. When the cartridge is inserted a switch is triggered to: energize the "ready" solenoid — which swings the pinch roller through 99° of its 102° arc, start the motor and light the "ready" light. When the local, remote or automatic "start" switch is pushed: The second solenoid swings the pinch roller through the last 3° of its arc, the "run" light is energized and the tape is instantly running at full speed.

This operation allows the unit to be stopped and started between syllables without noticeable wow. It also allows consistently tighter cueing on the start of any programming segment than can be obtained with any other type of broadcasting equipment.

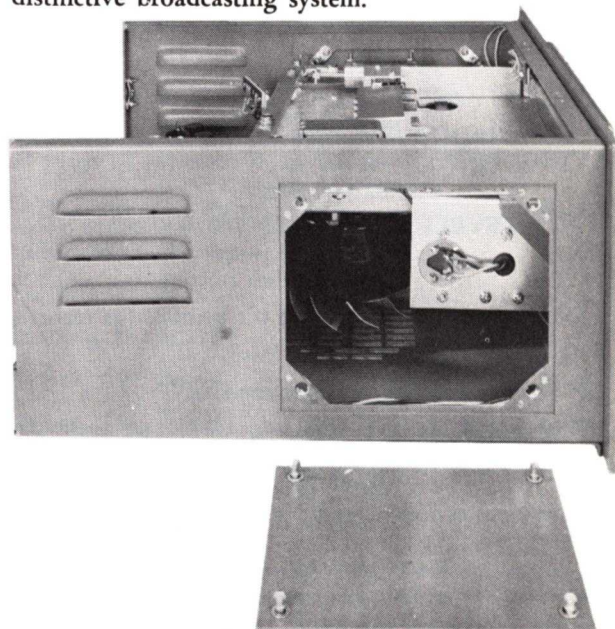
Cartritape



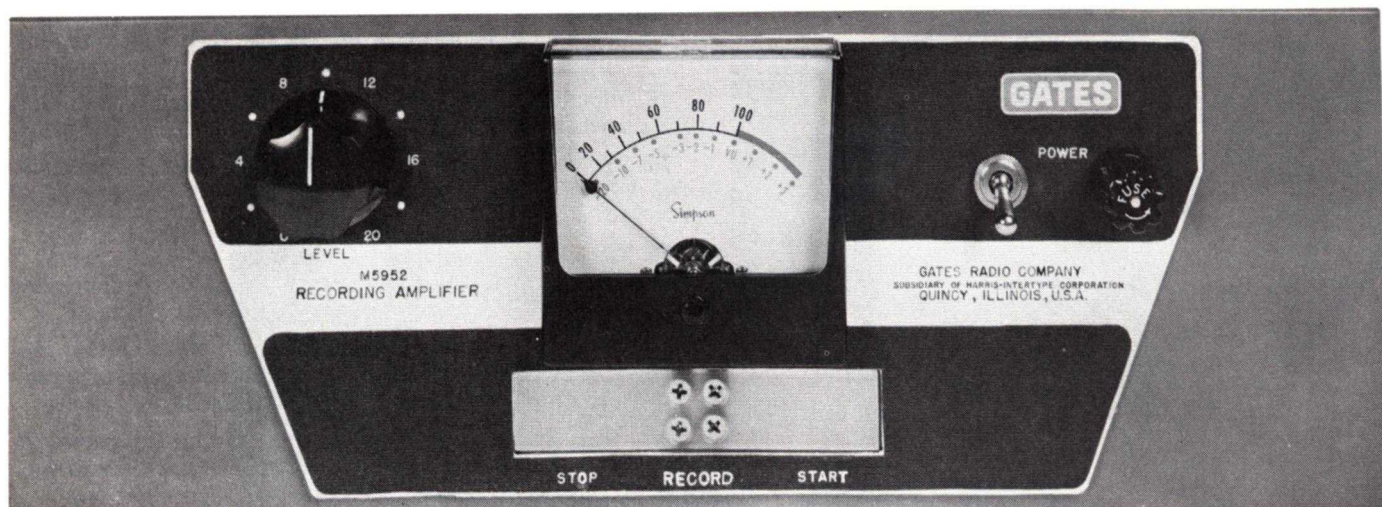
FEATURES

1. Programming — from one syllable to 46 minutes, instantly available.
2. Quality — similar to any good grade professional tape equipment.
3. Operation — extremely simple in either recording or playback.
4. Dependability — simple, direct and trouble-free with only minimum maintenance.
5. Quick Change — throw one switch to instantly convert from manual to automatic operation.
6. Cueing — accurate and negligible dead air time.
7. Versatility — infinite numbers of programs may be built around the same recorded cartridges.
8. Complete System — designed to give the broadcaster all the desired facilities for modern broadcasting.
9. Motor — runs only when cartridge is inserted, saving useless wear and heat.
10. Program Material — completely enclosed in plastic or metal cartridges, as desired.
11. Protected — no spilling or breaking of tape due to handling or storage.
12. Instant use — no threading or manual or aural cueing required.
13. No Rewind — at the end of the tape the cartridges are cued up and ready to play again, immediately or after storage.
14. No Speed Change Errors — single $7\frac{1}{2}$ " IPS, tape speed, no errors due to running cartridges at the wrong speed.
15. Remote Operation — without modification. Connect remote switching to proper plug terminals.
16. Illuminated Push Button — operation to show that power is on and the exact function status.

17. No Limit — to the number of announcements or programming segments available for each and every machine.
18. Equalization — standard NAB recording and playback equalization.
19. No Accidental Erasures — no erase heads in the CARTRITAPE system, bulk erasing easily accomplished in seconds. Bulk eraser optional.
20. Cartridges Available — unloaded or loaded from 1 second up to 46 minutes with the standard lubricated tape.
21. Switcher — to electrically feed a CARTRITAPE into a single console circuit for limited automatic programming and conservation of console facilities.
22. Any Number of Switchers — may be connected in series to give an unlimited number of tape inputs into one console channel.
23. 19" or 15" Panels Available — in CARTRITAPE, Recording Amplifier or Switcher for standard rack or custom cabinet mounting.
24. Desk Mount Without Cabinet — CARTRITAPE enclosure designed for attractive desk top mounting without cabinet (15" panel).
25. Entirely Self-Contained — all units have self-contained power supplies.
26. Quick Disconnect Plugs — used throughout system. Interconnecting cables and motor and "run" solenoid on quick disconnect plugs.
27. Access Doors — with $\frac{1}{4}$ turn fasteners for lubrication and inspection of motor and linkage without dismantling enclosure.
28. Compatible Styling — to enhance the appearance of a distinctive broadcasting system.



The Gates Cartritape offers complete accessibility for maintenance. Each side slips off with quick fastener screws.

GATES**Cartrtape**

Shown above is the recording amplifier, which plugs into any CARTRITAPE unit. Relay operation permits recording or playback without reconnection each time.

SPECIFICATIONS

M5944 CARTRITAPE Playback Unit

FREQUENCY RESPONSE: Standard N A B playback curve, ± 2 db, 50 to 12,000 CPS., @ 7.5 IPS.

DISTORTION: 2% or less @ normal recording level.

NOISE: 60 db or lower, below tape saturation level, 50 db or lower, below normal recording level.

WOW AND FLUTTER: 0.1% to 0.2% RMS.

TAPE SPEED: $7\frac{1}{2}$ " per second.

EQUALIZATION: Standard NAB playback equalization for 7.5 IPS.

PLAYING TIME: 1 second to 46 minutes in three basic cartridge sizes.

OUTPUT LEVEL: -20 dbm @ 500/600 ohms (factory connected), may be strapped for 150/250 ohm output.

CUEING ACCURACY: Within 0.1 second. (as recorded).

START TIME: 0.1 second or less.

STOP TIME: Essentially instantaneous.

POWER SOURCE: 115 volts, 60 CPS. (50 cycle model available on special order at slightly higher price.)

POWER CONSUMPTION: 35 watts in the "ready" position.
125 watts in the "Run" position.

TUBE COMPLEMENT: (2) 12AX7, (1) EF86, (1) 2D21 and (1) 6X4.

MECHANICAL

HEIGHT: 7 inch Rack or custom Cabinet mounting.

WIDTH: 19 inch Rack or 15 inch custom Cabinet mounting.

DEPTH: 13 inches behind panel, excluding plugs.
 $14\frac{3}{4}$ inches overall.

THREE STANDARD MOUNTINGS:
Standard 19 inch Rack,
Custom 15 inch Cabinet,
Desk top, with or without cabinet.

WEIGHT: Net 26 lbs., packed (domestic) 49 lbs., cube 5.

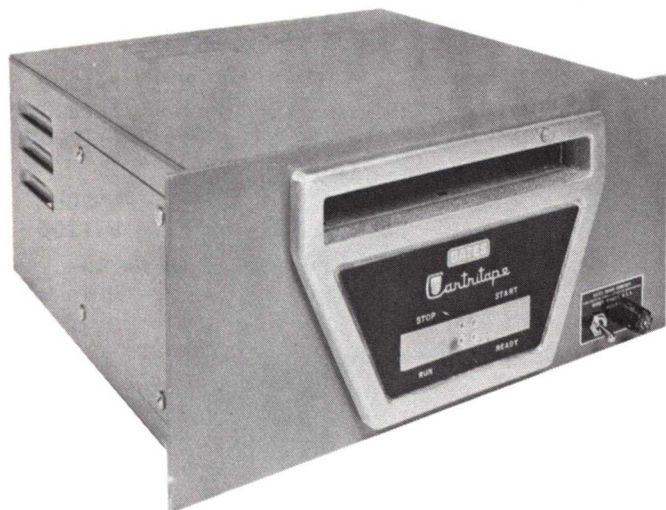
AUXILIARY: Remote Start
Remote Stop
Remote Record Start
Remote Record Stop
Remote Cue Interlock
Remote Record Interlock
Synchronized Start Circuit
Synchronized Cue Controlled Stop Circuit
Synchronized Automatic Sequential Start Circuit.

M5952 RECORDING AMPLIFIER

FREQUENCY RESPONSE: Standard N A B recording curve, ± 2 db, 50 to 12,000 CPS. @ 7.5 IPS.

DISTORTION: 0.5% or less @ normal recording level.

Cartritape



POWER: 115 volts, 50/60 CPS., 7 watts.

RELAYS: Telephone type (type "J" or equivalent).

MECHANICAL

HEIGHT: 3½ inch Rack or custom Cabinet mounting.

WIDTH: 19 inch Rack or 15 inch custom Cabinet mounting.

DEPTH: 3½ inches behind panel, excluding plugs.
5¼ inches overall.

PANEL: Hinged and secured with ¼ turn fastener to permit quick access to dust protected relay contacts.

WEIGHT: Net 6 lbs., packed (domestic) 10 lbs., cubage 1.

NOISE: —120 dbm or lower, relative input noise with microphone level into matching input circuit.

EQUALIZATION: Standard NAB recording curve for 7½ inches per second.

INPUT LEVEL: —50 to —70 dbm at 30/50 or 150/250 ohms.
—35 to +8 dbm at 10,000 ohms bridging. (both balanced or unbalanced)

CUEING ACCURACY: Within 0.1 second, (as recorded)

POWER SOURCE: 115 volts, 50/60 cycles per second.

POWER CONSUMPTION: 25 watts.

TUBE COMPLEMENT: (2) EF86, (1) 12AX7, (1) 12AU7 and (1) 6X4.

MECHANICAL

HEIGHT: 7 inch Rack or custom Cabinet mounting.

WIDTH: 19 inch Rack or 15 inch custom mounting.

DEPTH: 11 inches behind panel, excluding plugs.
12¾ inches overall.

WEIGHT: Net 12 lbs., packed (domestic) 27 lbs., cubage 3.

M-5953 SWITCHER

INPUT CHANNELS: Four, 500/600 ohms (factory connected). 150/250 ohms also possible by changing load resistor.

CROSSTALK: More than 65 db below normal recording level.

SWITCHING TIME: 0.02 seconds or less.

M-5960 REMOTE PANEL

SWITCH CONTROLS: 4 CARTRITAPE Playback units or 3 CARTRITAPE playback units and 1 recording unit. Panel contains 4 "Start" push-buttons and "Record" and "Off" push-buttons.

HEIGHT: 3¾". The M5965 mounting box is 3⅞".

WIDTH: 6". The M5965 mounting box is 6¼".

DEPTH: 2¾". The M5965 mounting box is 3¼".

MOUNTING CENTERS: 2¾" by 5¼".

CONNECTIONS: Quick Disconnect Plug.

ORDERING INFORMATION

CARTRITAPE, 19" Panel	M-5944
CARTRITAPE, 15" Panel	M-5944A
Recording Panel, 19"	M-5952
Recording Panel, 15"	M-5952A
Switcher, 19" Panel	M-5953
Switcher, 15" Panel	M-5953A
Remote Panel	M-5960
Mounting Box for above Panel	M-5965

NOTE: Suggested basic CARTRITAPE system would include (3) M-5944 (A) CARTRITAPE units, (1) M-5952 (A) Recording Panel, (1) M-5953 (A) Switcher, (1) M-5960 Remote Panel, and (1) M-5965 box for remote panel.

AUTOMATIC TAPE CARTRIDGES

The Fidelipac automatic Tape cartridges featured here are continuous, self-contained, single reel tape cartridges which operate on an endless loop principle. The tape is pulled from the center and after passing the playing or recording head is automatically rewound on the outside of the reel contained in the cartridge. This process goes on continuously until the machine is stopped or the cartridge is removed. Individual or multiple messages or musical selections, of varying length, will be repeated, limited only by the length of tape in the magazine. The tape is completely contained in the plastic magazine and is never touched by the operator. The cartridge is merely inserted in the Cartritape and is in operation.

ADVANTAGES

- No Threading — thus eliminates difficulty of threading tape on take-up reel; also prevents twists and kinks.
- No Rewinding — preventing excess slack and spillage — eliminates complicated handling.
- Eliminates tape breakage due to tension differences in supply and take-up reels; eliminates nicks, cut and creases that cause tape breakage.
- Simplifies storage of cartridges which are designed to stack one on top of another in a self-storing unit.
- Minimizes damage from dust and grit thereby extending tape life.
- Ease of handling.
- The applications are virtually unlimited.

STANDARD MAGAZINES

- MODEL 300 SIZE: $5\frac{1}{8}" \times 4" \times \frac{7}{8}"$ contains 300 feet of single coated Mylar* tape.
- MODEL 600 SIZE: $7" \times 6" \times \frac{7}{8}"$ contains 600 feet of single coated Mylar* tape.
- MODEL 1200 SIZE: $8\frac{3}{4}" \times 7\frac{1}{2}" \times \frac{7}{8}"$ contains 1200 feet of single coated Mylar* tape.
- LIFE EXPECTANCY: The Fidelipac Tape Cartridges have been completely laboratory and field tested and a life of upwards of 3000 hours of operation may be expected.

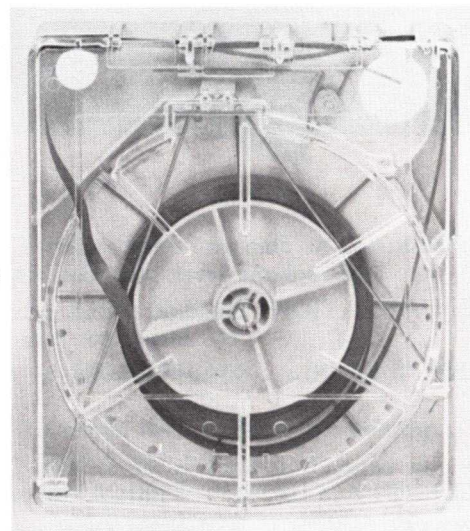
*DuPont Trademark

ORDERING INFORMATION

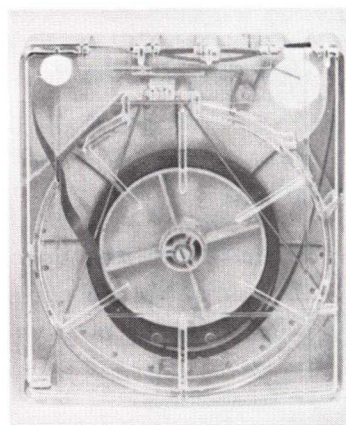
TIME	300 Series	MODEL
Empty		F-300
40 Seconds		F-300A
70 Seconds		F-300B
100 Seconds		F-300C
3½ Minutes		F-300D
5½ Minutes		F-300E
11 Minutes		F-300G

TIME	600 Series	MODEL
Empty		F-600
16 Minutes		F-600H
TIME	1200 Series	MODEL
Empty		F-1200
31 Minutes		F-1200J
45 Minutes		F-1200K
TIME	VIKING CARTRIDGES	MODEL
Empty		V-300
Empty		V-1200

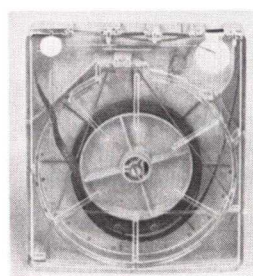
(Transparent cover on Fidelipac cartridges shown for illustration only. Models 600 and 1200 supplied with the new blue opaque covers only.)



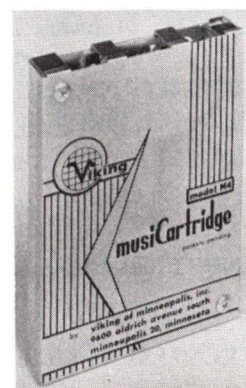
MODEL 1200



MODEL 600

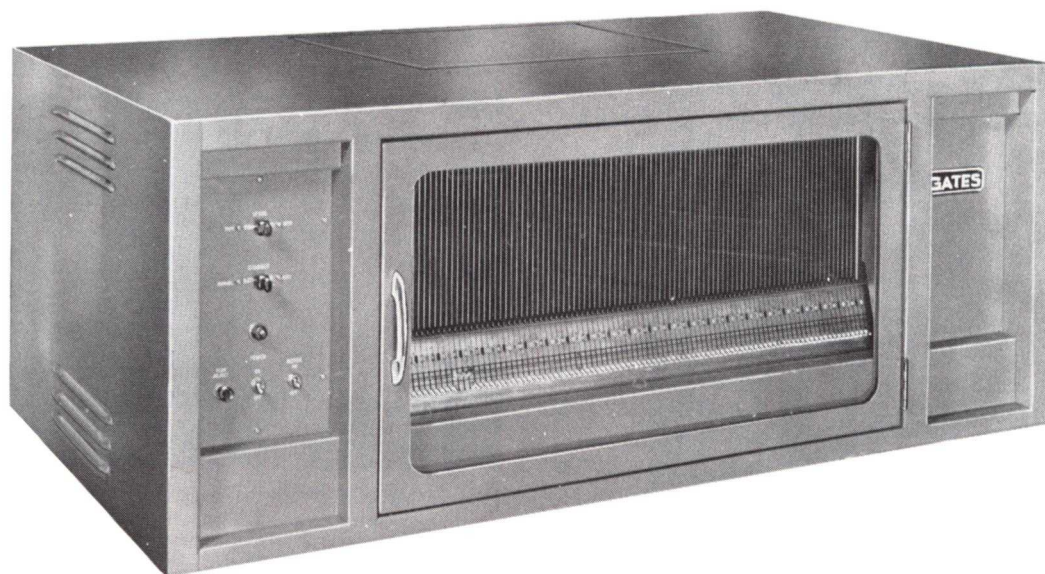


MODEL 300



VIKING

"AUTO-TRANS" AUTOMATIC PROGRAMMING EQUIPMENT



"Auto-Trans" is the automatic transcription turntable equipment for 45 RPM records that requires only the pushing of a button to start the next record. Capacity is up to 100 double-faced records, or nearly 10 hours.

"Auto-Trans" consists of a 100-record capacity (200 selection) automatic changer modified with an ingenious relay system to omit dead air time. When played in sequence, time spacing is less than 10 seconds between records or just enough time for the shortest announcement. — Where records are selected at random, the time between discs is slightly greater. In all instances, time between discs is being consumed by announcements and the next record does not start until the announcer presses the button.

Standard equipment includes the record changer mounted in steel case, relay control system for start-stop and automatic cueing, individual record selector switch for either side of the record and remote control operating switch box. A 4-stage equalized preamplifier is inbuilt. Equalization is to standard NAB 45 RPM RIAA curve, old NAB and a filter position. Output impedance is 150/600 ohms. Diamond stylus is provided. No accessories are required other than the usual studio equipment.

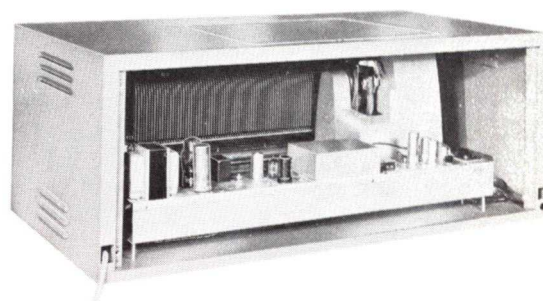
SPECIFICATIONS

SIZE: 38½" wide, 17½" deep, 16¼" high (front door closed).
 FINISH: Medium gloss gray.
 OUTPUT LEVEL: —20 dbm.
 OUTPUT IMPEDANCE: 150/600 ohms.
 POWER: 115 volts, 60 cycles.
 RESPONSE: Standard NAB curve for 45 RPM.
 NOISE: 55 db or better below —20 dbm (preamplifier)*.
 DISTORTION: .5% or less 50-15,000 cycles at —20 dbm output.

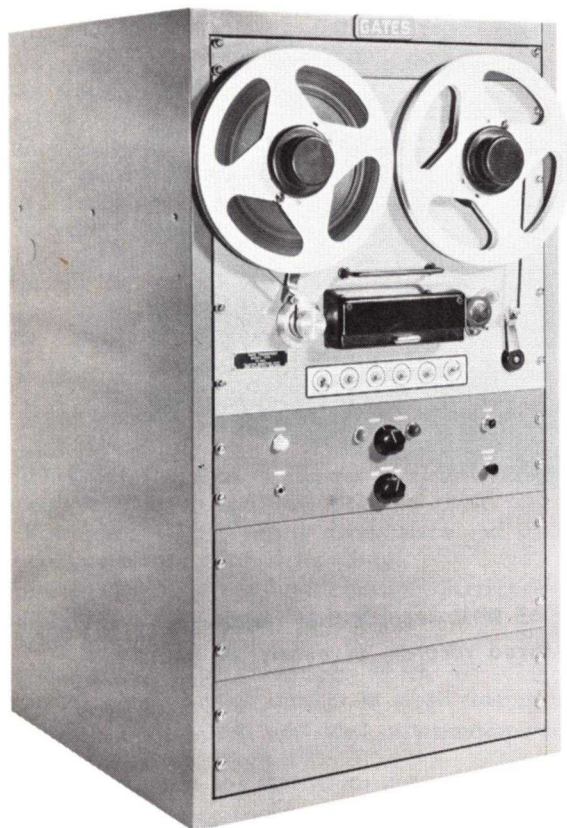
* Stylus or record condition will always affect performance and specifications are electrical conditions only.

ORDERING INFORMATION

"Auto-Trans" complete with remote control station and ready to use M-5452



"NITE-WATCH" AUTOMATIC PROGRAMMING SYSTEM



ABOVE: Tape and Control Cabinet

RIGHT: Production Unit

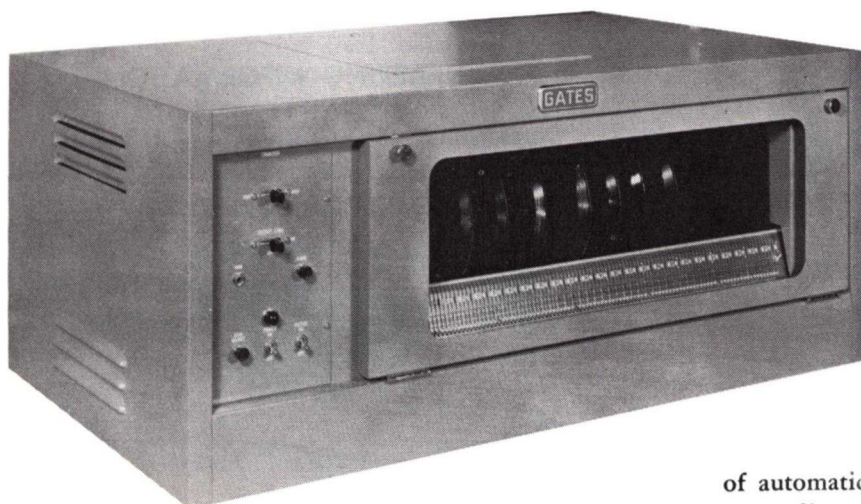
BELOW: 100 record automatic cueing transcription equipment.



Nite-watch consists of three basic equipments supplied as a complete package: (1) production console, (2) tape control unit, and (3) the 100 record (up to 200 plays, both sides) 45 RPM automatic cueing transcription changer. Announcements are made consecutively without intervening records. In the playback, announcements are automatically separated between record plays. Full editing, sequence record selection and dubbing facilities are incorporated.

In "Nite-watch" is a top grade tape recorder/playback mechanism of advanced professional design, obviously necessary for the exacting demands of automatic programming. When not in use for automatic programming, this recorder may be used for standard record/playback to full NAB standards.

