

**FM**

**the soundest sound in FM is  
the new sound of Gates . . .**

**HARRIS  
INTERTYPE  
CORPORATION**

**GATES**

*A Subsidiary of Harris-Intertype Corporation*  
QUINCY, ILLINOIS

**HARRIS**  
**INTERTYPE**  
**CORPORATION**

# GATES RADIO COMPANY

A DIVISION OF HARRIS-INTERTYPE CORPORATION

123 HAMPSHIRE STREET • QUINCY, ILLINOIS 62301 • 217-222-8200

February 21, 1972

Mr. Dave Wickham  
Chief Engineer  
Radio Station W O C R  
Hewitt Union  
Oswego, New York 13126



Dear Mr. Wickham:

Thank you for your request for information and pricing on Gates equipment for an FM radio facility.

Enclosed is our FM Fact File, which contains brochures on various Gates products and a typical proposal for a 10 watt station. This listing is simply an equipment guide which may be altered according to your requirements.

For further information, may I suggest you contact our District Manager for your area, Mr. Robert Hallenbeck, whose card is attached. He will be happy to discuss your equipment requirements.

If I can be of further assistance, please feel free to contact me at any time.

Cordially yours,

*Holland O. Looper*

Holland O. Looper  
Broadcast Sales Specialist

ROL:mk  
Enc

cc: Robert Hallenbeck

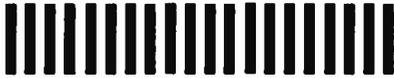
P.S. I am requesting our representative, Mr. Hallenbeck, with you as soon as possible.



Thank You

FROM \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

U. S. POSTAGE  
**PAID**  
Quincy, Illinois  
Permit No. 1



**BUSINESS REPLY ENVELOPE**  
No Postage Stamp Necessary If Mailed In The United States

POSTAGE WILL BE PAID BY:

ORDER DEPT.

**GATES RADIO COMPANY**

123 Hampshire Street  
Quincy, Illinois • 62301

*Did You Enclose Your Check?*

**SALES TAX**

Please include all applicable sales taxes, city, county, and state; or if you have a Sales Tax exemption, show number in the comment section on the reverse side.

**OPEN ACCOUNT**

Open account net payment due 30 days after shipment. If establishing an open account with Gates, please include the name of your bank in the comment section provided. Please allow a minimum of 15 days for establishing an account.

**TIME PAYMENT PLAN**

A modest monthly finance charge is applied on the balance to be financed, and shipment will be made promptly as soon as your documents have been signed and accepted and acknowledged by Gates.

**YOUR ORDER** will be carefully checked by highly qualified and well trained experts in broadcast equipment. We want to give your order prompt and careful handling. You can help by giving us complete and accurate information on your equipment needs. Whenever possible, order by Gates catalog numbers. Where applicable, specify "Operating Frequency" — "Tape Speed" — "Meter Scale Range" — "Voltage and Current Ratings" or any other technical data we may need to fill your order. When ordering replacement parts for Gates equipment you should give us the Model No. "(M-5025)" — part designation "(T201)" and drawing no. (DWG-062375609) in instruction book, with this information your order can be on its way in a few hours.

We pack your delicate electronic equipment carefully in approved cartons and crates. All shipments are insured. Should your order be damaged in transit, report the damage and file a claim immediately with the carrier. To avoid delay, do not return the damaged equipment to Gates unless authorized. Thank You.

EQUIPMENT LIST  
FOR  
EDUCATIONAL FREQUENCY MODULATION  
BROADCAST STATION  
USING 10 WATT TRANSMITTER

Prepared by -

Product Marketing Department  
Gates Radio Company  
Quincy, Illinois

This presentation has been prepared to assist you in the planning of an educational FM broadcast facility. This is not the only possibility, but a guide which may have any number of substitutions.

We have made every effort to include all items that might be required to construct an educational station, many of which can be easily overlooked. We hope that this thoroughness will be helpful.

We strongly recommend a contingent order policy for those who are filing with the F.C.C. for a new FM station. Our District Manager will gladly explain the advantages and prepare a contingent order form in accordance with this proposal, or any revision that you may desire, and submit it to you for signature. There is no obligation of any kind to take delivery of equipment until a construction permit is issued by the F.C.C.

TRANSMITTER

1	Gates Model BFE-10C, 10 Watt FM Broadcast Transmitter	\$1,495.00
1	100% Set Spare Tubes for BFE-10C Transmitter, TK-391	54.00
1	NE-91 Spare Oven and Crystal for BFE-10C Transmitter	87.50
		<hr/>
		\$1,636.50

ANTENNA EQUIPMENT

1	Gates FM-11 Single Ring Antenna, Power Gain .8	\$210.00
	(Optional - to replace FM-11 above, Gates FM-22, 2-Ring Antenna, Power Gain 1.6 @ \$420.00)	
100Ft.	Type RG-8A/U Coaxial Cable	23.00
1	PL-259A UHF Cable Plug (to terminate coax at antenna)	1.53
1	Type N Connector (transmitter end)	2.50
		<hr/>
		\$237.03

NOTE: Mounting pole not included with above antennas. 2" diameter pipe, or equivalent, required.

STUDIO EQUIPMENT

1	Gates Studioette 80 4-Channel Monaural Transistorized Console	\$1,295.00
2	CB-77, 12" Turntable @ \$199.50	399.00
2	M-6244B Transistor Preamplifier @ \$130.00	260.00
2	M44-7 Shure Phono Cartridge @ \$19.95	39.90
2	Gates TA-12 Tone Arm @ \$69.50	139.00
2	Gatespeakers GRS-8, 8" PM Type @ \$8.95	17.90
2	Speaker Matching Transformers for GRS-800 @ \$5.25	10.50
2	DWB-8A Wall Cabinets for Speakers @ \$6.40	12.80
1	Gates G-700 Microphone	57.50
1	Gates G-600 Microphone	48.50
1	