If desired, a simple switch control unit may be purchased as an optional accessory. In this way, the 100 record unit becomes a fully automatic transcription equipment listed as "Auto-Trans" in this catalog.



3 in 1 System

Here is the 3 in 1 system — automatic programming — professional tape recording and — automatic transcription equipment. Here is a system that may be used all day long for the major service needs of professional quality tape recording and the complete handling of 45 RPM transcription needs plus — the progressiveness of automatic programming.

Operation of "Nite-watch" is by no means complicated. Actually, it is more simple than a control board operation. Continual programming up to as much as six hours is easily possible. The amount of automatic programming is at the discretion of the program director.

"NITE-WATCH" AUTOMATIC PROGRAMMING SYSTEM

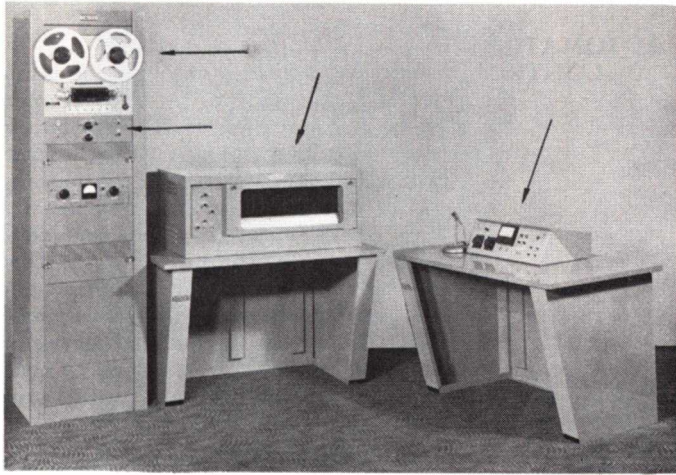


Illustration of "Nite-watch" where tape transport and control amplifier are mounted in broadcaster's rack cabinet. Arrows indicate equipment supplied as standard and balance is for illustrative purposes.

Taking a 2-hour program quickly illustrates operating procedure. Announcements are ready for the 2-hour show. The production unit has familiar controls, microphone mixer, turntable mixer for dubbing in jingles, etc., standard VU meter and headphone jacks. All announcements are made in sequence. After the first announcement, the announcer presses a button on the production unit that impresses an inaudible tone on the tape. He then continues with the second announcement, etc. In the playback procedure the tape is reversed to the starting point of the first announcement. After each announcement the tone stops the tape and starts the record, which automatically cues up during the announce period so negligible dead air will exist. Tapes may be instantly stopped, cued and reversed to correct announcing errors. Theme music or transcribed spots may be dubbed on the control tape with assured equal quality to that of the records.

In the above brief dry run we find that a 2-hour program may have ten 1-minute announcements, 22 average 20-second announcements and 34 average 3-minute discs, totaling 119 minutes, yet using 17 minutes of actual announcing time. Double this and 4 hours would use 34 minutes of announcing time, etc. In practice, the announce time could take a little longer as the an-

nouncer need not talk continually. He may stop to study his next script or cue up a jingle to be dubbed. Much more important than the time saved is the opportunity for topflight programming, multiple voices without increased time and the ability to recall "fluffs" before they reach the air.

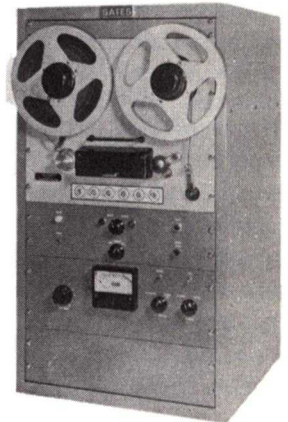
The tape transport unit may be used for all modes of tape recording and playback when used with the production unit. Where it is desired to have the tape recorder entirely independent of the production unit, when used strictly as a tape recorder, the M5664 optional recording panel may be purchased.

In the 100 record changer, diamond styli and a special equalized preamplifier assure transmission characteristics to the correct broadcast audio curve. An ingenious relay system automatically cues to within 2 seconds of sound during the announce cycle. Minimum cue time from one record to the adjacent record requires a 10-second announcement. Segue is possible (no announcements between records) with about 8 seconds dead air between plays. — By purchasing the inexpensive optional M5665 remote control switcher, the changer may be operated identically to the "Auto-Trans."

It is recognized that some questions will occur to interested broadcasters that may not be fully answered on these pages. Any Gates sales engineer or the Gates — Quincy, Illinois Engineering Department will happily discuss these verbally or by response to your mail request.

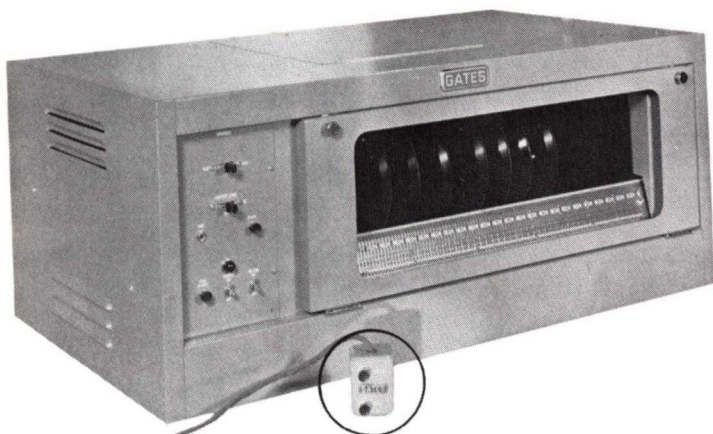


M-5664 recorder panel is optional equipment where the purchaser desires a completely independent tape recorder/playback unit which may be used for highest standard tape recording at any time automatic programming is not in use. This unit is not mandatory as tape recording may always be done through the M-5661 production control unit.



Above illustrates the M-5664 recorder panel mounted below the tape transport and amplifier control panel.

"NITE-WATCH" AUTOMATIC PROGRAMMING SYSTEM



By adding the optional M-5665 switch control box, the changer unit may be used as a complete remote operated "Auto-Trans."

SPECIFICATIONS

Production Unit M-5661

AUDIO INPUT: Dual mixing channels. TT or line channel 150/600 ohms at -20 dbm. Microphone channel 50/150 ohms at -60 dbm.

AMPLIFIER: Cathode follower type for direct connection to tape recording amplifier.

POWER SUPPLY: Self-contained, fully regulated.

HEADPHONE JACKS: Two provided. One connects to output of production unit amplifier and for cueing the turntable. The other connects to the tape playback amplifier in the M-5662 control unit. This permits monitoring tape while recording, or checking and editing tape after announcement is recorded. (The tape machine has both a recording and playback head — the playback head feeds into the playback amplifier at all times.)

AUTOMATION

CONTROL: Dual push-buttons: (1) for announce, dubbing, etc., and (2) for changer operation. Accompanying each push button is an indicating light. A 20 cycle wein-bridge oscillator is engaged by pushing the changer button. The tape motion lamp shows when the tape machine is running and when it is stopped. During the editing process it indicates when the tape stops at the end of a recorded tone. Complete remote switching is provided for the tape machine to assist in editing. This includes start, stop, fast forward and rewind.

SIZE: 21" wide, 7 $\frac{1}{4}$ " high, 14" deep.

Tape/Control Unit M-5662

TAPE TRANSPORT: See Page 185 for full specifications.

AMPLIFIERS: Separate record and playback.

OUTPUT IMPEDANCE: 600 ohms balanced at -20 dbm to input of station speech input system.

SWITCHING: Input tape switch, record-playback switch, changer clear switch and associated indicating lamps.

SIZE: Cabinet model — 30" high, 21 $\frac{1}{4}$ " wide, 21 $\frac{1}{4}$ " deep. Rack mount units less cabinet — 19" wide, 21" high.

Automatic Changer/Cueing Unit M-5663

CAPACITY: 100, 45 RPM records.

CUEING: 2 seconds or less to sound track.

SELECTING: Tabs below each record slot permit indexing for playing on either side or bi-passing.

CONTROLS: Motor Off-On, Scan-Reject, Clear, Manual-Automatic, Power Off-On.

RESPONSE: RIAA, NAB and cut off curve.

DISTORTION: .5% or less 50-15,000 cycles (amplifier).

RUMBLE: 35 db. or better below standard recording level.

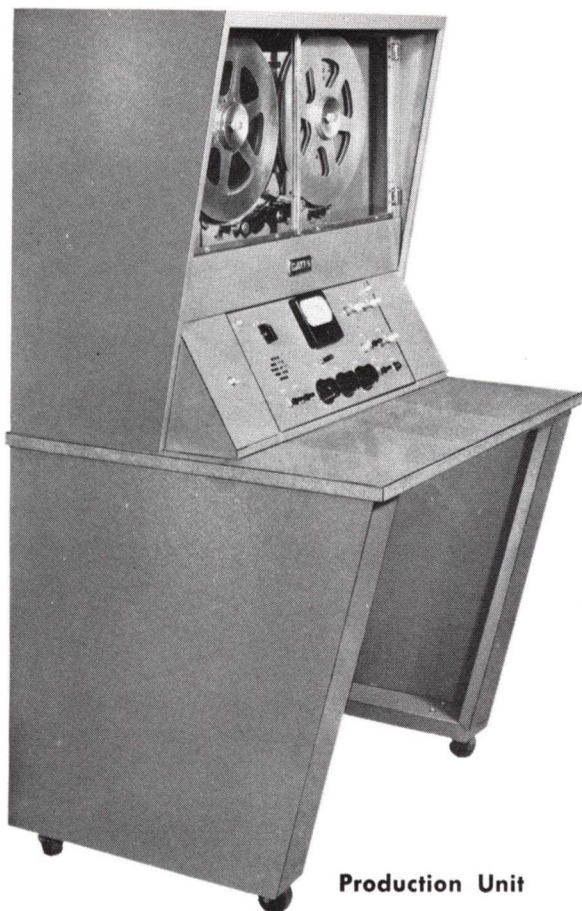
SIZE: 39" wide, 16" high, 23" deep.

POWER: All units 115 volts, 60 cycles.

ORDERING INFORMATION

"Nite-watch" complete, includes production unit, cabinet model recorder/playback and changer unit, ready to operate	M-5671
"Nite-watch" same as above but less cabinet for tape recorder and control amplifier (for your own rack cabinet)	M-5628
Recorder panel for use with tape recorder where use of M-5661 production console is not desired for straight tape recording	M-5664
Auto-Trans control switch box for using M-5663 changer as remote operated transcription equipment	M-5665

"AUTO-STATION" AUTOMATIC PROGRAMMING SYSTEM

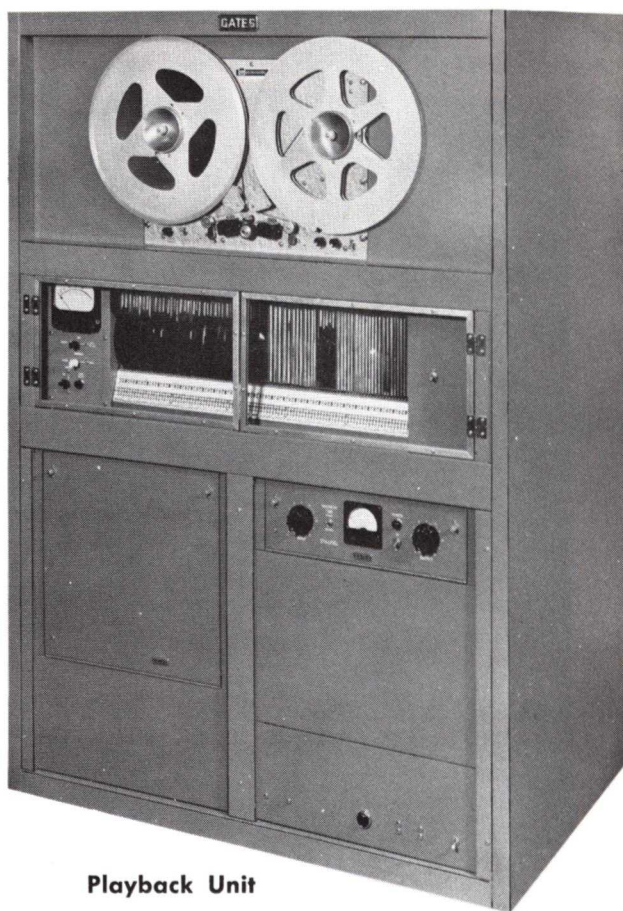


Production Unit

Two distinctly separate units comprise the complete "Auto-Station." (1) The Production Unit, and (2) The Automatic Playback Unit. These units are not connected electrically in any way. They may be in the same room or miles apart. The Production Unit, as the word implies, is used in producing the programs. It is here that hours of programming are put together in only a fraction of the time required otherwise.

The Automatic Playback Unit is employed for the actual broadcasting or the program. The master tape created on the Production Unit is moved to the Playback Unit and handled entirely automatically.

"Auto-Station" utilizes the principle of the binaural tape transport mechanism. One-half of the tape carries the sound portion and to the other half is applied the various tones which trigger the automatic operation of the Playback Unit. This method permits almost limitless automation. Sub-audible tones, limited usually to only one tone, are not used. Instead, tones in the audible range may be used in generous numbers, if need be, to operate function after function. These tones cannot be aired as they are allocated to that half of the tape not devoted to sound.



Playback Unit

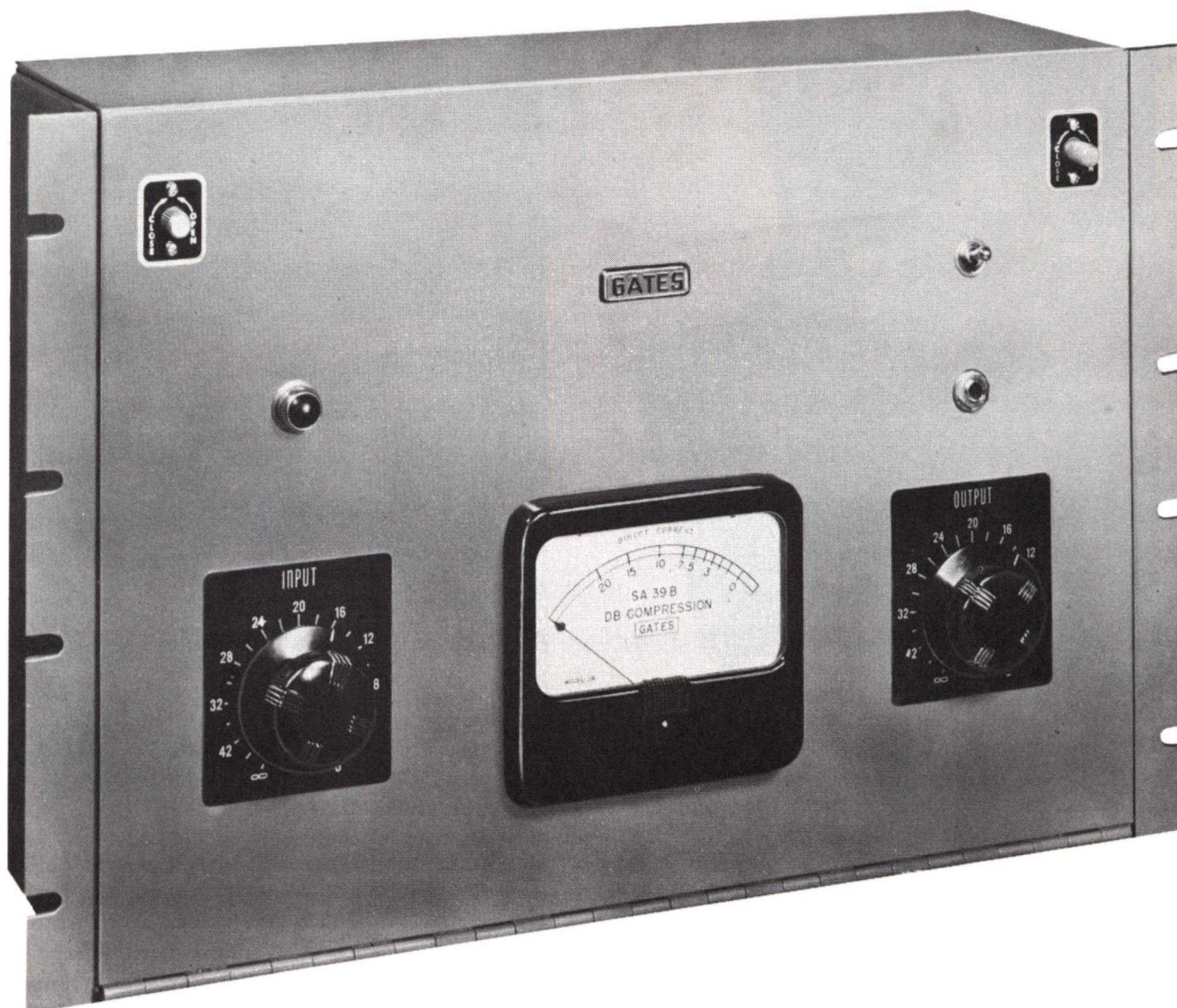
Important is that the tape only operates during the announce cycle. When any other function is performing on the Playback Unit such as a record, delayed broadcast, etc., the main tape stops. This means that one tape will handle hour after hour of programming. More important, the announcements may be all made together. For example, a one-hour show might average 17 three-minute recordings, 6 one-minute announcements and 11 fifteen-second announcements, totaling 59+ minutes, yet with "Auto-Station" only 9 of these minutes would be used by the announcer as he makes all announcements at one time. "Auto-Station" separates the announcements between records automatically. Thus, it can be seen that 90 minutes of announcing would produce 10 hours of programming. Realistically, of course, an announcer will not talk continuously for 90 minutes but double this and you still have 3 hours production time for a 10-hour broadcast. For additional details, write the audio products section, Gates Radio Company, Quincy, Illinois.

ORDERING INFORMATION

Complete "Auto-Station" including Production and Playback Units and one 4800 ft.

roll of tape M-5429

SA-39B PEAK LIMITING AMPLIFIER

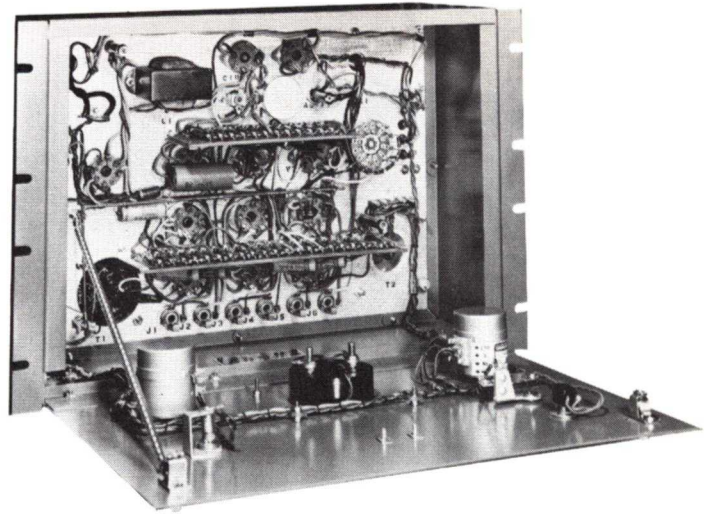
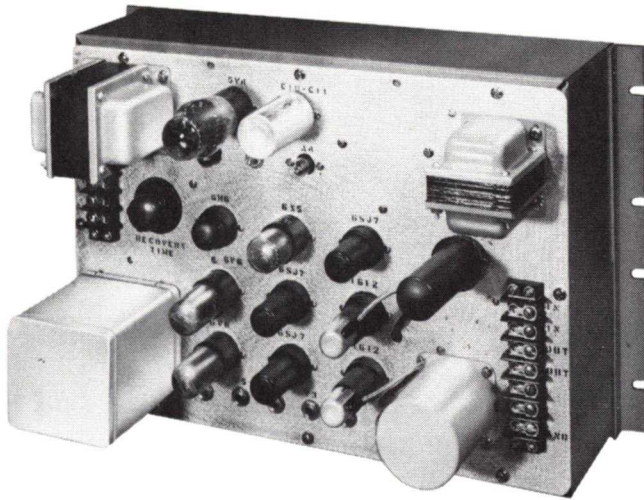


Combining fine performance standards with design emphasis on easy serviceability, the Gates SA-39B limiting amplifier is a worthy successor to the hundreds of early Gates limiters which have earned an enviable reputation for fineness.

This unusual limiter circuit was originally designed in cooperation with British Broadcasting Company engineers. Elaborations on the design have been made as the art progressed. Today's model is often considered the standard of comparison both as to smooth, fast limiting performance and very low distortion at abnormally high degrees of limiting action.

Very fast attack time, essentially instantaneous, is associated with six switch-selectable release times. In this manner the engineer may adopt the mode of operation best suited for him. Limiting action is by full wave rectification of the output voltage with the resultant negative direct current fed to the second control grid of the pushpull input stage. As the output voltage increases, the grid becomes more negative, lowering the gain of the amplifier. — Along with fast action, no added distortion is induced at compression levels as high as 20 db.

SA-39B LIMITING AMPLIFIER



Circuit design provides three push-pull stages having both input and output level control. An electronically regulated power supply incorporates 6X5, 6SJ7 and 6L6G tubes with the 5V4G cathode type rectifier. This guarantees limiter calibration over wide ranges of line voltage. — A wide scale 4" meter is calibrated in decibels of compression for direct reading.

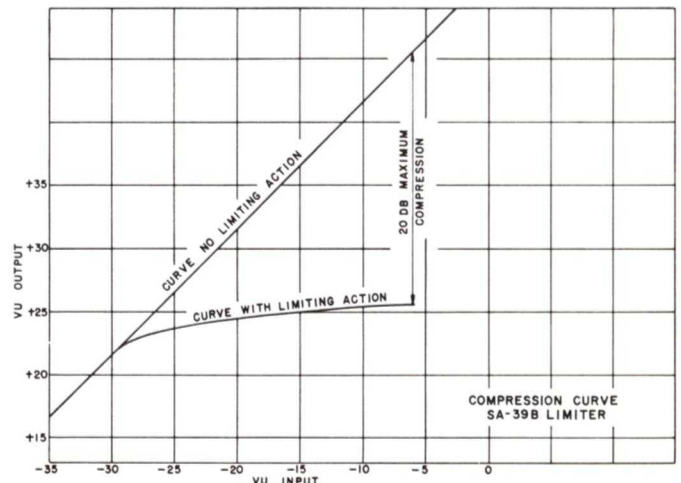
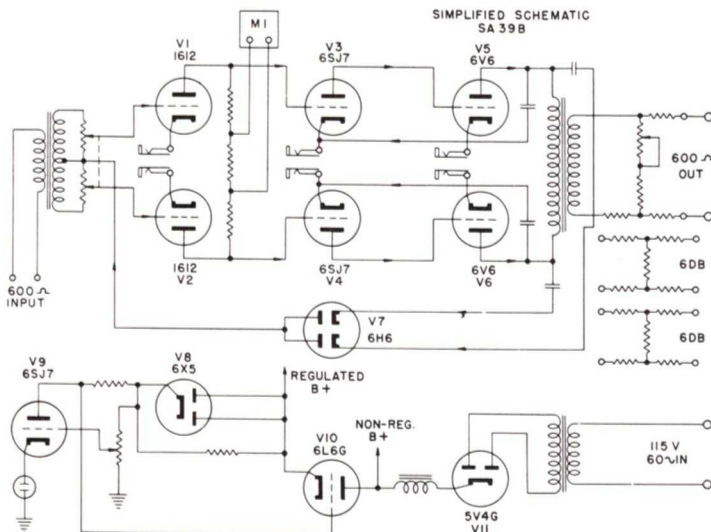
In the several illustrations herein, the ease of servicing and maintenance will be observed. Front panel hinges down to expose all under-chassis parts. Easy cleaning of the under-chassis with a bellows or small suction type cleaner assures trouble-free operation.

SPECIFICATIONS

IMPEDANCES: 500/600 ohms input and output.
 INPUT LEVEL: -20 to +20 db (adjustable by attenuator).
 OUTPUT LEVEL: +25 dbm or less (adjustable by attenuator).
 MAXIMUM GAIN: 55 db.
 AUDIO RESPONSE: 30-15,000 cycles $\pm 1\frac{1}{2}$ db.
 AUDIO DISTORTION: $1\frac{1}{2}\%$ or less 30-15,000 cycles at 20 db compression.
 NOISE: 70 db or better below any adjustable output level.
 ATTACK TIME: Essentially instant.
 RELEASE TIME: Six positions from 0.2 to 1.2 seconds.
 SIZE: 19" wide, 14" high, 9 $\frac{1}{2}$ " deep.
 FINISH: Medium gloss gray.
 DC REGULATION: ± 5 volts of main plate supply.
 POWER INPUT: 115 volts, 50/60 cycles, 90 watts.
 TUBES: (2) 1612, (2) 6V6GT, (3) 6SJ7, and one each 6H6, 6S5GT, 6Y6G and 5V4G.
 WEIGHTS: Net 36 lbs. Domestic packed 74 lbs. Export packed 96 lbs. Cubage 9 $\frac{1}{2}$ ".

ORDERING INFORMATION

Model SA-39B Limiter with tubes M-3529B
 Spare 100% tube set for above TK-150



"STA-LEVEL" AUTOMATIC PROGRAM LEVEL AMPLIFIER



Perhaps no single equipment in all of broadcasting has done so much for so little cost as the Gates "Sta-Level." The basic function is to provide constant level output. "Sta-Level" brings up the low passages as well as holding down excessive output level. The result is always higher level of transmission, the equivalent of greater signal output.

"Sta-Level" automatically adjusts for different input levels, or it differs from a peak limiting amplifier by raising level, if it is too low, and reducing level if too high. Practical and very realistic results become obvious. A few are:

(1) Psychologically, to prevent excess level, the operator will very naturally maintain lower levels. This makes the softer passages very low indeed. When "Sta-Level" is in the circuit, two important things happen: (a) output levels may be higher as they are automatically protected, and (b) the low, soft passages are automatically raised in level.

(2) The effect of (1) above is identical to turning up the volume control of all the receiving sets, or — raising power. If you increase your average program level 3 db, you have the same effect as doubling transmitter power. The nice part is that "Sta-Level" in many instances has gone far beyond the minimum of 3 db increase.

(3) "Sta-Level" will automatically adjust for different levels. We all are acquainted with the varied output levels of records and transcriptions. Furthermore, in these busy music-news days of broadcasting, the operator cannot keep his eyes glued to the VU meter. "Sta-Level" automatically brings up the low turntable and holds down the high one without operator attention.

(4) Here is a use many are finding for "Sta-Level": In disc jockey shows, by setting the microphone level higher

than music level an automatic fade of music during the voice transmission is possible and excellently done. For example, if the microphone fader on the speech equipment is set 15 db above the turntable fader, when using the microphone, the music will fade 15 db. Music will return to normal level when microphone is no longer used. Recovery time is smooth, quite like a normal up fade.

GENERAL INFORMATION

RECOVERY SPEED: As supplied, "Sta-Level" recovers 2/3 level in 7 seconds and 90% level in about 28 seconds. This is considered typical. However, a kit of small fixed resistors is supplied. If the operator feels this is too slow or too fast, he may, by changing two resistors, increase recovery to as fast as 2 1/4 seconds for 2/3 level and 10 seconds for 90% level, or as slow as 11 1/4 second for 2/3 level and 45 seconds for 90% level.

ACCESSORIES: None needed. "Sta-Level" is a complete one-chassis unit, regulated power supply and all self-contained.

GAIN: As "Sta-Level" has up to 62 db gain, if your present system is short of gain, "Sta-Level" will pick it up. Of course, both input and output level controls are on the front panel to adjust for any gain you wish right down to unity or up to the full 62 db.

"STA-LEVEL" AUTOMATIC PROGRAM LEVEL AMPLIFIER

SPECIFICATIONS

POWER SUPPLY: Regulated type, self-contained.

POWER INPUT: 105/115 volts, 50/60 cycles at 50 watts.

RECOVERY: Switch selects average or dual recovery time to accommodate operational mode best suited to engineering preference.
Chart provided as guide.

COMPRESSION: Special regulator circuit holds threshold of compression constant. Rated 0-30 db but excellent performance to 40 db.

DISTORTION: 1% or less 50-15,000 cycles 0-30 db of compression when using +20 dbm output threshold level.

RESPONSE: ± 1 db 30-15,000 cycles, 0-30 db compression.

NOISE: 65 db below output 0-30 db compression at +20 dbm threshold level.

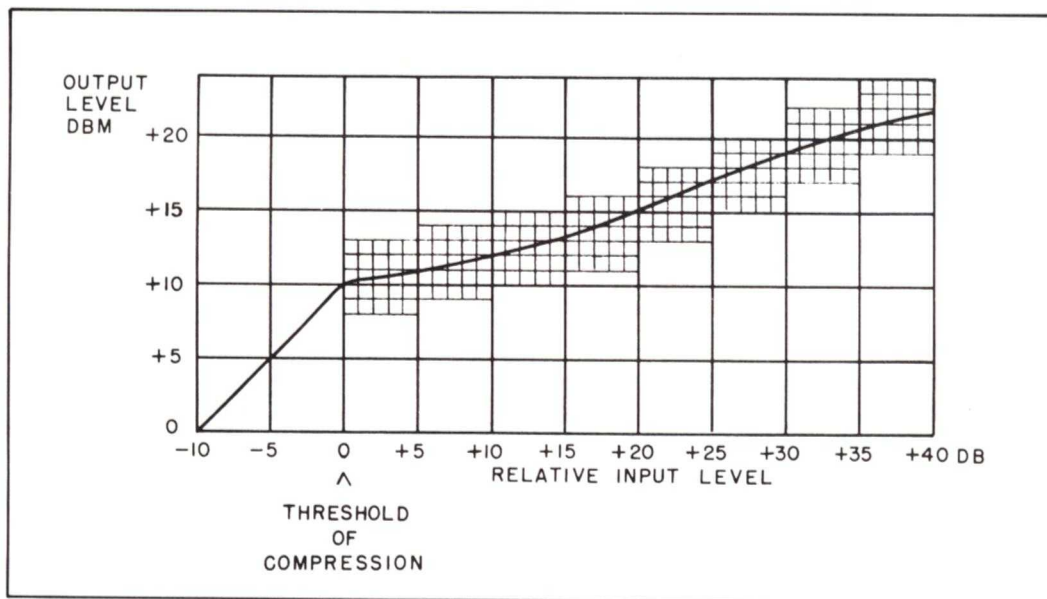
GAIN: 62 db ± 2 db.

IMPEDANCES: 600 ohms input and output.

SIZE AND CONSTRUCTION: 19" x 5 1/4" panel. 7" deep. Front panel drops down to service all internal parts.

TUBES: Two 6V6, one each 6386, 12AT7, 6AL5, OB2, 5Y3GT.

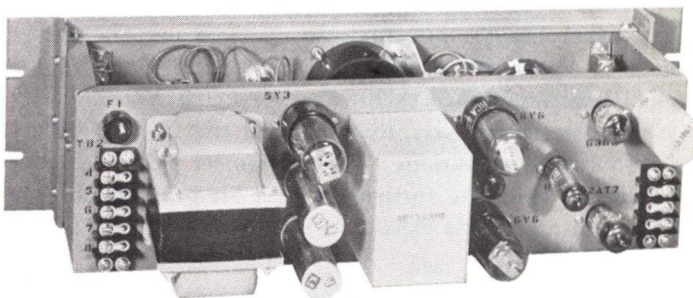
FINISH: Medium gloss gray with lettering in white.



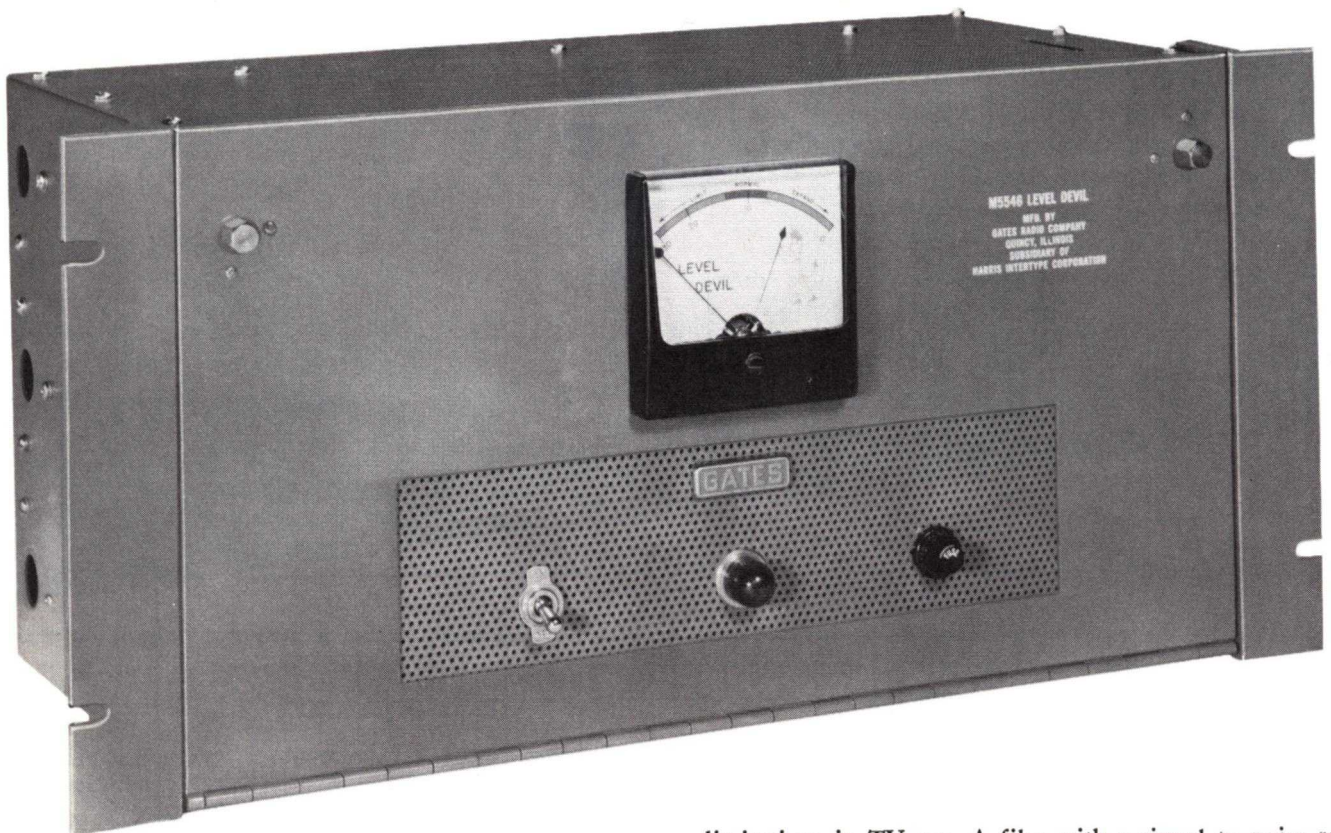
ORDERING INFORMATION

"Sta-Level" complete with tubes and ready to operate M-5167
Spare 100% tube kit for above TK-243

Front panel drops down for complete inner servicing. Big advantage of this type of construction is ability to keep important inner workings clean by means of bellows or small suction type cleaner.



"LEVEL DEVIL" PROGRAM GATED AMPLIFIER



A new average level amplifier where in the absence of signal, the aural noise level does not rise above the original level established by the average signal.

A contrast will best illustrate the marked engineering advancement in the new Gates "Level Devil". In older average level amplifiers, during a period of program silence, the lower signal level referred to as noise was expanded. A baseball or football game is an excellent example. When the sports announcer was silent for a moment or two, the crowd noise expanded to a sizable increase. Conversely, when the announcer spoke, the crowd noise immediately decreased.

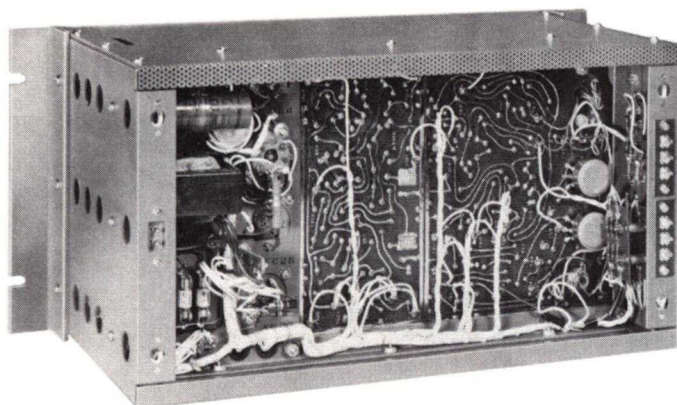
With "Level Devil" this difficulty is overcome. In the absence of signal, the noise level does not rise above the original level established by the average signal. With older average level amplifiers, the noise will rise 10 to 15 db. under equivalent conditions. — The engineer will quickly recognize the ability to further up level his programming as the concern of noise expansion is now at a minimum.

Constant level amplifiers have, until "Level Devil", had

limitations in TV use. A film with a signal to noise ratio of 30 db. (average value) could not tolerate a background noise increased during a period of silence on the film. With older constant level amplifiers, the background noise would increase around 10 db. — very noticeable to the listener. "Level Devil" overcomes this background noise increase and thus becomes ideal in television broadcasting as well as in FM and AM. Field testing has shown that "Level Devil" used with TV or FM without a peak limiting amplifier, has an overshoot of not more than 1 db. as observed with the application of a 10 db. increase of a complex wave input signal. While this operation is considered satisfactory for TV or FM, a peak limiting amplifier is desirable with "Level Devil" for AM operation.

GENERAL DESCRIPTION: "Level Devil" is a new concept in average level amplifiers that will accept input signals over a 30 db. range and hold the output constant (0 to +3 db.) over this range of input levels. Below the expander threshold "Level Devil" is a linear amplifier. At the expander threshold (—10 db. relative) the gain increases 10 db. Above this level the amplifier acts as a

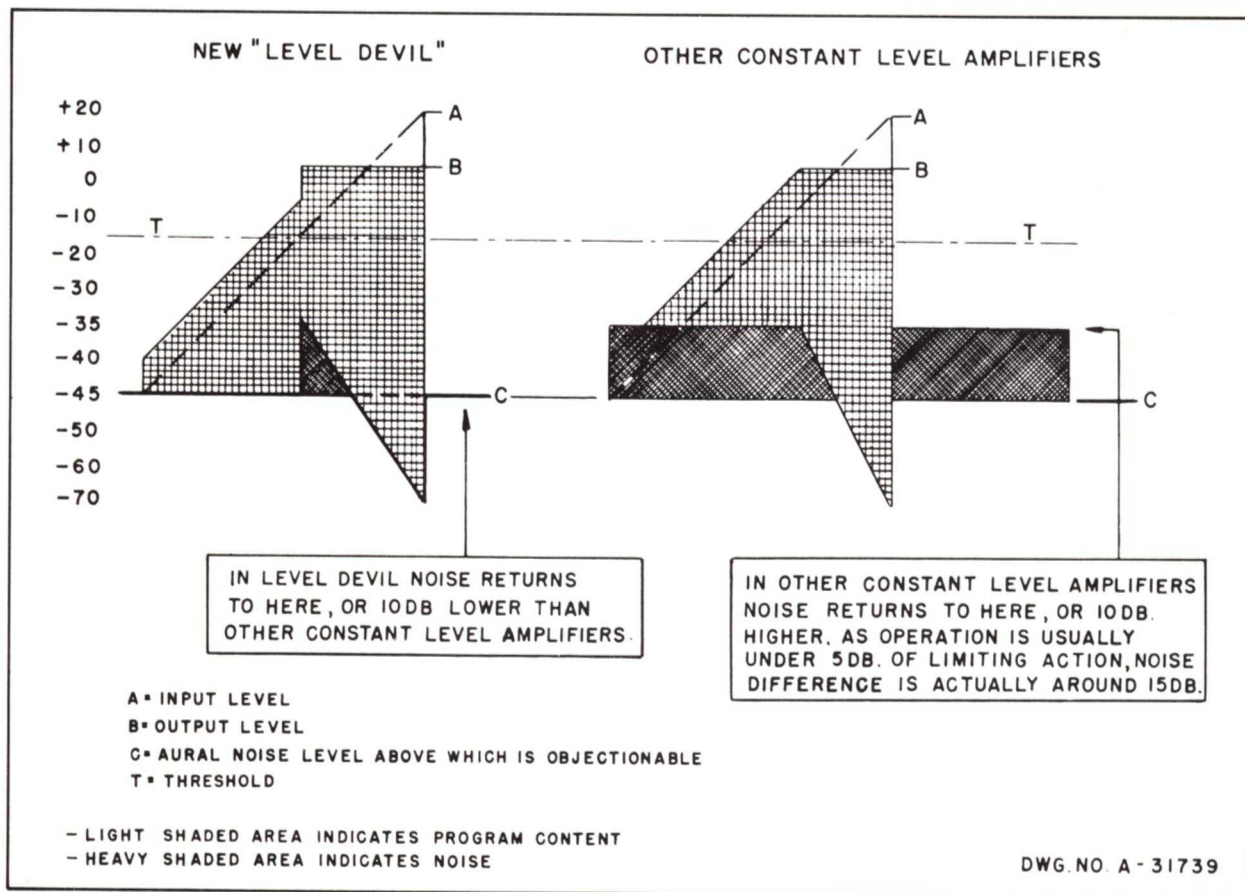
"LEVEL DEVIL" PROGRAM GATED AMPLIFIER



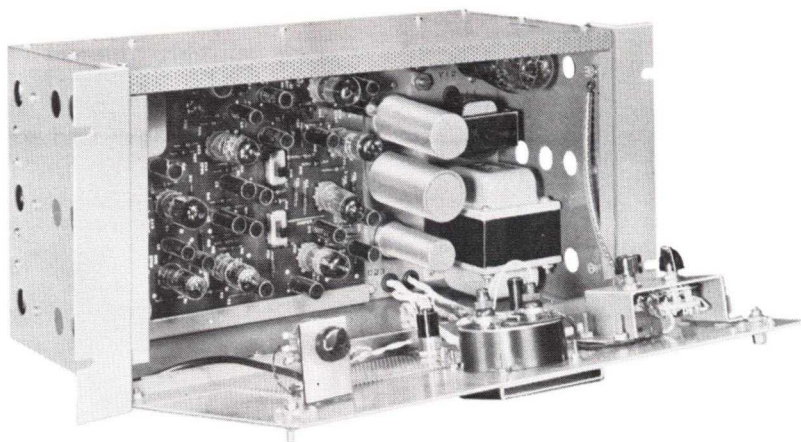
APPLICATION: As "Level Devil" is an improved design over all older constant level amplifiers, the application is universal wherever audio is employed. The advantages in TV and FM broadcasting are quickly understood by reason of much less expansion of background noise. Use in other services such as film, tape and disc recording offers many outstanding advantages. — "Level Devil" opens wide new areas of usage by eliminating the noise expansion objection and is recognized as an outstanding contribution to all modes of transmission.

peak limiter. However, in "Level Devil", at no signal condition, the amplifier does not return to full gain but 10 db. less. As a result, input levels as much as 10 db. below normal are expanded to normal output level but input signals below this level do not cause expansion. It can then be said that a signal to noise ratio of 13 db. or lower will not be expanded.

SERVICING AND CONSTRUCTION: Hinged down front panel permits complete front accessibility of components and inner servicing adjustments. Gates solid adhesion process printed wiring assures uniformity and ease in both cleaning and circuit analysis. Finish is in medium gloss gray over a heavy prime coat. Design is for continuous duty.



"LEVEL DEVIL" PROGRAM GATED AMPLIFIER



SPECIFICATIONS

IMPEDANCES: Input and output 600 ohms.

INPUT LEVEL: -35 VU to +27 VU. (10 db. and 20 db. input, pads incorporated.

OUTPUT LEVEL: +8 VU (includes 6 db. H-type line isolation pad).

DISTORTION: 1% or less 50-10,000 cycles up to 10 db. limiting.
2% or less up to 25 db. limiting.

RESPONSE: ± 1 db. 30-15,000 cycles.

ELECTRICAL NOISE: -60 db. or better below 10 db. limiting.

MAXIMUM EXPANSION: 10 db. (NOTE: Level Devil can release 5 db. of compression and expand 10 db., giving effective signal increase of 15 db.)

POWER INPUT: 105/125 volts, 50/60 cycles at 55 watts.

FUSING: Type 3AG, 1 ampere.

SIZE: 19" wide, 8 $\frac{3}{4}$ " high, 8 $\frac{1}{2}$ " deep.

WEIGHT: Net 28 lbs. Gross 35 lbs. — Cubage (export) 2.

TUBES: Two each 5749, 12AU7, 12AT7, 12AX7 and OB2.

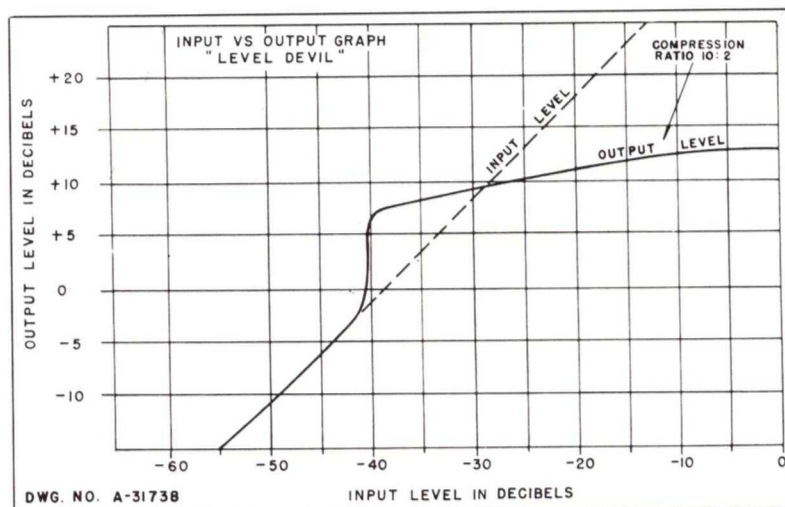
One each EF86 and 5V4G.

FINISH: Medium gloss gray.

ORDERING INFORMATION

"Level Devil" complete with tubes Cat. M5546

100% spare tube kit for above Cat. TK331



MAXIMUM LIMITING: 25 db.

LIMITER ATTACK TIME: 10 milliseconds.

LIMITER RELEASE TIME: 1 $\frac{1}{2}$ to 2 seconds.

EXPANDER RISE TIME: 2 seconds.

EXPANDER RELEASE TIME: 4 seconds.

GAIN: 50 db. without expansion or limiting.

"UNI-QUE" CUEING AMPLIFIER



In modern radio and television, many operators will agree that the cueing amplifier is equal to a third arm. It eliminates complicated control board switching and does more to prevent dead air than any other item of audio control — The Gates "UniQue" is offered in two models. A rack mount cueing amplifier with an eleven-position input switch to select "UniQue" to ten circuits and off. — The second model is desk mount and varies only by elimination of the rack housing and selector switch.

"UniQue" is a correctly designed amplifier with self-contained loudspeaker and its own silicon rectifier power

supply with such high intelligibility that voice or music is easily heard over the level of a bass reflex monitoring speaker operating at even higher level. Either low impedance or bridging input balanced and isolated requires no additional coupling transformers. The high gain permits cueing directly from turntable or microphone channels and a gain control is front panel mounted for exact adjustment.

With modern speech input systems supplying numerous cueing circuits and only requiring the cueing amplifier for completion, the Gates "UniQue" will find an urgent need in every modern broadcasting control room.

SPECIFICATIONS

GAIN: 70 db $\pm$ 2 db.
DISTORTION: 3% or less, 50-10,000 cycles at +30 dbm output.
NOISE: 50 db or better below +30 dbm output measured at —50 dbm input or mixing bus level.
RESPONSE: Peaked for high intelligibility.
INPUT LEVEL: At low impedance —20 dbm.
 At bridging +22 dbm.
IMPEDANCES: Input 30/50 or 150/250 ohms.
 Bridging: 10,000 ohms.
 Output 4 ohms to terminals and strapped back to speaker so speaker line may be broken by muting relay.

POWER: 105/125 volts, 50/60 cycles, 23 watts.*
TUBES: 12AX7, 50C5 and M-500 silicon rectifier.
SIZE: Desk type: 12-1/8" wide, 3" high, 7 1/2" deep.
 Rack type: 19" wide, 3 1/2" high, 6 1/2" deep.**
FINISH: Medium gloss gray, lettering in white.
WEIGHT: Net 10 lbs. Packed 16 lbs. Cubage 1.
 * Power supply is transformer isolated to power line and not AC/DC.
 ** Rack model is supplied with 11-position input switch.

ORDERING INFORMATION

"UniQue" rack mount with tubes **M-5377**
 "UniQue" desk mount with tubes **M-5377A**
 Spare tube kit for either model **TK-305**



New Gates cueing amplifier for desk mounting. Only 3" high, 12" wide and 7 1/2" deep, the "UniQue" consumes negligible space. Where space is very limited mounting may be on the side of a desk, attached to a turntable cabinet or any convenient location.

PROGRAM OR LINE AMPLIFIER

In radio or television where a truly fine quality program or line amplifier is needed, the Gates M-5576 is enthusiastically recommended. Incorporating the proven, long-lasting uniformity of printed wiring and the resulting entire elimination of parts stacking, the clean construction for easy servicing is only excelled by day-in day-out steady top quality performance.

Amplifier has four stages with a dual grid gain control, having one section in the grid of the second stage and the second section in the grid of the third stage. In this manner the lowest noise ratio is always maintained. The front panel drops down to reach all under chassis components. Front panel equipment includes gain control, AC switch, fuse and neon pilot light.

Screw-type terminals on the rear are located for good rack wiring practice with AC terminated to a barrier type terminal board. A hum balance control, which the M-5576 incorporates, is necessary in precise broadcasting. Features of the M-5576 amplifier are the sterling performance, extremely firm specifications and durability.

ORDERING INFORMATION

Program or line amplifier complete with tubes M-5576
100% spare tube kit for above TK-304



SPECIFICATIONS

GAIN: 75 db ± 2 db.
DISTORTION: 0.5% or less 50-15,000 cycles at +12 dbm output.
0.75% or less 30-15,000 cycles at +12 dbm output.
1% or less 50-15,000 cycles at +22 dbm output.
RESPONSE: ± 1.5 db from 30 to 15,000 cycles.
NOISE: 60 db or better below -60 dbm input at +12 dbm output or equivalent to -120 dbm relative input noise.
IMPEDANCES: Input 150/250 or 500/600 ohms. Output 150/250 or 500/600 ohms.
TUBES: (3) 5879, (1) 12AU7, and (1) 6X4 rectifier.
POWER: 105/125 volts, 50/60 cycles, 15 watts.
SIZE: 19" wide, 5 1/4" high, 7 1/2" deep.
WEIGHT: Net 12 lbs. Packed 27 lbs. Cubage 2.

ULTRA LINEAR MONITORING AMPLIFIER



In today's broadcasting the need for excellence in loud-speaker distribution systems is apparent. Here is an amplifier that is ahead of the finest loudspeaker system developing a guaranteed 1% or less distortion at +40 dbm output or 10 watts.

Unusual in monitoring amplifiers is the high gain of 100 db, yet the usual provision for bridging a +8 dbm program line is incorporated. With high gain, this amplifier may be used directly from a mixer program bus, a low level turntable or microphone. The M-5575 amplifier has been designed for all monitoring requirements.

Actually two amplifiers comprise the total unit. A two-stage monitor booster amplifier operates ahead of the three-stage monitoring amplifier, with the gain control between the two amplifiers. The ultra linear output circuit and dual EL84 tubes, driven by a floating paraphase phase inverter where audio drive voltage is maintained constant, provides the undisputed 1% 10-watt output.

The front panel drops down to reach all under-chassis

parts. Panel equipment includes gain control, AC switch, pilot light and fuse. Terminations are to screw type terminals with AC to an approved barrier strip. Hum balance control is reached by dropping down the front panel.

Though designed specifically for the precise needs of radio and television broadcasting, the discriminating user of sound for industry, theatre, schools and home will possess the ultimate in sound amplifying equipment in the Gates M-5575 amplifier.

SPECIFICATIONS

GAIN: Maximum, 100 db ± 2 db. Bridging, 50 db ± 2 db.
DISTORTION: 1% or less 50-15,000 cycles at +40 dbm output (10 watts).
RESPONSE: $\pm 1 1/2$ db, 30-15,000 cycles.
NOISE: 60 db or better below +40 dbm measured at -50 dbm input.
IMPEDANCES: Input 30/50 or 150/250 at full gain of 100 db. 30,000 ohms at gain of 50 db. Output 8 or 16 ohms (see matching transformer below).
TUBES: (3) 12AX7, (2) EL84, (1) GZ34 or 5V4, (1) OA2, (1) OB2.
POWER: 105/125 volts, 50/60 cycles, 85 watts.
SIZE: 19" wide, 7" high, 8" deep.
WEIGHT: Net, 18 lbs. Packed, 34 lbs. Cubage 2 1/2.
SPEAKER MATCHING TRANSFORMER: Optional accessory where many speakers are employed. Primary 48 ohms. Secondary 8 ohms. Permits loading as many as 8 speakers to output of amplifier. Transformer is installed with speaker... (Cat. A-30601)

ORDERING INFORMATION

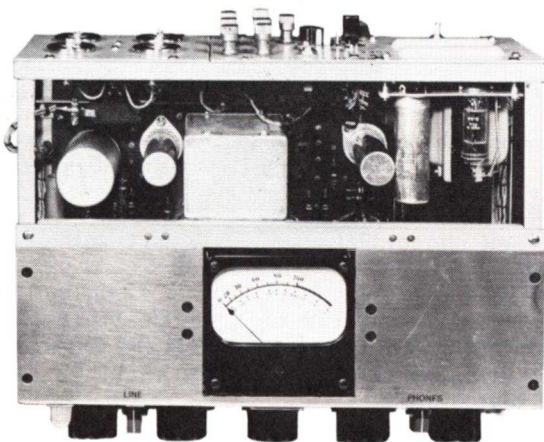
Ultra Linear Monitoring Amplifier M-5575
100% spare tube kit for above TK-303

THE "DYNAMOTE" PORTABLE REMOTE AMPLIFIER

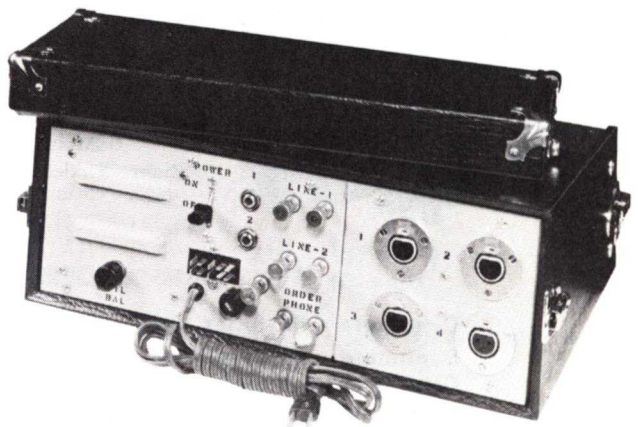


"Dynamote" has been symbolic of remote amplifying equipment for nearly a quarter century. The name originated back when the dynamic microphone was first introduced. Today's "Dynamote" is compact, modern, easy to operate and portable. Weighing only 22 pounds, it measures 5 $\frac{7}{8}$ " high, 10 $\frac{1}{4}$ " wide and 17 $\frac{3}{4}$ " deep with battery compartment attached. Hinged illuminated 4" VU meter, which folds in when not used, swings to exact eye level for easy reading.

Four mixing channels handle four or less low impedance microphones of any type. After normal mixer and isolation pad loss is subtracted from the total amplifier gain, an abundant 90 db of gain remains to assure you of pick-up that other remote amplifiers do not afford. Printed wiring, not to be confused with printed circuit, adds greatly to reliability, and smaller size. Battery standby, with automatic changeover in case of power failure, is an optional accessory. Symbolic of superb performance, nothing has been sacrificed to put the Dynamote in a class by itself.



Looking down on the Dynamote when removed from the case showing accessibility of parts for servicing. Entire unit is constructed in rigid, lightweight frame. In this way the carrying case does not become part of the mechanical design.



Back of the Dynamote handles all connections, microphones and even holds the Off-On switch. Receptacle in center is for accommodating the optional M-4933 battery unit.

THE "DYNAMOTE" PORTABLE REMOTE AMPLIFIER

The Dynamote is constructed around a small, light-weight, welded frame to which attaches the amplifier, power supply, front panel with controls and meter, and the back panels for connectors and terminations. This slips into a rugged carrying case made of durable basswood, covered with a heavy grade of gray leatherette. A large leather handle, and hardware in nickel, add the finishing touch.

Amplifier design has four audio stages and 15 db of feed-back is employed. A full output of plus 22 dbm at 1% distortion is obtained. A 4 db output isolation pad provides a final maximum output of plus 18 dbm at no more than 1% distortion, or a 10 db range above the maximum permissible level of plus 8 dbm into a telephone

line. Mixing controls are Daven, ladder type, 20 steps of 2 db. Input is either 50 or 150 ohms.

When batteries are employed for standby, the M-4933 Continumatic adapter is purchased plus the M-4983 kit of batteries. The M-4933 adapter includes relay, metal-hinged battery compartment, cable and plug, all of which fit in the removable rear case compartment. Changeover to batteries is automatic when AC fails. Reverse is true when AC is restored.

The Dynamote is cataloged with the microphone connector plate but less microphone plugs. The entire plate of 4 connectors plugs into the amplifier chassis. No wiring is required on receipt of the equipment.

SPECIFICATIONS

NUMBER OF MIXING CHANNELS: 4

GAIN: From remote input to program line output 90 db $\pm$ 3 db.

AUDIO RESPONSE: $\pm$ 1.5 db 30-15,000 cycles (program circuit).

OUTPUT LEVEL: Program line maximum of +18 dbm at 1% distortion.

NOISE: 60 db below +8 dbm measured at -50 dbm input. Equivalent input noise is -110 dbm.

CROSSTALK: Below noise level (from other microphones).

SIZE: 10 $\frac{1}{4}$ " wide, 17 $\frac{3}{4}$ " deep, 5 $\frac{7}{8}$ " high.

WEIGHT: Net weight 22 lbs., packed at 25 lbs.

CUBAGE: 2.8 cu. ft.

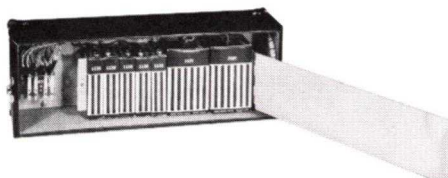
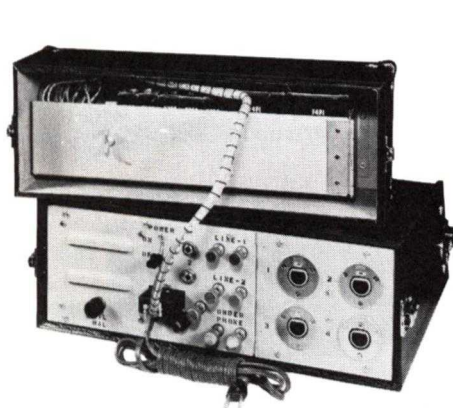
PRIMARY POWER: 115 volts, 50/60 cycles.

POWER CONSUMPTION: 40 watts.

TERMINATIONS: Microphone plugs, telephone line binding posts.

FINISH: Medium gloss gray panel with black knobs and escutcheons, gray leatherette case.

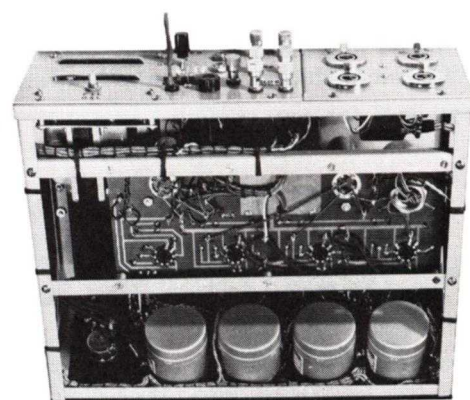
VU METER: 4" VU scale B illuminated, adjusted 0 VU indication at +8 dbm.



Left: Rear view with M-4933 battery compartment placed on top.

Center: M-4933 battery compartment with M-4983 battery kit.

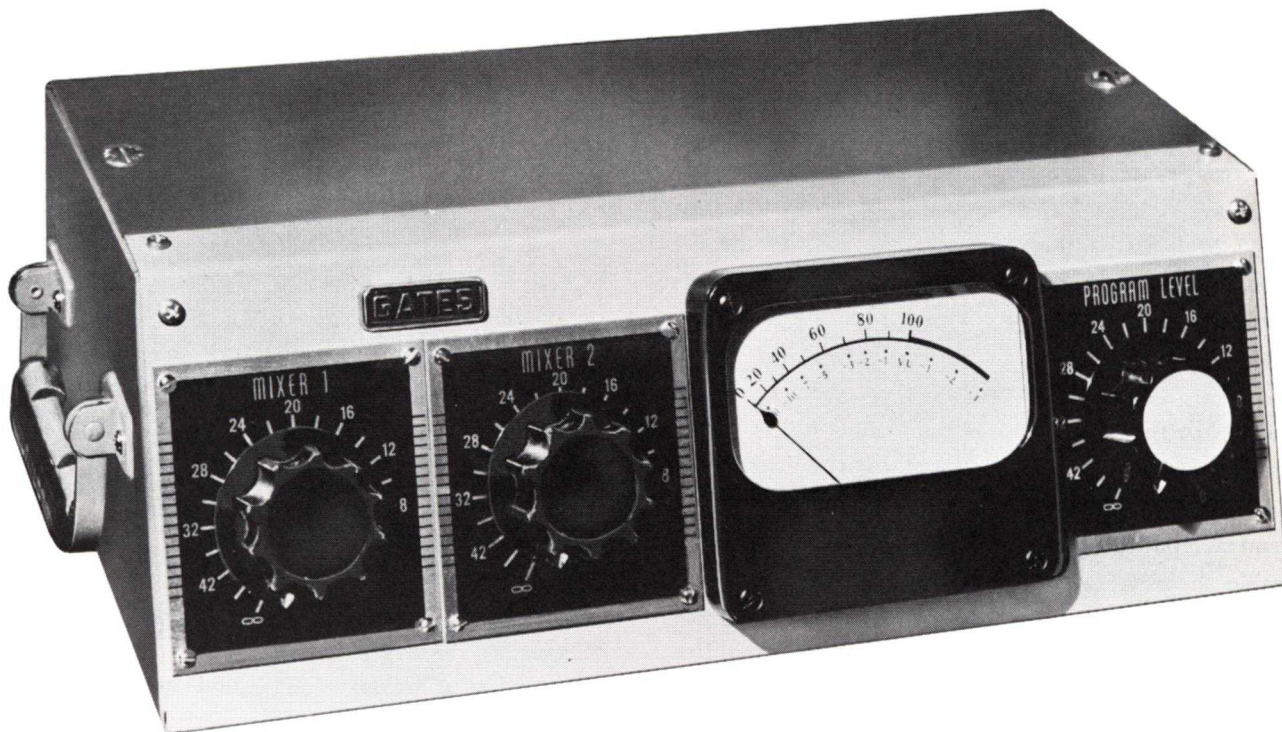
Right: Under view of Dynamote showing clean assembly by printed wiring.



ORDERING INFORMATION

Dynamote with tubes, Cannon XL receptacles and carrying case	M-4880A
Dynamote with tube, Cannon P receptacles and carrying case	M-4880B
Continumatic battery compartment with relay and plug, less batteries	M-4933
100% spare tube complement	TK-183
Microphone plug for XL receptacles, each	XL3-12
Microphone plug for P receptacles, each	P3CG125
100% set of batteries	M-4983

"BIAMOTE" — TWO CHANNEL REMOTE AMPLIFIER



Remote pickups for either radio or TV probably call for more 2-microphone installations than any other combination. The "Biamote" fills this requirement with fine performance, light weight, rugged design, and a full complement including a 4" illuminated VU meter.

Constructed in a rugged, light-weight steel cabinet finished in gloss gray with dial plates in etched aluminum. Total weight is only 15¼ lbs. ready to use. Top removes quickly and is held in place with two twist lock fasteners. Front panel slopes at approximately 12 degrees and height is only 5 inches, permitting unobstructed view of any

broadcasting event. The full size 4" illuminated VU meter is retained. "Biamote" design is functionally correct with the dual ladder type mixers to the left of the VU meter and the master gain control to the right of the meter.

All terminations are to the rear, including Off-On switch, line connections, headphone jack, microphone receptacles and power cord. Cannon type XL receptacles are standard, but larger knock-outs are provided for such connectors as the Cannon P series. These may be installed in a few minutes, where desired. A full size hinged handle is provided on one side of the amplifier case.

SPECIFICATIONS

NUMBER OF MIXING CHANNELS: 2.

IMPEDANCE: Input 50/150 ohms.

Output 500/600 ohms.

GAIN: From microphone input to program line output, 90 db +3 db from microphone input to line terminals.

AUDIO RESPONSE: +2 db 30-15,000 cycles.

HARMONIC DISTORTION: 1% or less 50-15,000 cycles +18 dbm output.

NOISE: 60 db or better below +8 dbm measured at —50 dbm input. Equivalent to —110 dbm measured.

SIZE: 14" wide, 8½" deep, 5" high.

WEIGHT: 15¼ lbs.

PRIMARY POWER: 115 volts, 50/60 cycles.

POWER CONSUMPTION: 40 watts.

FINISH: Medium gloss gray.

VU METER: Illuminated 4" full scale standard NAB VU meter.

ORDERING INFORMATION

"Biamote" with tubes, less male microphone connectors	M-5136
Male microphone connector, each	XLE-12
100% spare tube complement for above	TK-183

THE "TWINSISTOR"—TRANSISTORIZED REMOTE AMPLIFIER

With efficient, long life, temperature stabilized transistors, the Gates "Twinsistor" is the smallest, lightest, multi-channel remote amplifier, and the only transistorized dual-channel remote on the market today. Total weight with carrying case is only 7 lbs. Size is: 7½" wide, 7" deep and 3⅛" high. In addition, low current, mercury batteries, two microphone channels, true reading VU meter, and generous gain make the "Twinsistor" ideal for any situation.

Superior in performance, noise is comparable to good tube design. Response exceeds and distortion is far less than most grade A telephone lines. A plastic carrying bag of the camera type is 10½" wide, 8" high, 3½" deep. Has adjustable shoulder strap. Bag will hold amplifier, headphones and one average microphone with cable. Six transistors comprise a 4-stage temperature stabilized amplifier with push-pull output. Amplifier holds two battery kits. Changeover switch is on rear of case. Microphone receptacles are Cannon XL. Meter is standard 3" VU with fixed



pad for +8 VU output at zero scale. Master gain is not required in transistor design and attenuators may be operated at any setting without overload or noise increase. Amplifier turns on when headphones are inserted in jack.

SPECIFICATIONS

NUMBER OF MIXING CHANNELS: 2 at high level (transistor pre-amp for each stage).

IMPEDANCES: 150/250 ohm input (just less gain when using 30/50 ohm microphones). 600 ohm output.

GAIN: From microphone input to program line output 78 db $\pm$ 2 db.

AUDIO RESPONSE: $\pm$ 2 db 70-15,000 cycles. (Program circuit).

OUTPUT LEVELS: Program line maximum of +14 dbm at 2% distortion.

NOISE: 55 to 60 db or better below +14 dbm measured at -60 dbm input. Equivalent input noise is -115 to -120 dbm.

SIZE: 7½" deep, 7" wide, 3⅛" high.

WEIGHT: 7 lbs. (in case). 5½ lbs. (less case).

CUBAGE: 1.0 cu. ft.

BATTERIES: M-5339 mercury battery kit. Provisions to have two kits with changeover switch.

BATTERY LIFE: Approximately 80 hrs.

TERMINATIONS: Microphone plugs, program line binding posts.

FINISH: Medium gloss gray.

VU METER: Standard 3" VU with fixed pad for +8 VU output at "zero" scale.

ORDERING INFORMATION

"Twinsistor" complete with carrying case and one set of batteries	M-5168
Male microphone connector (2 required), each	XL3-12
Battery kit in container and wired	M-5339
Microphone with swivel to plug in back of "Twinsistor"*	M-5332

*Microphone Electro-Voice 648.

THE "UNIMOTE" REMOTE AMPLIFIER



Here is broadcasting's fastest selling single microphone AC operated remote amplifier. Designed to particularly fill the universal need of a fine performing, dependable and compact remote control amplifier, the M-5531 "Unimote" will perform equally well as a microphone preamplifier, turntable preamplifier, program amplifier up to +18 dbm output, repeater amplifier, isolation amplifier and as a standby amplifier for quick connection to an emergency circuit.

Size is only 11" wide, 5 $\frac{3}{4}$ " high and 5" deep. Cover removes for 100% accessibility by two snap locks. Printed wiring is employed throughout for uniformity and dependability.

SPECIFICATIONS

IMPEDANCES: Input 30/50 or 150/250 ohms.
Output 150/250 or 500/600 ohms.

GAIN: From microphone input to program line output,
81 db $\pm$ 2 db.

AUDIO RESPONSE: $\pm$ 1 $\frac{1}{2}$ db from 30-15,000 cycles
(program circuit).

OUTPUT LEVELS: Program line maximum of 1% distortion at +8 dbm.
Program line maximum of 1 $\frac{1}{2}$ % at +18 dbm.

NOISE: 60 db or better below +8 dbm measured with
—60 dbm input or —120 dbm relative input noise.

TUBES: (2) EF86, (1) 12AU7 and (1) 6X4 rectifier.

SIZE: 11" wide, 5" deep, 5 $\frac{3}{4}$ " high.

WEIGHT: 11 lbs.

CUBAGE: 1.0 (cu. ft.)

PRIMARY POWER: 105/125 volts, 50/60 cycles.

POWER CONSUMPTION: 15 watts.

FINISH: Medium gloss gray.

ORDERING INFORMATION

"Unimote" Amplifier with tubes	M-5531
100% spare tube kit for above	TK-280
Microphone connector (male), Cannon	XL3-12

THE "AUTOMOTE" TRANSISTORIZED REMOTE AMPLIFIER



Transistorized for long life and top grade performance, the single channel "Automote" allows complete control from the studio by the use of a wall switch located on or near the studio control board. A neon pilot light tells the artist when he is "on" and "off" air.

The "Automote" can be used as a microphone preamplifier with inbuilt warning light for the studio that is around the corner from the control room or on another floor. It can be used as a microphone amplifier in connection with tape recorders — it tells artist when recording engineer is ready. In its basic use, it is ideal in places such as churches, ballrooms and sports areas because of positive cue and no dead air.

Able to operate for 80 hours on a set of inexpensive batteries, the remote operation is entirely unattended. Each stage is temperature stabilized for operation up to 140° F. Special techniques applied develop low distortion, wide dynamic range and very low noise.

All controls and terminations are inside the cabinet which is provided with lock and key. In this way, control functions cannot be tampered with. The only external device is the "on air" light. Cabinet may be bolted to the wall or placed on a desk, as desired.

A small, sensitive, low current relay, located in the amplifier cabinet, receives its current from the two small batteries, also in the cabinet. When the telephone line is closed at the studios, the relay operates, turning on the transistor amplifier and neon "on air" light. Likewise, when the circuit is opened at the studios, the relay opens, amplifier and "on air" light turn off. The very finest broadcast quality is obtained while the end result is the same as the artist being in an adjoining studio and often missed aural cues are dispensed with.

Tests have been conducted using "Automote" on 47 miles of line, as operation is based on 10,000 ohms maximum resistance. Lines up to 100 miles in length would be possible providing no repeater was in the telephone line circuit.

SPECIFICATIONS

MIXING CHANNELS: 1

IMPEDANCES: Input 150/250 ohms
Output 500/600 ohms

GAIN: From microphone input to program line output
78 db ± 2 db

AUDIO RESPONSE: ± 2 db, 50 to 10,000 cycles

OUTPUT LEVEL: ± 14 dbm

HARMONIC DISTORTION: 2% or less 50-10,000 cycles.

NOISE: 55 to 60 db below +14 dbm measured at —60 dbm input

SIZE: 10½" wide, 8½" deep, 4½" high

WEIGHT: 9¼ lbs.

PRIMARY POWER: Batteries — (2) XX30, 45 volt,
and (1) M-5339 Gates mercury
battery pack

FINISH: Medium gloss two-tone gray

ORDERING INFORMATION

Automote remote amplifier complete with one set of batteries and switch box	M-5500
Microphone connector (male)	XL3-12
Spare mercury battery kit	M-5339
Spare relay battery (2 required)	XX30

THE TRANSMOTE — TRANSISTORIZED SINGLE CHANNEL REMOTE



Outstanding features of the "Transmote" are: Very small size extreme light weight non-microphonic battery operation, and long life, low cost battery operation.

Five transistors are used in 4 temperature stabilized stages, the output stage being push-pulled. Level control, headset jacks, microphone receptacle, gain control and output binding posts are all properly located for both portable or stationary service. Amplifier turns on when phones are inserted in jack. A plastic jack plug is provided where phones are not used. It is impossible to

close the carrying case without removing the phone plug and turning off the amplifier voltage.

Leather carrying case has adjustable shoulder strap that is removable. Case will fit suit coat or overcoat pocket. Here is compact, top-performing equipment, with all the desirable features of transistors.

SPECIFICATIONS

IMPEDANCES: Microphone input 150/250 or 30/50 ohms.

Headphone output impedance, 600 ohms.

GAIN: From microphone input to program line output: 78 db ± 2 db.

AUDIO RESPONSE: ± 2 db from 50 to 10,000 cycles.

OUTPUT LEVEL: +14 dbm to program line with 2% maximum distortion from 70 to 10,000 cycles.

NOISE: 55 to 60 db below +14 dbm measured at —60 dbm input.

Equivalent input noise —115 to —120 dbm.

SIZE: (carrying case) 3 1/2" wide, 2 1/2" deep, 9 1/2" high.

(less carrying case) 3" wide, 1 7/8" deep, 8 5/8" high.

WEIGHT: 3 lbs. net with case.

CUBAGE: 1.0 cu. ft.

PRIMARY POWER: (3) 8 volt mercury batteries in kit M-5339.

FINISH: Medium gray cabinet, brown leather carrying case.

ORDERING INFORMATION

Transmote with carrying case, one set	
batteries	M-5311
Transmote less carrying case, with batteries	M-5311A
Complete spare battery kit*	M-5339
Mating microphone connector	XL3-12

*Wired, in container, ready to insert.

THE TUBELESS TUBE

Often in TV production, or longer than normal lines, it is desirable to raise the potential gain of a microphone circuit. The tubeless tube, a small transistorized amplifier, does just this. Designed to connect at any place into the microphone cable such as on a boom stand, it may be placed on the floor being non-microphonic. It is built into an aluminum tube 2" in diameter and 4 1/2" long. Cannon XL receptacles are on each end. As the battery drain is extremely low, the tubeless tube may be turned on and left on for over a year before changing batteries. Batteries are self-contained. Set screw in case functions as On-Off switch, used only when storing. Design is a single stage transistor, which is temperature stabilized. Finish is in gray.

SPECIFICATIONS

GAIN: 15 db ± 1 db with 150/250 ohm microphones.

FREQUENCY RESPONSE: ± 3 db 70-15,000 cycles.

DISTORTION: Under 0.5% from 70 to 15,000 cps at —45 dbm output.

NOISE: 58 to 65 db or better below —60 dbm input level, or —118 to —125 dbm equivalent input noise.

SOURCE IMPEDANCE: 150/220 ohms.

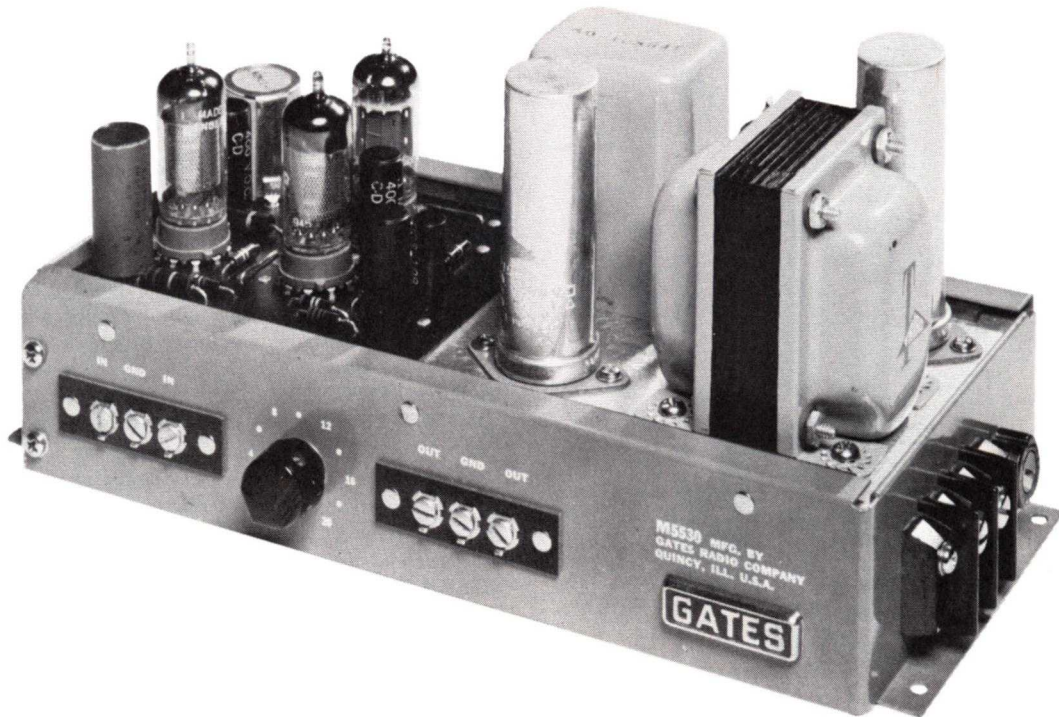
OUTPUT IMPEDANCE: 50/150 ohms.



ORDERING INFORMATION

Tubeless Tube, with batteries	M-5312
Mating input connector	XL3-12
Mating output connector	XL3-11
Battery kit	M-5350

M-5530 ALL-PURPOSE UTILITY AMPLIFIER



The Gates all-purpose Utility Amplifier with self-contained power supply may be used for many different services in radio and television. Incorporating standard broadcast coupling impedances along with high-quality components and printed wiring, reliability and performance are outstanding.

The M-5530 Utility Amplifier May Be Used As:

- A single channel remote amplifier with nothing else to buy except microphone and XL3-13 microphone connector.
- A high gain, low noise turntable preamplifier possessing the extra gain needed for modern low level pickups through passive equalizers.
- A line, repeater or program amplifier with performance standards approaching the very best.
- A standby, ready to patch in where needed.
- A microphone amplifier for feeding professional high level input tape recorders.

The M-5530 amplifier is a direct, modern replacement for the famous Gates SA-134 amplifier, of which thousands are in use. From low impedance input through the 81 db of gain to a choice of output impedances is embodied the finest of materials. Reliable performance is emphasized through the uniformity and lasting qualities of printed wiring, a low flux density power transformer, high shielded input transformer and the mandatory requirement of more rugged smaller parts when applied to the printed wiring process.

The entire unit is made on one printed wiring formica plate and one aluminum plate. These plates are mounted

in a 16 gg. steel chassis. This chassis contains the terminations, gain control and fuse. On the left end a knock-out is provided for a standard Cannon XL3-13 connector for attaching a microphone if used as a remote amplifier. The right end has a barrier strip for AC connection and fuse.

SPECIFICATIONS

IMPEDANCES: Input 30/50 or 150/250 ohms.
Output 150/250 or 500/600 ohms.

GAIN: From microphone input to program line output 81 db ± 2 db.

AUDIO RESPONSE: $\pm 1\frac{1}{2}$ db, 30 to 15,000 cycles.

NOISE: 60 db or better below +8 dbm output measured at -60 dbm input. Equivalent input noise is -120 dbm.

DISTORTION: 1% or less 50 to 15,000 cycles @ +8 dbm output.
 $1\frac{1}{2}\%$ or less 50 to 15,000 cycles @ +18 dbm output.

TUBES: (1) EF86 1st audio (1) EF86 2nd audio, (1) 12AU7 3rd audio (1) 6x4 rectifier.

TOTAL TUBES: 4

TOTAL TUBE TYPES: 3

SIZE: 11" wide, 5 $\frac{3}{4}$ " deep, 5" high.

WEIGHT: 6 lbs. net, 9 lbs. packed.

CUBAGE: 1.6.

PRIMARY POWER: 105-125 volts, 50/60 cycles.

POWER CONSUMPTION: 15 watts.

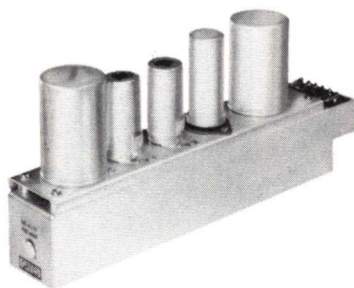
TERMINATIONS: Terminal strips.

FINISH: Medium gloss gray.

ORDERING INFORMATION

Model M-5530 all-purpose utility amplifier
with tubes **M-5530**
Spare 100% spare tube complement for above **TK-280**
Chassis connector where used with microphone **XL3-13**
Microphone plug for above chassis connector.. **XL3-12**

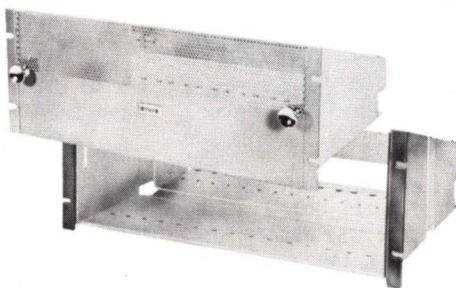
PLUG-IN PREAMPLIFIER — PROGRAM AMPLIFIER — BRIDGING CONTROLS



PRE-4 AMPLIFIER

GAIN: 40 db ± 1 db.
DISTORTION: 0.5% or less 50-15,000, 0.75% or less at 30 cycles. Measured at +8 dbm output.
NOISE: 90 db below +10 dbm output (—120 to —124 dbm equivalent input noise).
LEVELS: Maximum input —32 dbm. Maximum output at above rated distortion, +8 dbm.
IMPEDANCES: Input 150 and 250 ohms. Output 150 and 600 ohms. As input transformer is unloaded, the impedance is substantially higher than source impedance over entire range.
POWER: Requires 6.3 volts AC or 0.3 amperes and 275/310 volts DC at 6 MA.
TUBES: Two type 5879.
CIRCUIT: Two-stage shunt fed output. Over-all feedback from plate of second stage to cathode of first stage.
MECHANICAL: Size 2 1/16" x 11 1/2" x 5 3/8" high overall. Mounts eight in one PAS-1 panel and shelf assembly. One PWR-3 power supply will operate up to 26 preamplifiers.

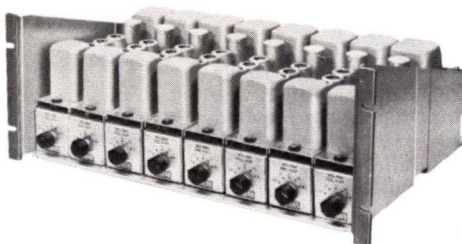
Preamplifier with Tubes PRE-4
 100% Spare Tube Complement ... TK-112
 Base and Receptacle BA-20



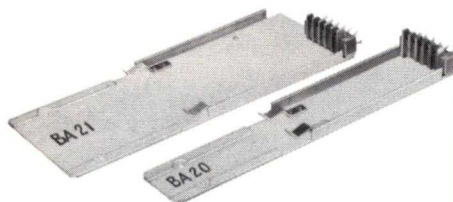
PANEL AND SHELF ASSEMBLY

Used for rack or multiple mounting of plug-in units. Requires only 7" x 19" rack space. Front is ventilated by top half being perforated and is instantly removable to allow removing amplifiers from the front, or making gain adjustments. The BA-20 or BA-21 bases with receptacle, listed below, fasten to the bottom of the panel and shelf assembly. Depth is 13 3/8". Finish medium gloss gray.

Panel and Shelf PAS-1



Here are 8 plug-in preamplifiers mounted on one PAS-1 panel and shelf assembly, requiring only 7" x 19" of rack space. Self-aligning plugs and receptacles allow unlimited interchange of amplifiers without resetting plugs or receptacles.



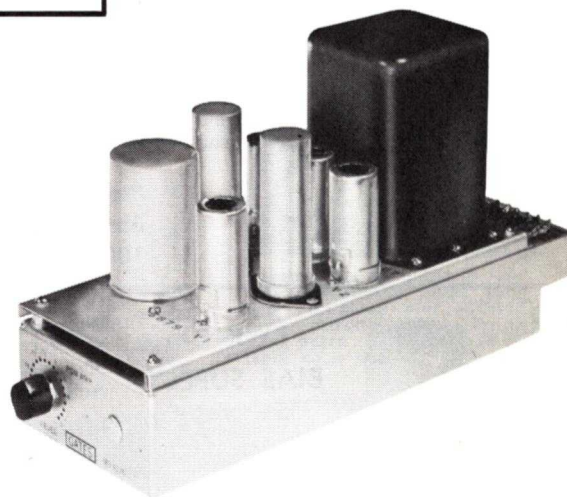
BASE AND RECEPTACLE

Two bases accommodate all plug-in units. Model BA-20 is for all pre-amplifiers. BA-21 is for program and monitoring amplifiers and PWR-3 regulated power supply. Mounts on bottom of PAS-1 panel and shelf assembly. Where other mounting desired may be secured to any panel, base of desk, or wood cabinet. Supplied with receptacle.

Base and Receptacle BA-20
 BA-21

LEVELS: Maximum input +8 dbm. Maximum output +24 dbm.
IMPEDANCES: Input 150 and 600 ohms. Output 600, 150 ohms.
POWER: 6.3 volts AC at 1.05A and 300/330 volts DC at 37 MA.
TUBES: Three 12AU7 and one 5879.
CIRCUIT: Three stages with push-pull output. Feedback between second and third stages.
MECHANICAL: Cold rolled steel chassis, die formed and heavily plated.
SIZE: 4 1/8" x 11 1/2" x 6 5/8" high overall. Type PWR-3 power supply will operate from one to four of these program amplifiers.

Program amplifier with
 tubes PGM-4
 Base and receptacle BA-21
 100% spare tube complement TK-122



BRIDGING CONTROLS

For use with all Gates plug-in amplifiers where bridging input is preferred over direct impedance matching. As all bridging controls insert various degrees of loss in the circuit, this should be taken into consideration. Two high quality carbon controls in tandem, balanced to ground, make up each control. Mounting is external to amplifier.

AT1 Control, 10,000 ohms to 150 ohms
 AT2 Control, 10,000 ohms to 600 ohms
 AT3 Control, 20,000 ohms to 150 ohms
 AT4 Control, 20,000 ohms to 600 ohms

PGM-4 PROGRAM AMPLIFIER

USE: As high quality program or line amplifier where output up to +24 dbm at low distortion is desired. One or two of these amplifiers will operate from a single PWR-3 regulated power supply listed on next page.

GAIN: 65 db as a line or program amplifier, direct matching of impedances. Where used as bridging amplifier with AT2 bridging volume control, the gain is 33 db.

RESPONSE: $\pm$ db 30-15,000 cycles.

DISTORTION: 0.5% 50-15,000 cycles. 0.75% or less at 30 cycles, at +24 dbm output.

NOISE: 79 db or better below +24 dbm output with volume control fully open. (—120 to —124 equivalent input noise).

PLUG-IN MONITORING AMPLIFIER AND POWER SUPPLY

MON-4 MONITORING AMPLIFIER

USE: For loudspeaker distribution, recording and auxiliary program amplifiers. High gain allows use with bridging controls or other loss circuits. One PWR-3 power supply and one PWR-10 bias supply, listed below, will operate one or two MON-4 monitoring amplifiers or one monitoring amplifier, one program amplifier and four preamplifiers.

GAIN: As straight amplifier, 103 db. When used with AT2 bridging control, 70 db.

RESPONSE: ± 2 db 30-15,000 cycles.

DISTORTION: 3% or less at +37 dbm with gain control fully open. (Equivalent input noise -120 to -124 db).

LEVELS: Maximum input -27 dbm. Maximum output +37 dbm.

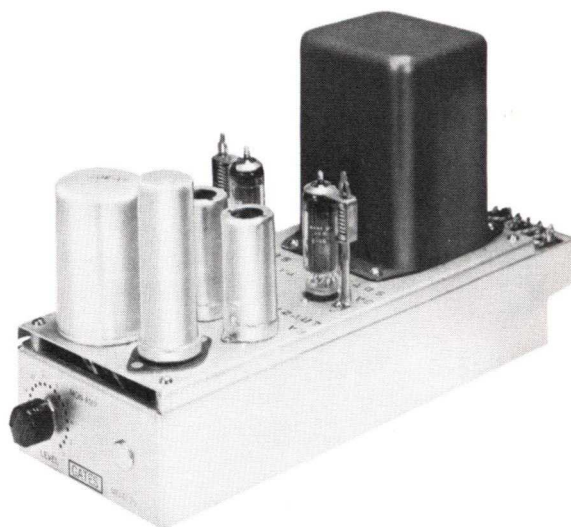
IMPEDANCES: Input 150 and 600 ohms. Output 600, 150, 16, 8 and 4 ohms.

POWER: 6.3 volts AC at 1.5A and 320/340 volts DC at 85 MA.

TUBES: Two each 5879, 6AQ5 and one 12AU7.

CIRCUIT: Four-stage with push-pull output. Tertiary winding feedback from secondary of output transformer to cathode of driver stage.

MECHANICAL: Cold rolled steel chassis, die formed and heavily plated. Size: $4\frac{1}{8}$ " x $11\frac{1}{2}$ " x $6\frac{5}{8}$ " high overall. One PWR-3 power supply, with one PWR-10 bias supply, will operate one or two of these monitoring amplifiers.



Monitoring amplifier with tubes	MON-4
Base and receptacle	BA-21
100% spare tube kit	TK-121

PWR-3 REGULATED POWER SUPPLY

USE: An unusually well regulated power supply with very low ripple content. Where used with MON-4 monitoring amplifier, the PWR-10 bias supply should be ordered. Bias supply not required for preamplifiers or program amplifiers.

CAPACITY: Will supply up to 26 PRE-4 preamplifiers, four PGM-4 program amplifiers, two MON-4 monitoring amplifiers or any combination of the above.

POWER: Supplies 6.3 volts AC at 8A, 310/350 volts DC at 0-160 MA. With PWR-10 bias unit added, supplies 15 volts DC at zero current. For 115 volts, 50/60 cycles. 230 volt design available on special order.

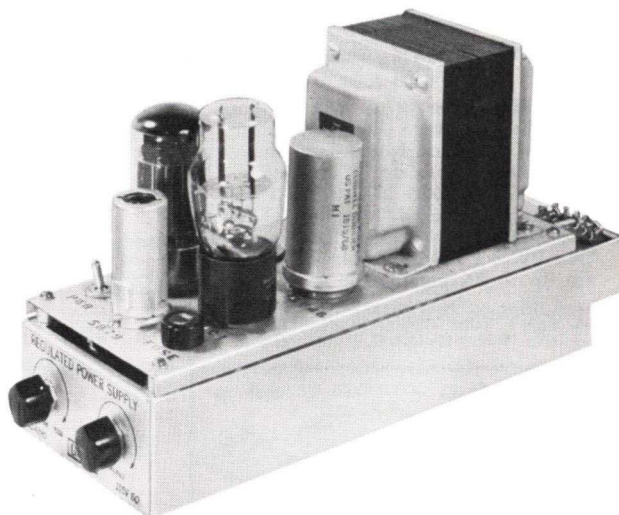
INTERNAL IMPEDANCE: Negligible.

INTERNAL REACTANCE: Negligible.

RIPPLE CONTENT: Less than 0.002 volts or 0.0006% through entire voltage range.

TUBES: One each 5V4G, 5879, 6080, and two OA2.

MECHANICAL: Cold rolled steel chassis, die formed and plated. Hum balance control on filament circuit and voltage output control on front. Size: $4\frac{1}{8}$ " wide, $11\frac{1}{2}$ " front to back, $6\frac{3}{8}$ " high. Mounts four in a panel and shelf assembly.



Power supply with tubes	PWR-3
Base and receptacle	BA-21
100% spare tube kit	TK-103



**PWR-10
BIAS SUPPLY**

Plugs into socket provided on PWR-3 regulated supply to provide bias voltage to one or two MON-4 monitoring amplifiers. Not required for preamplifiers or program amplifiers. Where bias supply is used this does not restrict power supply for use with monitoring amplifiers only. Amplifiers may be mixed as desired.

Bias supply	PWR-10
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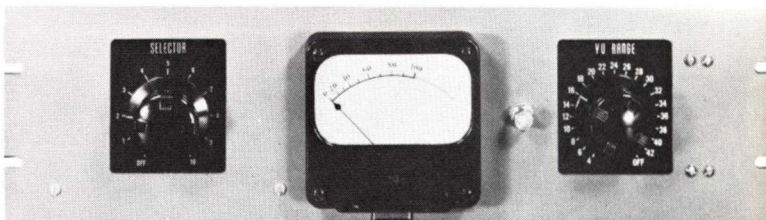
When Ordering Plug-In Equipment —

It is necessary to order the BA-20 or BA-21 base/receptacle unit for each amplifier. It is not necessary to order the base/receptacle unit where amplifiers or power supplies are purchased as spares. — All amplifiers are so well shielded that power supplies may be operated on the same panel and shelf assembly with only normal precautions necessary.

V-22 VU PANEL, SWITCH FUSE, AUDIO PATCH PANELS

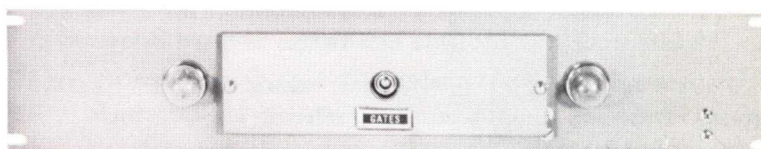
V-22 VOLUME INDICATOR

A complete range set with 10 position input select-or switch. In this way, all circuits to be measured may be switched in, including proof of performance. Meter is 4" illuminated. Range control in 2 VU steps from +4 to +42 VU. Input impedance 7500 ohms to bridge at 500/600 ohm line. Panel 5 1/4" x 19". Finish, medium gloss gray.

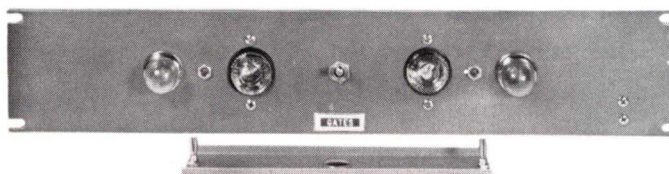


SWITCH AND FUSE PANEL

Used for turning On-Off all equipment in one relay rack. Two 30A plug fuses mount behind snap-on front panel.



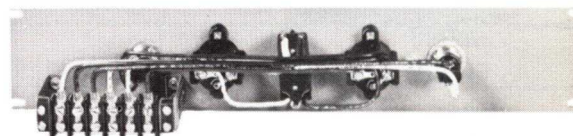
Includes indicator lamps and 15A switch.



Size: 3 1/2" x 19".

Finish: Medium gray.

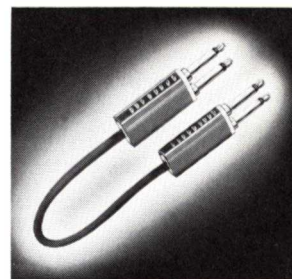
SWITCH PANEL M-4242



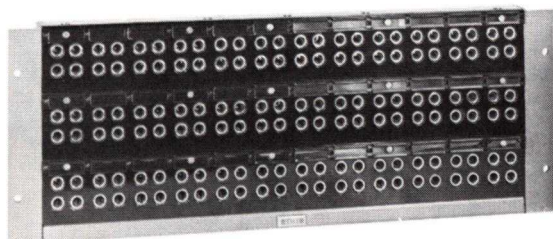
PATCH PANELS

Industry standard double patch assemblies. Jack strips listed separately from jack mats for ease in ordering. All jacks closed circuit type for normalling through audio circuits. Non-aging, non-ferrous metal assures long lasting spring tension. Contacts of silver alloy. Jacks held by molded bakelite, steel reinforced. Individual designation strips with slip-in holders for each pair of jacks.

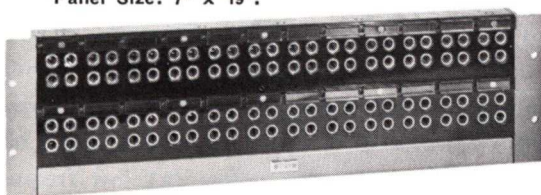
- Jack strip (24 jacks) with mounting brackets PJ-343
- Jack strip (48 jacks) less mat PJ-341
- Jack mat for one C-1500 jack strip PD1
- Jack mat for two C-1500 jack strips PD2
- Jack mat for three C-1500 jack strips PD3
- Patch cord 2' long PJ12
- Patch cord 3' long PJ13
- Patch cord 4' long PJ14
- Patch cord 5' long PJ15



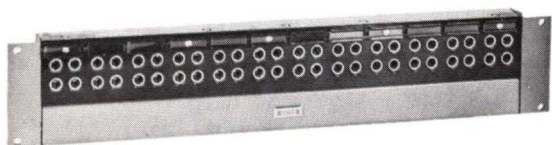
Patch cords available in four lengths. Double plugs each end. Shielded and covered with durable black braid plus extra reinforcement 6" from each end.



Above, three PJ-341 jack panels mounted on PD3 jack mat. Has 144 jacks (72 pairs). Panel Size: 7" x 19".



Above, two PJ-341 jack panels mounted on PD2 jack mat. Has 96 jacks (48 pairs). Panel size: 5 1/4" x 19".

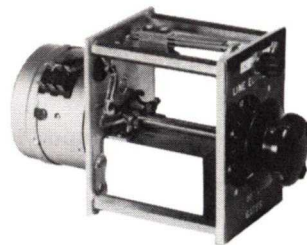
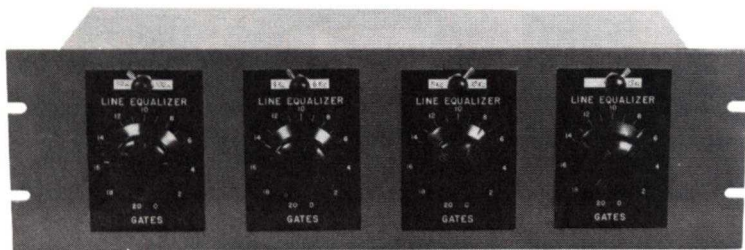


Above, one PJ-341 jack panel mounted on PD1 jack mat. Has 48 jacks (24 pairs). Panel size: 3 1/2" x 19".



Above, PJ-343 jack panel has 24 jacks (12 pairs). Size: 1 3/4" x 19". Does not require jack mat. End brackets for rack mounting supplied.

AUDIO EQUALIZERS — SOUND EFFECTS FILTERS

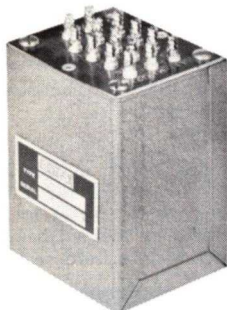


A precision equalizer available in 5 ranges as listed below. Has twenty 1 db steps. Consists of a high Q coil capacity tuned. Dual frequency units have selector key for each frequency. Dial indicates equalization in decibel variance from 1000 cycles. Several equalizers may operate in parallel without affecting the other. For operation across a 500/600 ohm circuit. Dial in black anodized. Easily panel mounted.

EQUALIZER FREQUENCY

30 cycles	SA-116
Dual, 50 and 100 cycles	SA-117
Dual 4000 and 6000 cycles	SA-118
Dual, 8000 and 10,000 cycles	SA-119
15,000 cycles	SA-120
Panel to mount four SA equalizers	SA-121

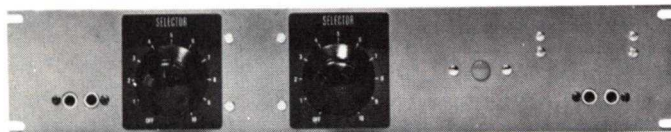
FIXED AND VARIABLE EQUALIZERS



MODEL LE-1: Shown to left is a fixed equalizer. A parallel resonant circuit operating with either a 150 or 600 ohm line. Equalization is varied by means of self-contained resistors in 1 ohm steps up to 111 ohms. Inductance is tuned by 0.05 mfd and 0.025 capacitors, also self-contained.

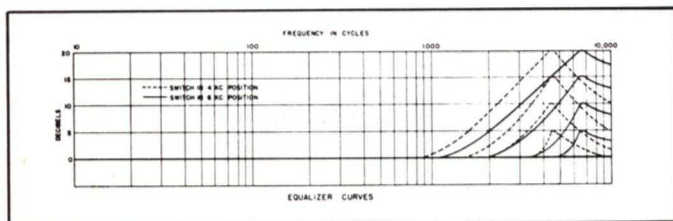
SIZE: 2 1/2" x 2 1/2" x 3". Ideal for equalizing telephone lines or any circuit requiring correction.

FIXED EQUALIZER LE-1



MODEL LE-2: Consists of the LE-1 equalizer with two variable controls, inserting the resistance in 1 ohm steps up to 111 ohms as required for full equalization. A double jack input is provided for direct parallel patching. Provision is also made for mounting a variable attenuator, sometimes desired in controlling line level. Panel Size: 19" x 3 1/2". Finish, medium gray.

VARIABLE EQUALIZER LE-2



SOUND EFFECTS EQUALIZERS

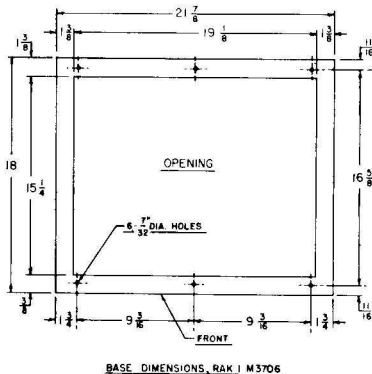


Ultimate in sound filters. Features wide frequency spectrum with overlapping cut-off frequencies, zero phase distortion, clickless steps of control, inductances toroidally wound and complete shielding for absence of hum pickup. Input level —70 to +28 dbm. Insertion loss, zero. Circuit constant, K. Available in two types: (a) low frequency cut-off, 10 positions of 70, 100, 150, 250, 500, 1000, 2000, 3000, 5000 and 7500 cycles, (b) high frequency cut-off, 10 positions of 300, 500, 1000, 2000, 3000, 5000, 6000, 7000, 8000 and 10,000 cycles. Provided with dial. Panel mounting. Size: 3 1/4" x 3 1/4" x 5" deep.

High frequency cut-off	FSE-1
Low frequency cut-off	FSE-2

RACK CABINET RAK-1

A unit system type of rack cabinet of open frame construction, having removable sides along with various shields, joiner trims and end bells. Similar to those found in RCA systems. Rack mounting strips are movable from front to back in 6 steps of $1\frac{1}{4}$ ". Basic frame includes 2 panel mounting angles, 2 terminal board mounting angles, full size rear door and panel mounting screws. Other accessories are as follows:



SINGLE CORNER TRIM TRM-1: Covers the rack mounting bolts on each corner. Two used for single cabinet or any number of cabinets.

DOUBLE CORNER TRIM TRM-2: Covers rack mounting bolts and joins two cabinets together. One used to join second cabinet to first, third to second, etc.

LARGE SIDE SHIELD SH-1: An electrical shield plate $15\frac{1}{8}$ " x 28" in size.

SMALL SIDE SHIELD SH-2: Same as SH-1 above only $15\frac{1}{8}$ " x 21" in size.

TERMINAL BOARD MOUNTING BRACKET BRK-1: Mounts at bottom rear of cabinet for the support of audio and power terminal blocks.

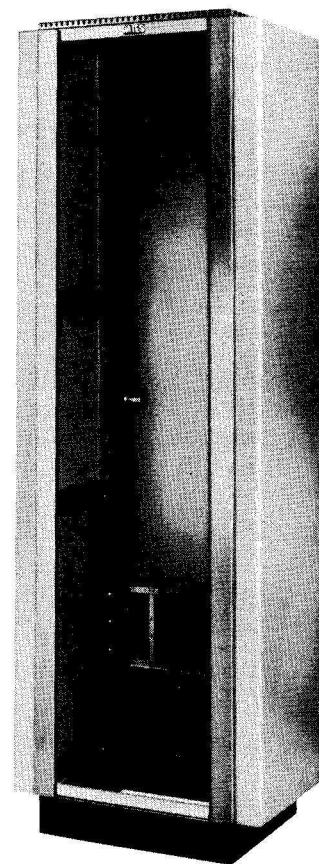
SIDE PANELS SP-1: Commonly known as end bell. Two used for single cabinet or any number of cabinets joined together.

SPECIFICATIONS

HEIGHT OVERALL: 84"
WIDTH (less SP-1 side panel): 22"
WIDTH OF SP-1 SIDE PANEL: 3"
DEPTH OVERALL: 21"
DOOR SWING: $22\frac{1}{2}$ "
PANEL SPACE: $19\frac{1}{2}$ " x 77"
MAXIMUM CLEARANCE BEHIND FRONT PANEL: 17"
PANEL MOUNTING: Standard rack multiples 12/24 mounting screws provided.
FINISH: Medium gloss gray.
NET WEIGHT RAK-1: 100 lbs.
SHIPPING WEIGHT: 195 lbs.

ORDERING INFORMATION

Basic Cabinet	RAK-1
Single Corner Trim	TRM-1
Double Corner Trim	TRM-2
Side Panel	SP-1
Shield	SH-1
Shield	SH-2
Terminal Board Mounting Bracket	BRK-1
Ventilating Fan	RAK-F-1



RACK CABINET RAK-7

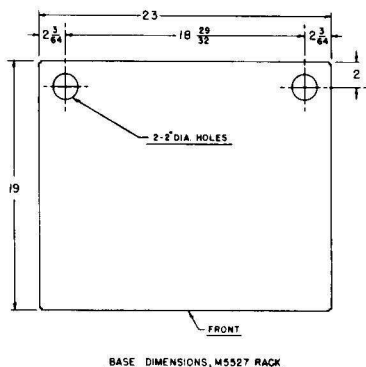
This new M-5527 is one of the finest rack cabinets in the economy field, and is suitable for all applications, including the mounting of tape recorders. Has solid sides, full size rear door with louvers at top and bottom. Finish is medium gray for both smart appearance and easy cleaning. — Standard cabinet is supplied with corner trim strips to cover panel mounting hardwood. M-5577 joiner trim is used when joining two cabinets together.

SPECIFICATIONS

DEPTH OVERALL: $19\frac{1}{2}$ "
DOOR SWING: $20\frac{1}{2}$ "
PANEL SPACE: $19\frac{1}{2}$ " x $71\frac{3}{4}$ "
CLEARANCE BEHIND PANEL: 17"
PANEL MOUNTING: Standard rack multiples 12/24 mounting screws provided.

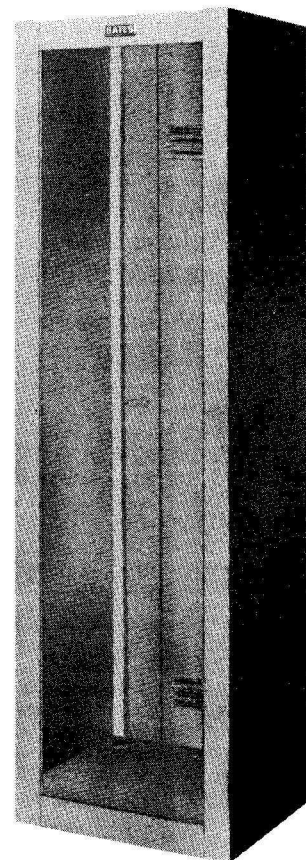
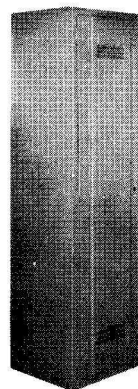
FINISH: Medium gray.
NET WEIGHT: 120 lbs.
SHIPPING WEIGHT: 140 lbs.

HEIGHT OVERALL: 78"
WIDTH OVERALL: $23\frac{1}{2}$ "



ORDERING INFORMATION

Rack Cabinet	RAK-7
Joiner Trim	M-5577



PROOF OF PERFORMANCE EQUIPMENT

CALIBRATED AUDIO OSCILLATOR

Measures audio frequencies between 30-30,000 cycles. No 0 reset or line calibration required. Self-contained power supply. Housed in attractive steel cabinet with carrying handle. Size: $13\frac{3}{4}" \times 7\frac{1}{4}" \times 9\frac{1}{2}"$.

SPECIFICATIONS

VOLTAGE OUTPUT: 10 volts into 500 ohms.

WAVE FORM: RMS harmonics at 3 volts on 500 ohm load, less than 1% all frequencies 50-15,000 cps.

RESPONSE: ± 1 db or better 30-15,000 cycles.

STABILITY: 1% or better.

CALIBRATION: $\pm 8\%$ of scale reading.

POWER: 115 volts, 50/60 cycles.

Model 200 B & W Audio Oscillator



NOISE AND DISTORTION METER

For measurements of noise and distortion — both audio equipment and radio transmitters. Variable frequency selective filter provides single frequency suppression circuit of 30-15,000 cycles range. Size $13\frac{3}{4}" \times 7\frac{1}{4}" \times 9\frac{1}{2}"$ in attractive metal cabinet and beautifully styled.

SPECIFICATIONS

FREQUENCY RANGE: (a) Distortion meter 30-15,000 cycles measuring harmonics to 45,000 cycles.

(b) Voltmeter and db meter 30-45,000 cycles.

SENSITIVITY: (a) Noise and distortion, 0.3 volts.

(b) Voltmeter, full scale readings, 0.3, 0.1, .03, .01 and .003 volts.

CALIBRATION: For distortion ± 0.5 db.

For voltage measurements $\pm 5\%$ of full scale at 1000 cps.

Model 400 B & W Distortion Meter



GAIN AND MEASURING SET

Ideal for use with above oscillator and distortion meter but may be used with any similar equipment. Consists of VU meter and associated switches to accommodate all usable ranges for measuring. Attenuation circuit includes a 10 step, 2 db per step, variable attenuator balanced ladder type, and three fixed plug-in pads. Pads are used for attenuation and impedance matching. Two pads have 40 db attenuation at 600/600 ohms and one has 20 db at 600/250 ohms, all balanced H. Additional pads of any loss or impedance obtainable on special order.

SPECIFICATIONS

INPUT IMPEDANCE: 600 ohms balanced.

OUTPUT IMPEDANCE: 30 to 600 ohms balanced.

OUTPUT LEVEL: Variable from -21 dbm to -36 dbm.

RESPONSE: $\pm 1/2$ db 30-15,000 cycles.

DISTORTION AND NOISE: Negligible.

Model M-3625 Gain Measuring Set



M-3626 Rectifier/Pickup Coil

Used with AM transmitters in conjunction with Model 400 distortion meter, listed above. Picks up RF from tank circuit for measuring noise and distortion. Includes RF pickup coil, 15-foot section of coaxial cable, and germanium diode. Complete RF filtering guarantees pure audio output which is free from RF disturbances.

FREQUENCY RANGE: 550-20,000 Kc.

RESPONSE: ± 1 db 30-15,000 cycles.

OUTPUT IMPEDANCE: 600 ohms.

OUTPUT LEVEL: $+12$ dbm.

Complete Proof of Performance Package

Consists of type 200 Oscillator, Type 400 Noise and Distortion Meter, M-3625 Gain Measuring Set, and M-3626 Rectifier Unit with RF pickup coil and transmission line cable. Complete package provides all facilities for proof of performance of both audio frequency and AM radio transmitters. Provided with this package is a complete instruction book covering not only instructions for operating the equipment but suggested methods in making proof of performance measurements that are accurate and reliable.

Model SA-131 Complete Proof of Performance Package

MICROPHONES



ELECTRO-VOICE MODEL 654

Functional slim-trim styling; similar to Model 655C in design, but for slightly less exacting applications. A high-quality unit for remotes, man-on-the-street shows, and all-around studio use. 50-to-15,000 cps. response. Recessed switch selects 50 or 250 ohms output at —55 db. Tilttable head; TV gray finish; 18' cable. XL-3 connector; $\frac{5}{8}$ " —27 thread. Size: 10" by 1". Net wt. 15½ oz.



ELECTRO-VOICE MODEL 655C

The finest TV-BC microphone — widest range commercially available, 40 to 20,000 cps. Widely used as laboratory standard. Outstanding for single-mike applications. 50, 150, 250 ohms at —55 db. Adjustable clamp-on stand mount, $\frac{5}{8}$ " —27 thread, $\frac{1}{2}$ " adapter. TV gray finish. 20' cable, UA-3 connector. Size: 10½" l., 1" dia. Net wt. 11 oz.



SHURE MODEL 315

This rugged high fidelity multi-impedance microphone is recommended for fine quality, general-purpose uses. Frequency response, 50 to 12,000 cps. Equipped with a multi-impedance switch, furnishing a choice of 3 impedances: L-30-50 ohms, M-150-250 ohms, H-High. Standard $\frac{5}{8}$ " —27 thread. 6" high, 1-7/16" wide, 1-3/32" deep.



ELECTRO-VOICE MODEL 664

A good medium-price cardioid. 40 to 15,000 cps response. 150-ohm and Hi-Z output at —55 db response. 150-ohm and Hi-Z output at —55 db. Chrome finish, cast case. 18' cable, MC-4 connector. 7-3/16" l., 1 7/8" dia. Net wt. 1 lb., 10 oz.



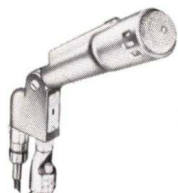
ELECTRO-VOICE MODEL 636

Fine general purpose microphone with style and quality of the Model 655C. 60 to 15,000 cps response. Hi and Lo-Z at —55 db. Tilttable head; On-Off switch; chrome finish. $\frac{5}{8}$ " —27 thread. 18' cable, MC-4 connector. 10¼" l., 1 1/8" dia. Net wt. 15 oz.



SHURE MODEL 556S

Specified by leading sound engineers and requested by famed celebrities — for those important events where the faithfulness of sound reproduction is most critical. Frequency response, 40 to 15,000 cps guaranteed to plus or minus 2½ db. Equipped with a Multi-Impedance switch, furnishing a choice of 3 impedances — L-30-50 ohms, M-150-250 ohms, H-High. New improved self-adjusting "positive action" lifetime swivel permits tilting of the head through 45° forward and 90° backward. Equipped with Cannon XL-3-11 connector. 7¾" high, 2-3/16" wide, 3-1/16" deep.



ELECTRO-VOICE MODEL 665

40 to 15,000 cps response. Recessed switch permits 50 or 250 ohms output at —55 db. Die cast case with nonreflecting gray finish. $\frac{5}{8}$ " —27 thread; 18' cable, XL-3 connector. Size: 7-3/16" l., 1 7/8" max. dia. Net wt. 1 lb. 10 oz.



ELECTRO-VOICE MODEL 635

"Workhorse of the industry" for remote pickups, announcing, studio work. 40 to 15,000 cps. response. Switch selects 50 or 250 ohms output at —55 db. Tilttable head; chrome finish. $\frac{5}{8}$ " —27 thread. 18' cable, XL-3 connector. Size: 2" by 6¼". Net wt. 1 lb.



ELECTRO-VOICE MODEL 647

Small, rugged, versatile. Response 60 to 10 kc, 150 ohms or Hi-Z (specify when ordering) at —57 db output. TV gray finish. Neck cord, clip, 18' cable, built-in connector. Size: 5" by 1" dia. Uses Model 300 clamp (not included) for stand use. Net weight 4 oz.



ALTEC MODEL 639

Broadcasters, recording engineers and public address users will find that the 639 is an invaluable microphone. The 639 is a cardioid microphone, with a frequency response of from 40 to 10,000 cycles. It is available in two models: 639A, with a 3-directional pattern, and the 639B, with a 6-directional pattern. Size: 7½" high, 3-7/16" wide, 4-7/16" deep.

ELECTRO-VOICE ACCESSORIES

ELECTRO-VOICE ENCLOSURES AND SPEAKERS



THE EMPIRE

Contemporary styling, functional design, and exceptional craftsmanship combine to provide an along-the-wall enclosure capable of superb musical reproduction. Accepts the speakers listed below. Available in mahogany, limed oak or walnut finish. Dimension 29 $\frac{5}{8}$ " high, 32" wide, 16" deep. Shpg. wt. 56 lbs.



MODEL 15TRX

An excellent three-in-one speaker system for full-range reproduction. Response 30 to 19kc in Empire enclosure. Crossover points, 2kc and 3.5kc. 16 ohms impedance. Magnet wt. 5 $\frac{3}{4}$ lbs. Includes level control. 15 $\frac{1}{8}$ " dia., 9 $\frac{1}{8}$ " deep overall. Shpg. wt. 48 lbs.



MODEL 15TRXB

Economy version of three-way Model 15TRX. Response 30 to 18kc in Empire. 16 ohms impedance. Magnet wt. 1 $\frac{1}{8}$ lbs. Includes level control 15 $\frac{1}{8}$ " dia., 7 $\frac{3}{8}$ " deep overall. Shpg. wt. 17 lbs.



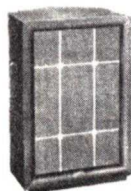
MODEL 848

Rugged, wide-range coaxial projector, for voice and musicasting. Coaxial performance in a weatherproof, blastproof fibreglass horn assembly. Response 200 to 10kc with wide-angle dispersion. 16 ohms impedance. 10 $\frac{1}{2}$ " wide, 20 $\frac{1}{2}$ " high, 20" deep. Shpg. wt. 17 lbs.



MODEL 847

Compact and efficient, similar to Model 848 in operation but for low-level applications. Response 300 to 10kc. 16 ohms impedance. 11 $\frac{3}{4}$ " wide, 7 $\frac{3}{4}$ " high, 10" deep. Shpg. wt. 7 lbs.



THE ARISTOCRAT

Unusually smooth reproduction from a modest size enclosure, when used with the speakers listed below. Specifically for room-corner placement. Crafted from the finest hardwood veneers; available in mahogany, limed oak or walnut finish. Dimension 29 $\frac{5}{8}$ " high, 19" wide, 16-5/16" deep. Shpg. wt. 44 lbs.



MODEL SP12

Clean, sparkling reproduction is provided by this efficient 12" coaxial speaker. Response 30 to 13kc in Aristocrat enclosure. 16 ohms impedance. 3-lb. magnet. 12 $\frac{1}{4}$ " dia., 7 $\frac{1}{2}$ " deep overall. Shpg. wt. 25 lbs.



THE BARONET

An excellent enclosure where space is limited. For room-corner placement on the floor or hang from the ceiling. Wide-range reproduction is assured using the Model SP88 listed below. Available in mahogany, limed oak or walnut finish. 22 $\frac{7}{8}$ " high, 14 $\frac{1}{2}$ " wide, 13 $\frac{3}{4}$ " deep. Shpg. wt. 20 lbs.



MODEL SP88

The perfect complement for the Baronet enclosure. Smooth peak-free response from 35 to 13 kc. 16 ohms impedance. 1-lb. magnet, 8 $\frac{3}{8}$ " dia., 4 $\frac{3}{8}$ " deep overall. Shpg. wt. 9 lbs.

MICROPHONE ACCESSORIES

MODEL 345 SHOCK MOUNT

Dual-type, prevents reproduction of external shocks, vibrations. Easily attached, removed. Chrome finish. $\frac{3}{8}$ "-27 thread. Size 3 $\frac{3}{8}$ " by 1 $\frac{1}{2}$ " dia. Net wt. 10 oz.



MODEL 346 SHOCK MOUNT

Similar to Model 345 but specifically for use with Model 666, other 11-oz microphones. TV gray finish.



MODEL 366 BOOM SHOCK MOUNT

Extremely light suspension shock mount. Designed for use with 666, 667, 655C, other 1" diameter microphones. No tools required for installation. Pictail cable connection (UA-3 connectors) forms cable shock-isolation loop.



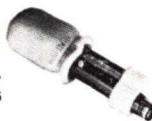
MODEL 300 MICROPHONE CLAMP

Lightweight adapter fits any 1" dia. mike, provides positive stand mount; finger-operated non-slip clamp. $\frac{3}{8}$ "-27 thread, $\frac{1}{2}$ " adapter.



MODEL 524 WIND SCREEN

Minimizes wind effects, boom or outdoor use. Made of Acoustiform rubber. For use with Models 666, 667. Net wt. 2 oz.



MODEL 335 BLAST FILTER

Acoustically treated to stop wind, breath blasts without affecting frequency response. For Models 630, 635, 605. Chrome finish.



ELECTRO-VOICE DESK STANDS

MODEL 418

Heavy die cast base, TV gray finish. For use with small-stud mikes such as Models 611, 623, 630, 635 and 636.



MODEL 418-S

Stand with on-off switch.

MODEL 419

Similar to Model 418 but for use with Models 654, 664, and 665.



MODEL 419-S

Stand with on-off switch.

MODEL 420

Heavy cast iron base, TV gray finish. With simple, positive finger-operated clamp. Mounts Models 666, 667, 655C, 646, other 1" dia. mikes. Net wt. 3 lbs.



MODEL 423-A

Sturdy, smartly styled. Round die cast base. 5 $\frac{1}{8}$ " dia., rubber base buttons. Chrome finish. Specify 3" or 5" stem riser. $\frac{3}{8}$ "-27 thread. Net wt. 1 lb.



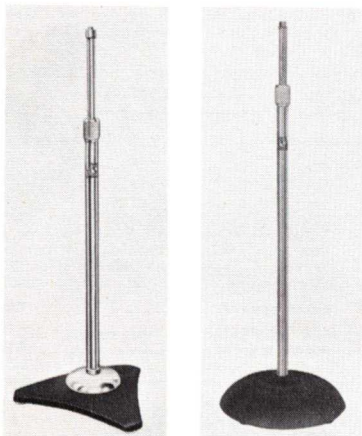
MODEL 428 TOUCH-TO-TALK STAND

Lever-type switch for relay operation or mike on-off. SPDT or DPDT switch (specify when ordering). Closes, opens instantly or locks in "talk" position. Chrome finish, gray plastic switch lever. Size: 7" by 5 $\frac{1}{8}$ " base dia. Net wt. 1 $\frac{3}{4}$ lbs.



ACCESSORIES

FLOOR STANDS



A floor stand with a big heavy base, listed to left above. Weight 24 lbs, and base 17" across. Adjustable to 66". Full chrome with gray base. $\frac{5}{8}$ " x 27 thread. Non-slipping clutch. Fits all microphones listed in this catalog.

Microphone Floor Stand MS-25

Here is a good medium-priced floor stand with a 10" diameter base, chrome pipe and gray base. Adjustable to 64" with $\frac{5}{8}$ " x 27 thread and non-slipping clutch. Weight 9 lbs.

Microphone Floor Stand MS-10C

BOOM BRACKET

A boom bracket to attach to any existing floor stand with $\frac{5}{8}$ " x 27 thread. 32" long, chrome plated. Counter balance adjustable for various microphones.

Boom Bracket BB-1

BOOM STANDS



Boom length 62" (more extension addable). Adjustable vertical extension 48"-72". Base diameter 17". Tubular sections super-chrome plated. Modernistic base finished in chrome and gun metal shrivel. "Snap On" hangers furnished to hold mike cable to boom section. Ship. wt. 33 lbs.

Boom Stand without casters BS-36

Boom Stand with silent casters BS-36W

DEMOUNTABLE FLOOR STAND



A completely demountable floor stand for easy, light weight portability, yet unusually strong and sturdy. Adjusts from 26-64". Finish, Chrome. $\frac{5}{8}$ " x 27 thread. Rubber cushioned feet. Weight, 4 lbs. Can be collapsed to length of 22 $\frac{1}{2}$ ".

Demountable Stand CS-33

DESK STAND



Adjustable 8" to 13" chrome stem and substantial cast base with felt feet. $\frac{5}{8}$ " x 27 thread.

Desk Stand DS-7



TS-6

BANQUET STAND

Adjustable 18" to 32", chrome stem and 8" diameter base. $\frac{5}{8}$ " x 27 thread. Full grip velvet action silent adjustment.

Banquet Stand TS-6



Sessions



Seth Thomas

STUDIO CLOCKS

SESSIONS clock has large sweep second hand and bold black numerals on a white dial. Size: 13 $\frac{1}{2}$ " diameter. Very accurate and time set is at bottom front. Finish gray, non-glaring, 115 volts, 60 cycles.

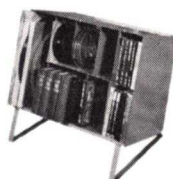
Sessions Electric Clock RB-89

SETH THOMAS. Thin design, bright chrome finish, convex glass with bold black lettering and easy to see second hand. Sets from front. This clock 15" in diameter with 12 $\frac{1}{2}$ " dial and only 1 $\frac{3}{4}$ " deep. 115 volts, 60 cycles.

Seth Thomas Electric Clock 602

RECORD-TAPE SERVICE CABINET

For the handling of records and transcriptions at the point of usage. To the top front are four compartments, 8 $\frac{1}{2}$ " high, 4 $\frac{1}{4}$ " wide and 7 $\frac{1}{2}$ " deep. At the bottom are two more compartments, 8 $\frac{1}{2}$ " high, 8 $\frac{1}{2}$ " wide and 7 $\frac{1}{2}$ " deep. At the left is a compartment, 17" high, 5" wide and 14" deep. This construction of compartments will handle 7", 10", 12" and 16" discs plus all size tape reels. At the top back is the discharge section for all size discs and tapes after usage.



Record-Tape Service Cabinet M-5611

HEAD PHONES



BRUSH DUAL CRYSTAL UNIT as illustrated. Smartly styled, unusually sensitive and dependable. For all professional service.

Dual Head Set BA-200

BRUSH SINGLE HEAD SET with head band. Otherwise same as dual unit above.

Single Head Set BA-201

TRIM DUAL HEAD SET, feather weight model, long recognized as an industry leader. Impedance 24,000 ohms.

Trim dual head set 107

TRIM S HEAD SET, particularly designed for broadcast use. Response substantially flat through all essential frequencies. Shell and cap molded plastic. Alnico V magnet. Floating diaphragm. Supplied with cushions. Impedance 600 ohms.

Trim S head set 35-3

STUDIO WARNING LIGHTS



An attractive and modern design light available in many different wordings. Lettering is on plexiglass and illumination is edge-wise, illuminating letters only. Size: 18" wide, 6 $\frac{1}{2}$ " from top of glass to base of lamp enclosure, 3" deep.

LETTERING

Studio A	CAT. NO.
Studio B	AM-1
Control Room	AM-2
On Air	AM-3
Special Lettering*	AM-4
	AM-5

* 12 or less letters or numbers



Non-shatterable 180° plastic prism lens, in red (standard), green, blue, amber and crystal. Panel may be flashed opal or translucent Lucite. Lettering of more than 16 characters may not be legible at required distances. Two rows of figures may be used; $\frac{3}{4}$ " maximum letter height. Frames are cast aluminum with hammer-tone finish in silver, gray and bronze. End caps are zinc, finished in decorative or satin chrome.

On-Air Warning Light QT-7

ACCESSORY EQUIPMENT



GE 12" Loudspeaker 1203A

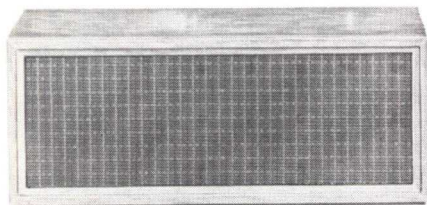


GE 6" SPEAKER CABINET

Features "distributed part" acoustical design for smooth, full low frequency response. For corner or straight wall placement. 31 1/4" high, 25 5/8" wide and 18 1/4" deep. Available in blonde, mahogany and unfinished. A beautiful cabinet in both performance and appearance, and modestly priced.

- GE speaker cabinet, blonde A1-406B
- GE speaker cabinet, mahogany A1-406M
- GE speaker cabinet, unfinished A1-406U

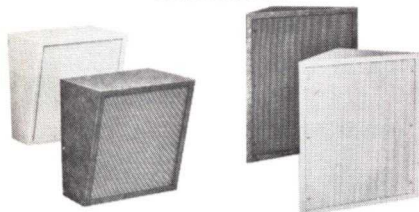
GE 8" SPEAKER ENCLOSURE



Only 10" high, this beautiful enclosure for 8" speakers may be mounted horizontally near the ceiling, on a shelf or vertically. Has "distributed part" acoustic design. A fine enclosure for audience or reception room. Size: 26" wide, 10" high and 11" deep.

- GE enclosure, blonde A1-412
- GE enclosure, mahogany A1-411
- GE enclosure, unfinished A1-414

WALL BAFFLES



Flat Mount

Corner Mount

For 12" loudspeaker and available in blonde or mahogany. Ideal for studio, reception room and general sound distribution.

- Flat wall baffle (blonde) DWB-12
- Flat wall baffle (mahogany) DWM-12
- Corner wall baffle (blonde) C12A-B
- Corner wall baffle (mahogany) C12A-M

CEILING BAFFLE

Spun aluminum, satin finish for 8" speaker provides 360° coverage. Mounts flush with ceiling. Ceiling baffle A18-A



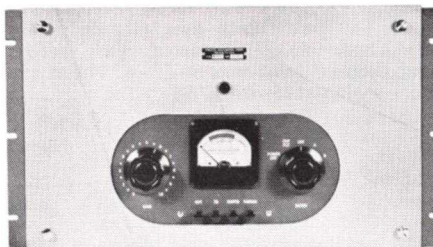
PRESTO 6N DISC RECORDER



The "Mr. Recorder" of the disc recording field. Illustrated in portable case but floor cabinet available for permanent use. Designed specifically for broadcasting station and recording laboratory. When used with the A93 amplifier, listed below, a wide variety of recording curves are possible and will meet all currently popular standards. Records at 33-1/3, 45, or 78 RPM. Feed screw supplied is 112 lines per inch inside to out. Feed screws of 96, 104, 120, or 136, either inside to out or vice versa, are available along with microgroove pictures of 244, 256 and 288. For 115 volts, 60 cycles. Cutting head impedance, choice of 15 or 500 ohms. Playback pickup 500 ohms.

- Recorder, chassis only 6N
- Recorder, in portable case (illustrated) 6NP
- Recorder, in floor cabinet 6NC
- Microgroove feed screw, 244 lines 32M

A93 RECORDING AMPLIFIER



Suggested for use with 6N recorder listed above. Provides 3 curves of: (1) flat, (2) phono recording, and (3) NARTB. Radius switch incorporated permits operator to compensate for loss of high frequencies at center of disc. Includes VU meter, range control and master gain. Power, 30 watts.

- Recording amplifier A93

PRESTO 1D CUTTING HEAD

Recognized as the finest in the disc recording field. Very low distortion and flat response from 50-10,000 cycles. Available in 16 or 500 ohms. Illustrated on Presto recorders listed above.

- Recording head, 16 ohms 1D-16
- Recording head, 500 ohms 1D-500

RECORDING STYLUS

Professional type, disc tested, for best possible recordings. State whether long or short shank when ordering.

- 87° sapphire, dural shank GR14-87
- 70° sapphire, dural shank GR14-70
- Microgroove sapphire, dural shank GR-20

SPEAKER MATCHING TRANSFORMERS

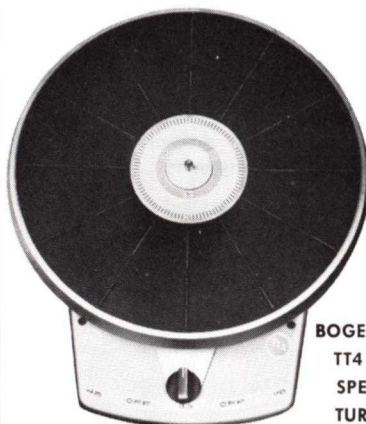
Primary adjustable to 500, 1000, 1500 or 2000 ohms. Secondary as stated below. Power handling 10 watts for ZY-2002 and ZY-4004 and 16 watts for ZY-2003.

- Matching transformer, Sec. 8 ohms ZY-2002
- Matching transformer, Sec. 4 ohms ZY-4004
- Matching transformer, Sec. 8 ohms ZY-2003

JENSEN PM SPEAKERS

This popular speaker is very modest in price and available in 8", 10" and 12" sizes. Voice coil 6-8 ohms. Power rating 8 watts on 8" and 10" models and 9 watts on 12" model. For general studio work with wall baffles and GE speaker enclosures, these models are excellent.

- 8" Jensen speaker P8S
- 10" Jensen speaker P10T
- 12" Jensen speaker P12T



BOGEN-PRESTO
TT4 THREE-
SPEED 12"
TURNTABLE

A new design, the TT4 plays all three speeds to perfection. Wow, flutter, and ramble are virtually non-existent. Constant speed hysteresis motor rotates balanced cast aluminum turntable. Interchangeable idler wheels disengage in "Off" to prevent flats. Exclusive "radial ridge" mat permits wide hole 45 rpm discs to seat properly without raising spindle. Built-in snap-action spindle retracts for new 7" 33-1/3 rpm discs.

Bogen-Presto T68AH three speed 16" turntable



BOGEN-PRESTO
T68AH THREE
SPEED 16"
TURNTABLE

The finest rim-drive 16" turntable today. Precise machinery insures trouble-free operation and practically non-existent wow, flutter, or hum. Aluminum turntables is padded with specially formulated rubber that cushions discs and affords perfect traction. Large positive-action speed selector has five positions (45, off, 33-1/3, off, 78) with separate idler wheel for each speed. Interchangeable idler wheels disengage when in the "Off" position and are easily replaced. Complete with 45 rpm adapter.

Three-speed 16" turntable T68AH

ACCESSORY EQUIPMENT

BULK TAPE ERASER



Bulk tape demagnetizer developing high intensity magnetic field. Erases recorded signals and noise completely and restores tape to like new condition. Handles 5", 7" and 10 1/2" reels. Adapter hub available (optional accessory) for 10 1/2" reels. 117 volts, 50/60 cycles.

Tape eraser HD-11

TAPE SPLICER



Cutter cartridges house 3 long life blades. Two operating positions, miter cut and trimming cut selected by knob. With clear plastic dust cover.

Gibson standard splicer TS4H

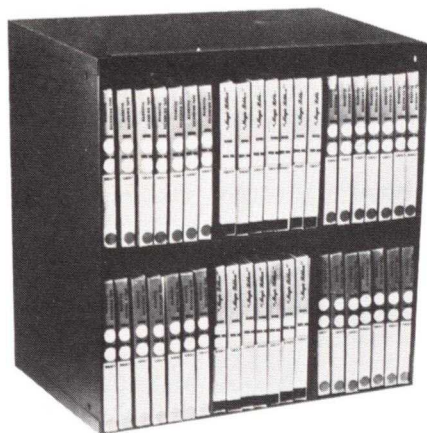
INDUSTRIAL TAPE SPLICER



For computer, TV and industrial tapes up to 1" wide. Long life, easily replaceable blades. Precise blade centering adjustment. Heavy cast base.

SIZE	Cat. No.
For 1/4" tapes	TS-250
For 1/2" tapes	TS-500
For 3/4" tapes	TS-625
For 1" tapes	TS-750
For 1 1/2" tapes	TS-1000

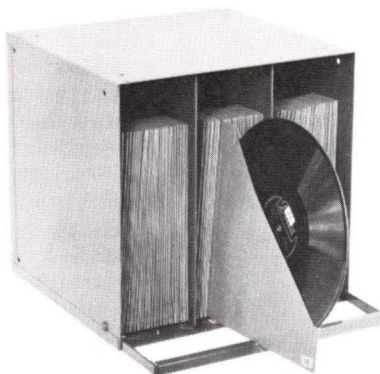
TAPE CABINETS



Holds 42 reel boxes of 7" tape reels. 13 1/8" wide, 12 5/8" high, 8 3/8" deep. Has six compartments. May be stacked as desired. TR-742

Holds 21 reel boxes of 10 1/2" tape reels. 13 1/8" wide, 12 5/8" high, 12" deep. Has three compartments. May be stacked as desired. TR-1021

SECTIONAL DISC CABINETS



All metal supplied with 90 heavy red wallet pockets, one for each record, two sets gummed numbers, 270 printed cataloging cards for 3-way cross index and steel card file.

Record Size	Width	Height	Depth	Pocket Cap.	Cat. No.
7"	13 1/8"	9"	12"	90	A-7
10"	13 1/8"	12 3/8"	12"	90	B-10
12"	13 1/8"	15 3/8"	14"	90	C-12
16"	13 1/8"	20 3/8"	20"	90	D-16



FILM CABINET

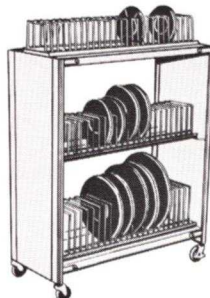
Closed top, base and sides. Open front and back. Equipped with separator racks adjustable to 1" centers. Gray enamel finish. Size: 30" wide, 75" high, 15" deep. Capacity: 44-400' reels, 20-600/800' reels. 1200/1600' reels. Size computed with reel cans.

Film Cabinet F50-6120

FILM REELMOBILE

Accommodates up to 27-400' reels, 25-600/800' reels and 25-1200/1600' reels. 3" moulded cushion-tread swivel casters, two with brakes, made of steel, finish gray. Film separator racks adjustable vertically on 1" centers. Size: 41 1/2" high, 15" deep and 36" wide.

Film Reelmobile RM-77



DIS CABINET

Protect those expensive and fragile 12" LP's as they should be. Holds 540 12" LP's with a heavy red wallet for each. Includes two sets of numbers, 1620 printed catalog cards and card file. Size: 60" high, 29" wide and 14" deep. Double door with lock and key.

Disc Storage Cabinet C-540



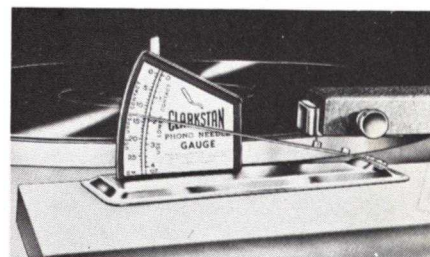
CONTROL ROOM CHAIR



Selected by Gates for comfort and utility in control room service. Smooth running, quiet caster, 180° swivel, adjustable height, form fitting back contour. Covering DuPont fabrilite. A strong serviceable chair to prevent fatigue.

Control Room Chair 255

STYLUS FORCE GAUGE

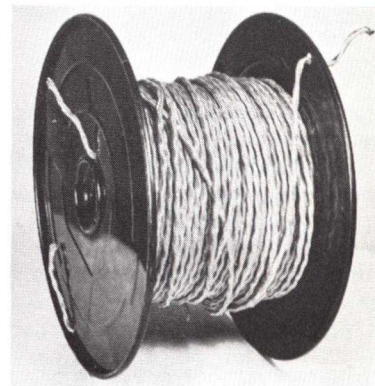


An inexpensive yet much needed item wherever transcriptions are used. Measures pressure in grams of stylus on record.

Stylus gauge 301

STUDIO AND MICROPHONE CABLE

Studio Cable



Shielded 2-conductor No. 20 stranded, cloth and heavy cotton fabric with tinned copper shield overall. Finest quality for studio audio wiring. Packaged in 250', 500' and 1000' lengths SH-20

Shielded 2-conductor No. 22 solid enameled, cotton wrap and cotton braid waxed. Tinned copper shield. Has 22 AWG tinned solid copper wire under shield and tubed chrome vinyl plastic jacket. Small size 0.185" diameter. Packaged 100', 500', 1000' spools 8440

A very small 2-conductor shielded cable frequently used in rack wiring. OD. 125". Has 2-conductor 16/36 stranded plastic insulation of each conductor with tinned copper shield overall. Packaged 250', 500' and 1000' spools 1261

Shielded 2-conductor No. 18 stranded for power cabling. Has rubber insulation and overall rubber jacket. OD 9.295". Available in 50' and 100' spools. 8428

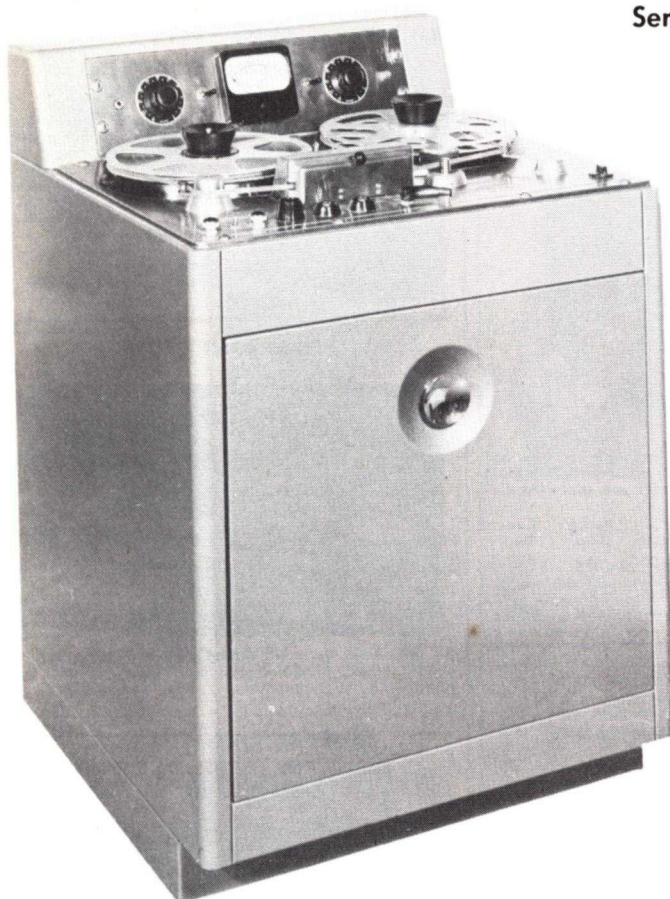
Microphone Cable

Rubber jacketed shielded highly flexible 2-conductor microphone cable of high commercial quality. Available any length as ordered. Per foot MIC-100

Single conductor shielded rubber jacketed microphone cable 8410

AMPEX PROFESSIONAL TAPE RECORDER

Series 300

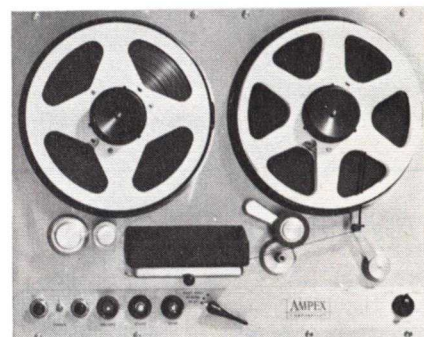


to serve as a temporary playback head, while the others are still recording. This permits recording sound-on-sound or adding a missing soloist to previously recorded music, all in perfect synchronization. It is SEL-SYNC on an 8-channel Ampex Series 300 that has enabled Les Paul and Mary Ford to make their world-famous recordings.

MODEL 300-2M: This is actually a two-channel machine especially designed to produce a four-track, half-inch, intermediate master. The master is used on the Ampex 3300 High-Speed Duplicator to produce 1/4" 4-track stereo tapes for commercial release.

SINGLE CHANNEL VERSION: Available as a single channel recorder in console, or unmounted for rack or portable installation, the Model 300 is unexcelled as a general purpose recorder. They are widely used in radio and professional recording studios throughout the world.

TAPE TRANSPORT



The uncompromising quality characteristics, both electronic and mechanical, inherent in the Ampex Series 300 result in superiority of performance and exceptionally long, trouble-free operation. Maintenance requirements, servicing needs, and out-of-service time are negligible or non-existent. For mechanical stability . . . rugged, precision manufacture . . . reserve operating capacities . . . and wide range recording abilities . . . the Ampex 300 is the recorder of preference for heavy, continuous service.

STEREOPHONIC RECORDING: The commercial recording industry has adopted three or four channels as the optimum in master stereophonic recording. Ampex Multi-Channel models are finding increasing use among professionals who wish to eliminate any possibility of the "hole-in-the-middle" effect. The three or four channel master is transferred to a two channel version for commercial release by mixing the middle channel or channels with the two outer channels.

TWO TO EIGHT CHANNEL Ampex Series 300 Recorders are available. Depending upon the number of channels involved, they can be ordered as consoles or unmounted for rack or portable installation. An Ampex 300 Recorder, purchased as a single channel version, may later be converted up to three channels with available kits. SEL-SYNC*. An exclusive Ampex feature that is optional on any Multi-Channel recorder, SEL-SYNC is a switching system that permits converting any of the recording heads

Three precision, heavy duty motors handle reels up to 14 inches in diameter, tapes up to 1 inch in width (the Ampex Series 300 are the only recorders that will accommodate more than one-half inch tape). Flutter and wow have been virtually eliminated due to rigid unit assembly, carefully designed precision capstan drive, massive flywheel and longer tape path. Tape skewing is non-existent; starts and stops are instantaneous.

CONTROLS: Record, Start and Stop buttons are recessed so that they will not be accidentally pressed; all can be remote controlled. A Fast Start/Slow Start switch allows the capstan motor to remain in "on" or "standby" position.

LONG-LIFE PRECISION HEADS: The rugged construction and carefully controlled fabrication assures uniform characteristics during their exceptionally long life. Ampex magnetic heads tested after 15,000 to 18,000 operating hours still meet published specifications in virtually every instance.

PRECISION ALIGNMENT: Ampex Multi-Channel recorders add an additional element of quality: the precision manufacture and alignment of the Multi-Channel heads. They are so perfect, so uniform, that tapes recorded on an Ampex Multi-Channel can be played with perfect results on any other Ampex Multi-Channel anywhere in the world without phase shift between channels.

AMPEX SERIES 300 PROFESSIONAL TAPE RECORDER

WIDE RANGE RECORDING

NEGLIGIBLE FLUTTER AND WOW: The requirements for the professional recording market—wherein the ultimate consumer may get up to the sixth generation recording—make it imperative that the master tape be free from flutter and wow. This can only be achieved through the Ampex 300 Recorders whose flutter and wow characteristics are so low as to be practically eliminated. Even when pyramided through several generations, flutter and wow are still far too insignificant to be audible.

FREQUENCY RESPONSE: Combining an essentially flat response from 30 to 15,000 cycles with a high signal-to-noise ratio, and the almost complete freedom from flutter and wow, results in master recordings of unsurpassed quality. And—Ampex Series 300 Recorders continue to deliver this ultimate in performance even after many years of continuous use.

THREE EQUALIZATIONS: NAB equalization is supplied on single channel models unless otherwise ordered. Multi-Channel versions are supplied with exclusive AME (Ampex Master Equalization) and NAB as standard equipment; CCIR equalization can also be ordered. The AME curve represents a considerable advance in master recording and gives an effective 7 db increase in signal-to-noise ratio over the 2,000 to 6,000 cycle range . . . thus reducing "subjective" tape hiss found in this frequency range. This lower noise level is particularly advantageous in producing the new 4-track stereo tapes.

MONITORING: An AB switch allows comparison of input and tape output by means of (1) a VU meter, (2) headphones plugged into the front panel, or by (3) a line connected to the studio monitor circuit.

SPECIFICATIONS

FREQUENCY RESPONSE: 15 ips = ± 2 db 30 — 15,000 cps.
 $7\frac{1}{2}$ ips = ± 2 db 40 — 10,000 cps.
 ± 4 db 30 — 15,000 cps.

SIGNAL-TO-NOISE RATIO: Peak record level to unweighted noise (db) $7\frac{1}{2}$ or 15 ips. 60 db = Full Track, 55 db = Multi-track.
 Peak record level defined as highest level at which overall (input to output) total rms harmonic distortion does not exceed 3% when measured on 400 cycle tone. Noise is measured when erasing signal of peak recording level in absence of new signal. Thus, bias and erase noise are included as well as playback amplifier noise. All frequencies measured from 50-15,000 cycles.

FLUTTER AND WOW: 15 ips — less than 0.2% rms, $7\frac{1}{2}$ ips — less than 1.2% rms. All frequencies measured from 0-300 cycles.

PHASING: All channels in phase when simultaneously recording and playing back a mid-frequency range test signal.

CROSS TALK REJECTION: 50 db on standard Multi-Channel models 60 db on 300-2M Special Master.

STARTING TIME: To full speed:

1/10 sec. for $\frac{1}{4}$ " tape,
 1/2 sec. for $\frac{1}{2}$ " tape

STOPPING TIME: 15 ips = —2" of tape past heads
 $7\frac{1}{2}$ ips = —1" of tape past heads

TIMING ACCURACY: 0.2% or ± 3.6 sec. for 30 min. recording

REWIND TIME: 1 min. approx. for full $10\frac{1}{2}$ " reel (2400 ft.)

CONTROLS: Stop, Start, Record — push button, relay operated; remote control optional.

Normal Play, Fast Forward, Rewind — on selector switch which may be changed from one mode to another without stopping in between. Multi-Channel recorders have separate button on electronics panel that energizes record relay for that channel only. Relay drops out when Stop button is depressed. Operation of Record button on tape transport actuates record relays on all channels.

MONITORING: Independent record and playback systems allow tape to be monitored while recording.

EQUALIZATION: Single channel: speed selector switch selects proper NAB equalization for the given speed.
 Multi-Channel: switch on electronics panel selects 7.5 NAB, 15 NAB or 15 AME.
 CCIR equalization available on special order.

INPUTS: Single channel: balanced or unbalanced +4VU bridging inputs.

INPUTS: Multi-Channel: switch selects low impedance microphone, balanced or unbalanced +4VU bridging inputs.

OUTPUTS: Single channel: 600 ohm, +4VU, (+4 DBM) balanced or unbalanced.

OUTPUTS: Multi-Channel: 600 ohm, +8VU, (+8 DBM) or +4VU, (+4DBM) by restrapping, balanced or unbalanced.

POWER INPUT REQUIRED: 117 volts, 60 cycles (also available for 50 cycles). Single Channel recorders require 3 amperes, add 0.5 amperes for each additional channel.

ORDERING INFORMATION

STANDARD MODELS: All with in-line heads; dual speed $7\frac{1}{2}$ and 15 ips.

Single channel, full track, $\frac{1}{4}$ " tape width Model 300

Two channel, $\frac{1}{4}$ " tape width . Model 300-2

Two channel, $\frac{1}{2}$ " tape width (special heads for four track masters) Model 300-2M

Three and four channel, $\frac{1}{2}$ " tape width, with or without SEL-SYNC Model 300-3 and 4

SPECIAL MODELS: 300-6 and 8—six and eight channel, 1" tape width, with or without SEL-SYNC. Special head configurations and operating speeds from $1\frac{7}{8}$ to 30 ips are also available.

MOUNTING: All models up to three channels available mounted in consoles, or unmounted for rack or portable installation. Four channel to eight channel available in console and rack combination, or uncased.

AMPEX PROFESSIONAL TAPE RECORDERS

Series 351

The Ampex Model 351 sets the highest standard in professional tape recording performance. Completely new inside, it combines the latest in circuits and electronics with Ampex superior tape handling characteristics.

SPECIFICATIONS

TAPE SPEEDS: $7\frac{1}{2}$ and 15 ips. or $3\frac{3}{4}$ and $7\frac{1}{2}$ ips.

FREQUENCY RESPONSE: All versions: 15 ips. ± 2 db
db 30 to 15,000 cps.

FREQUENCY RESPONSE: $7\frac{1}{2}$ ips. ± 4 db 30 to 15,000
cps. (± 2 db 40 to 10,000
cps.)
 $3\frac{3}{4}$ ips. ± 2 db 50 to 7,500
cps.

SIGNAL-TO-NOISE RATIO:

Speed	Max. Record Level to Unweighted Noise	Peak Record Level to Unweighted Noise
15"	Full track 70 db Half track 65 db 2 Channel stereo 65 db	Full track 60 db Half track 55 db 2 Channel stereo 55 db
$7\frac{1}{2}$ "	Full track 70 db Half track 65 db 2 Channel stereo 65 db	Full track 60 db Half track 55 db 2 Channel stereo 55 db
$3\frac{3}{4}$ "	60 db	50 db

FLUTTER AND WOW:

15 ips.	Well below 0.15% RMS.
$7\frac{1}{2}$ ips.	Well below 0.2% RMS.
$3\frac{3}{4}$ ips.	Well below 0.25% RMS.

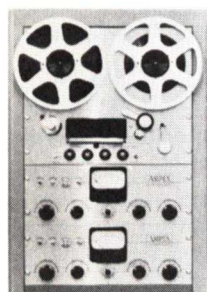
PLAYING TIMES:

With NAB Speed	Half Track	Full Track
$10\frac{1}{2}$ " reels 15 ips.	64 min.	32 min.
(2400 feet $7\frac{1}{2}$ ips.	2 hrs. 8 min.	64 min.
of tape) $3\frac{3}{4}$ ips.	4 hrs. 16 min.	2 hrs. 8 min.

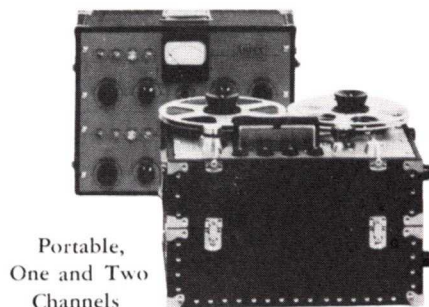
STARTING TIME: Instantaneous (tape accelerates to full speed in less than $1/10$ second).

STOPPING TIME: At 15 ips. speed, tape moves less than two inches after pressing "Stop" button.

PLAYBACK TIMING ACCURACY: $\pm 0.2\%$ (± 3.6 seconds in a thirty minute recording).



Unmounted
(Rack), One
and Two Channels



Portable,
One and Two
Channels



Console, One Channel Only.

REWIND TIME: Approximately one minute for 2400-foot NAB reel; 30 seconds for 1200-foot EIA reel. Rewind times for this base tapes proportionately longer.

CONTROLS: Tape motion controlled by four pushbuttons; Start, Stop, Fast Forward and Rewind. Separate Record button energizes record circuits, which drop out when machine is stopped. Individual Record button control for each channel in 2 Channel stereo machines. Motor speed and electronic equalization for various tape speeds are controlled by separate switches. Reel Size Switch provides proper tape tensions for NAB $10\frac{1}{2}$ " reels or EIA 5" and 7" reels.

RECORD INPUT: A switch allows recorder to accommodate either microphone level low impedance input or to bridge a 600 ohm line, balanced or unbalanced. Minimum input signal for recommended record level is -10 dbm balanced bridge, or -13 dbm unbalanced bridge. Levels as low as 150 microvolts on the microphone input will produce the recommended record level.

PLAYBACK: Plus 8 VU output into 600 ohms, balanced or unbalanced. Will feed a high input impedance amplifier directly with approximately two volts. Can be connected for +4 VU by restrapping.

AMPEX PROFESSIONAL TAPE RECORDERS

MODEL 351 SPECIFICATIONS (Con't)

AMPLIFIERS: Separate record and playback amplifiers are used. Amplifier distortion at any operating level is negligible compared to tape distortion, even using new high-output tapes.

PLUG-IN HEAD HOUSING: Erase, record and playback heads are contained in a single plug-in head housing.

MONITORING: Independent record and playback systems allow tape to be monitored while recording. A phone jack is provided to monitor either the record input signal before or during recording, or the output signal from the playback head while recording or during playback. An A-B switch is incorporated in order that direct comparison can be made between the original program and the recorded program. The same switch transfers a 4-inch VU meter for level comparison and monitoring. The VU meter is also used to read bias and erase current.

POWER REQUIREMENT: Either half or full-track machines require 2.0 amperes at 117 volts AC., 2 Channel stereo requires 2.5 amperes. Machines are available for either 50 or 60 cycle operation.

RACK SPACE: Standard 19 inch wide panel with commercial notching.
Tape Transport, 15 $\frac{3}{4}$ inches of rack space, weight 58 lbs.
Electronic Assembly, 7 inches of rack space, weight 18 lbs.
(Two required for 2 Channel stereo.)

CONSOLE DIMENSIONS: 48 inches high x 24 $\frac{1}{2}$ inches wide x 28 $\frac{1}{2}$ inches deep;
weight 168 lbs.
(crated 260 lbs.)

ORDERING INFORMATION

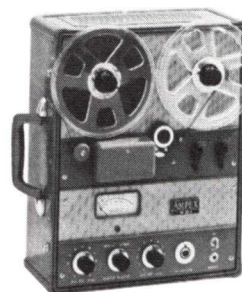
Mounting Style — Console, rack-mount or two case portable for Full or Half Track; rack, or portable for 2 Channel stereo **Model 351**

Tape Speed — 7 $\frac{1}{2}$ and 15 ips. or 3 $\frac{3}{4}$ and 7 $\frac{1}{2}$ ips.

Track Configuration — Full track, or half track, or 2 track stereo.

Power Line Frequency — 60 or 50 cps. (117 V. only).

AMPEX 601 PORTABLE TAPE RECORDER



This famous Ampex Portable fits your recording needs exactly.

LOW IMPEDANCE OUTPUT: 600 ohms, 1.23 volts. Balanced or unbalanced (from tapes recorded at program level).

LOW IMPEDANCE INPUT: Accommodates high or low impedance microphone. Low impedance microphone secured by accessory plug-in transformer.

INSTANTANEOUS STARTING: Accelerates to full play mode in less than one-fifth of a second.

SUPERB FIDELITY: Frequency response, 30 to 15,000 cps., at 7 $\frac{1}{2}$ in/sec. Down no more than 4 db at 15,000 $\pm$ 2 db from 40 to 10,000. Signal-to-noise ratio over 55 db. Flutter and wow — Below 0.17%. Separate erase, record and playback heads.

PRECISE TIMING: Synchronous motor drive. Timing accuracy within 3.6 seconds in its 30 minutes playback.

EASIEST OPERATION: Simple one hand "wrap around" threading. Large scale meter for accurate program levels. Can be monitored during either record or playback. Suitable for rack mounting.

DEPENDABLE SERVICE: Vital parts have been tested an equivalent of more than 10 years of normal broadcasting usage. "Lift-out" accessibility for maintenance.

ORDERING INFORMATION

Full or half-track. Portable case or unmounted chassis. 60 cycle operation (50 cycles available on special order). With or without, accessory low impedance input transformer, 17331-1 **Model 601**

AMPEX 620 AMPLIFIER-SPEAKER

Designed to match the Ampex 601



FIDELITY: Speaker and amplifier in combination have flat acoustic response from 65 to 10,000 cycles with additional useful range above and below.

POWER: Amplifier output is 10 watts with less than 1% harmonic distortion. Speaker can use full power if necessary, giving ample volume even for a medium size auditorium.

VERSATILITY: The Ampex 620 can amplify from any sound source. It may be used as an amplifier-speaker or as an amplifier only, since an external speaker jack bypasses the internal speaker and its reciprocal network.

ORDERING INFORMATION

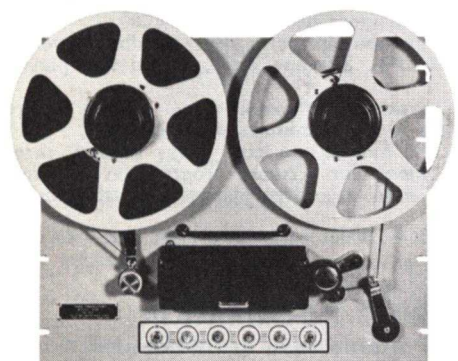
Ampex Amplifier-Speaker **Model 620**

TELECTRO PROFESSIONAL TAPE RECORDERS

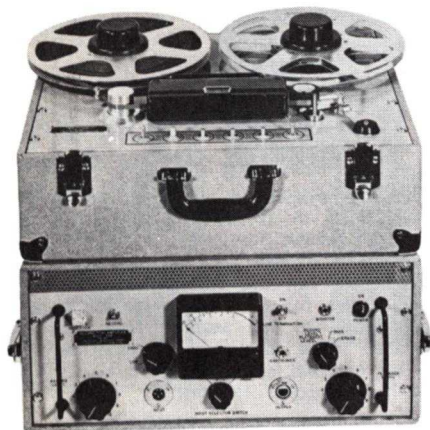
Model 938



Model 938-C



Model 938-R



Model 938-P

One of the finest commercial tape records and playback units manufactured today. Commercial equivalent to the much used Government Model AN/TNH-2B. Available in console, rack and portable two-case models.

Tape transport mechanism is a masterpiece of precision. Partial features include: (1) hysteresis synchronous motor, (2) dual torque motors for supply and take up reels, (3) adjustable take up torque, (4) self-aligning solenoid operated brakes, (5) heavy fly-wheel for low flutter, (6) automatic shut off switch, (7) push-button operation with easy remote control operation, (8) editing knobs, and (9) will rewind a full 10½" reel in one minute.

MECHANICAL AND ELECTRICAL SPECIFICATIONS

STARTING TIME: Less than 0.1 second.

STOPPING TIME: At 15 ips tape moves less than 2 inches after stop switch is operated.

PLAYBACK TIME: 1 hour at 7½ ips with standard 10½ inch NARTB reel for half-track recording; 2 hours using both tracks; up to 3 hours using long play tape.

PLAYBACK TIME ACCURACY: Better than 0.2%.

REWIND TIME: Less than 1 minute.

FAST WIND TIME: Less than 1 minute.

PLUG-IN HEAD ASSEMBLY: Dual track heads are standard. Soundhead assembly contains erase, playback and record heads. Available with single track heads.

MOUNTING AND INSTALLATION: Horizontal or vertical. Designed for either rack or console installation. Also available in handsomely designed carrying case.

WOW AND FLUTTER: Less than 0.15% rms at 15 ips. Less than 0.2% rms at 7½ ips.

POWER SOURCE: 115 volts, 60 cps.

POWER CONSUMPTION: 230 watts.

FREQUENCY RESPONSE: at 15 ips 30 to 15,000 ± 2 db.
at 7½ ips 30 to 15,000 ± 4 db.
at 7½ ips 30 to 10,000 ± 2 db.

SIGNAL TO NOISE RATIO: Over 55 db at both 7½ and 15 ips as defined by NARTB standards.

DISTORTION: Less than 2% rms at maximum recording level.

Less than 1% rms at standard recording level.

OUTPUT TERMINATION: 600 ohms balanced — termination switch is provided; monitor jack for connection to a power amplifier; jack for 600 ohms headset.

OUTPUT VOLTAGES: 0 VU or +4 dbm across 600 ohms balanced load or unbalanced load. 6 volts across 20,000 ohms.

INPUTS: Microphone Input — 30 to 250 ohms.

Bridge Input — 20,000 ohms.

INPUTS: Line Input — 600 ohms balanced, 600 ohms unbalanced.

MONITORING SWITCH: Rapid switching from monitoring tape playback to monitoring live input.

METER SWITCH: Provides rapid switching for indicating:

Playback level; Record level; Bias level; Erase Current.

METER: VU.

CONTROLS: Input jack, output jacks and meter — located on front panel.

ERASE OSCILLATOR: 85 kc adjustable. Screwdriver adjustment permits rapid setting of erase current level.

BIAS LEVEL: Screwdriver adjustment permits easy setting of bias level.

SIZES: (Console) 34" x 23" x 25½" deep.

(Rack) transport 19" x 15¾" x 5" deep.

Amplifier 19" x 7" x 14" deep.

(Portable) 2 cases 20" x 20" x 9" high.

ORDERING INFORMATION

Console model, full track, as illustrated	938-C
Rack model, full track, as illustrated	938-R
Two-cast portable model, full track, as illustrated	938-P

NOTE: All models available in half track at no extra cost, where stated on order. Stereophonic models also available.

MAGNECORD PROFESSIONAL TAPE RECORDERS

MAGNECORD M-90 SERIES



M-90ACC



M-90AC

The Magnecord M-90 incorporates the very latest advances in fine recording techniques. Quick slot-loading and interlocking push-button controls permit instantaneous selection of desired operation with safety and reliability. The tape is automatically lifted from the heads during rewind or "high forward" to reduce head wear to a minimum. Precision-made heads provide extended range to 20,000 cycles per second. High speed cueing control permits cueing during high forward or rewind. Record interlock minimizes danger of accidental tape erasure.

SPECIFICATIONS

TAPE SPEED: $7\frac{1}{2}$ & 15 ips ($3\frac{3}{4}$ and $7\frac{1}{2}$ ips available on special order).

STARTING TIME: less than 0.1 sec.

STOPPING TIME: less than 2" of tape at 15 ips.

TIMING ACCURACY: ± 3 sec. in 30 min.

FLUTTER & WOW: less than 0.1% max. at 15 ips, less than 0.15% max. at $7\frac{1}{2}$ ips less than .3% max. at $3\frac{3}{4}$ ips.

REWIND AND HIGH FORWARD: 10"—2400 ft. reel less than 55 sec.

FREQUENCY RESPONSE: 30 to 15,000 ± 2 db 15 ips, 40 to 12,000 ± 2 db $7\frac{1}{2}$ ips 30 to 15,000 ± 4 db $7\frac{1}{2}$ ips, 50 to 7500 — $3\frac{3}{4}$ ips.

SIGNAL-TO-NOISE: *58 db at $7\frac{1}{2}$ and 15 ips.

MONITORING: phone jack on panel for monitoring.

PANEL: standard 19-inch rack.

SIZE AMPLIFIER: 19 x $5\frac{1}{2}$.

TRANSPORT SIZE: 19 x $12\frac{1}{4}$.

POWER SUPPLY SIZE: integral with amplifier panel.

POWER CONSUMPTION: 290 watts.

M-90ACC: Net Wt.: 180 lbs. Size: 28" wide x 28" deep x 41" high.

M-90AC: Net Wt.: 92 lbs.

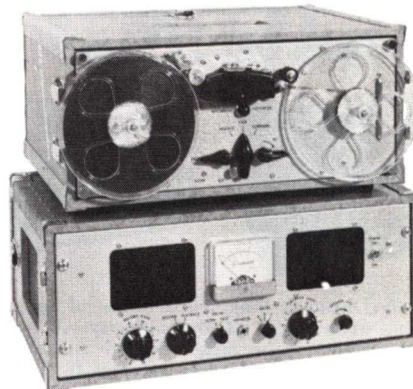
M-90ACX: Net Wt.: 74 lbs. Size: 19" wide x $17\frac{1}{2}$ " high.

* S/N for $\frac{1}{2}$ track is 55 db.

ORDERING INFORMATION

Console model includes transport and amplifier in beautiful cabinet 28" wide, 28" deep and 41" high	M-90ACC
Portable model in two cases including transport and amplifier	M-90AC
Rack model includes transport and amplifier for rack mounting	M-90ACX

MAGNECORD PT63 SERIES



For faithfully recording and reproducing any frequency in the audio range, the Magnecord PT63 has won nation-wide popularity, as well as for its longevity and dependability in service. Separate erase, record and playback heads allow monitoring from the tape. Full or half-track heads should be specified as desired. Two-speed motor and capstan change give speeds of $3\frac{3}{4}$ and $7\frac{1}{2}$ ips or $7\frac{1}{2}$ and 15 ips. Frequency response is from 50 to 15,000 cycles ± 2 db at 15 ips.

The popular and versatile PT63-J Amplifier Unit combines separate record and playback amplifiers, with a full 10 watts of audio power. Five-inch monitor speaker as well as outlet for connecting external speaker. Three inch VU meter for bias record and playback. Microphone input 50 or 250 ohms balanced or unbalanced. Bridge input, unbalanced. Switch for equalization of 15 and $7\frac{1}{2}$ ips ($3\frac{3}{4}$ ips equalizer available at additional charge). Phone jack from tape or input. Line output, 600 ohms 12 dbm balanced; speaker output, 4 or 16 ohms, 10 watts.

ORDERING INFORMATION

Basic recorder in portable carrying case	PT63-A2HZ
Recorder less case	PT63-A2HZX
Case	91X3318
Record-playback amplifier in case. Includes connector cables	PT63-J
Same, less case	PT63-JX
Case	91X1890

MAGNECORD PROFESSIONAL TAPE RECORDERS

MAGNECORD MODEL 728



Recording perfection and brilliant reproduction are combined in this portable Magnecord, the professional model 728.

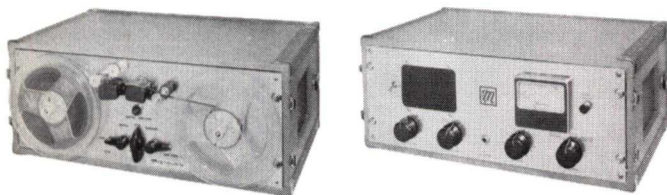
SPECIFICATIONS

TAPE SPEEDS: Two speeds, direct drive. $7\frac{1}{2}$ ips and 15 ips or $3\frac{3}{4}$ ips and $7\frac{1}{2}$ ips available.
TIMING ACCURACY: ± 3 seconds in 30 minutes.
FREQUENCY RESPONSE: 30 to 18,000 cps, ± 2 db at 15 ips.
FLUTTER AND WOW: 0.1% at 15 ips; 0.15% at $7\frac{1}{2}$ ips.
REEL SIZE: Up to $10\frac{1}{2}$ inches NAB.
PANEL SIZE: $17\frac{5}{8}$ " wide x $12\frac{7}{8}$ " high.

ORDERING INFORMATION

Magnecord Recorder Model 728

MAGNECORD PT6 SERIES



The PT6-6AJ has through long, hard hours of operation proven itself to be the work horse of the industry. A new, 19" front panel allows the PT6-6 to be rack mounted as well as carried in a portable case. Housed in two separate cases for convenience, the PT6-6 becomes the most practical professional portable in the field.

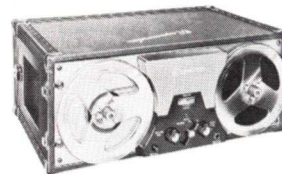
SPECIFICATIONS

FREQUENCY RESPONSE: 50 to 15,000 cps ± 2 db at 15 ips.
 50 to 7,500 cps ± 2 db at 7.5 ips.
INPUT LEVEL: Sensitivity — 105 dbm for zero level recording.
 Maximum level — 35 dbm.
INPUT IMPEDANCE: 50 ohm balanced. High impedance bridge (phone jack).
SIGNAL TO NOISE RATIO: 50 db.
TOTAL HARMONIC DISTORTION: 10 watts out, less than 2%.
FLUTTER: .3% at 15 ips. .5 at $7\frac{1}{2}$ ips.
DIMENSIONS: Amplifier — 8" deep, 7" high, 19" wide without carrying case. 13" deep, 8" high, 20" wide with carrying case.
MECHANICAL UNIT: 11" deep, 7" high, 19" wide without carrying case.
WEIGHT: Amplifier — 21 lbs. with carrying case.
TRANSPORT: 26 lbs. in case.

ORDERING INFORMATION

Recorder in Case PT6-6A
 Recorder Less Case PT6-6AX
 Carrying Case for Recorder 7A
 Record/Playback Amplifier in Case PT6-6J
 Record/Playback Amplifier less Case PT6-6JX
 Amplifier Case 7C

MAGNECORD S36-B



Here is a widely used professional tape recorder in the low priced field for real commercial results. Single unit has Hi-Z microphone and unbalanced bridging input. Playback amplifier output; 600 ohms balanced or unbalanced. Output level; +8 VU. Response 50-15,000 cycles. Tape speeds $7\frac{1}{2}$ " and 15" by capstan change. Hysteresis synchronous motor drive. Uses 7" reels. Rewinds in 40 seconds. Illuminated VU meter. Wow flutter 0.3%. Full track NAB response. Panel 7" x 19" for rack mounting.

ORDERING INFORMATION

Tape recorder rack mount S36-BX
 Same as above in portable carrying case S36-B

RECORDING TAPE

(Minnesota Mining & Mfg. Co.)

Recording tape is carried in generous quantity at all Gates stock carrying points. Rapid turnover assures fresh stock at all times. Recording tape is prepaid to any place in the United States and quantity places are lower (see price list). Unless otherwise stated, all tape is of Minnesota Mining manufacture.

SIZE	CAT. NO.
Type 111 plastic base, red oxide coating:	
$\frac{1}{4}$ " x 150' plastic 3" reel	111-1.5
$\frac{1}{4}$ " x 300' plastic 4" reel	111-3
$\frac{1}{4}$ " x 600' plastic 5" reel	111-6
$\frac{1}{4}$ " x 1200' plastic 7" reel	111-12
$\frac{1}{4}$ " x 2400' on hub	111-24H
$\frac{1}{4}$ " x 2400' on $10\frac{1}{2}$ " metal reel	111-24R
$\frac{1}{4}$ " x 4800' on hub	111-48H
$\frac{1}{4}$ " x 4800' on 14" metal reel	111-48R
Type 120 high output plastic base, green coded:	
$\frac{1}{4}$ " x 600' plastic 5" reel	120A-6
$\frac{1}{4}$ " x 1200' plastic 7" reel	120A-12
Type 190 new thin type, 50% more recording time per reel:	
$\frac{1}{4}$ " x 900' plastic 5" reel	190-9
$\frac{1}{4}$ " x 1800' plastic 7" reel	190-18
$\frac{1}{4}$ " x 3600' NARTB $10\frac{1}{2}$ " metal reel	190-36R
$\frac{1}{4}$ " x 3600' on hub	190-36H
$\frac{1}{4}$ " x 7200' on 14" metal reel	190-72R
$\frac{1}{4}$ " x 7200' on hub	190-72H
Type 150 weather balanced extra play:	
$\frac{1}{4}$ " x 900' on 5" plastic reel	150-9
$\frac{1}{4}$ " x 1800' on 7" plastic reel	150-18
$\frac{1}{4}$ " x 3600' on hub	150-36H
$\frac{1}{4}$ " x 3600' on $10\frac{1}{2}$ " metal reel	150-36R
$\frac{1}{4}$ " x 7200' on hub	150-72H
$\frac{1}{4}$ " x 7200' on 14" metal reel	150-72R
NEW 200 DOUBLE PLAY TAPE:	
$\frac{1}{4}$ " x 2400' on 7" reel	200-24
$\frac{1}{4}$ " x 4800' on $10\frac{1}{2}$ " NARTB metal reel	200-48R
SPECIAL TAPES:	
Splicing tape $\frac{1}{2}$ " x 150'	41- $\frac{1}{2}$ S
Leader timing tape, $\frac{1}{4}$ " x 150'	43-1.5
Head alignment tape 15" sec.	200
Head alignment tape $7\frac{1}{2}$ " sec.	GR-LST
EMPTY REELS WITH MAILING CARTONS:	
3" empty reel	RB-3
4" empty reel	RB-4
5" empty reel	RB-5
7" empty reel	RB-7
$10\frac{1}{2}$ " empty reel	RB-10- $\frac{1}{2}$ M

Quantity prices shown on price list —
 all tape prepaid anywhere in U. S. A.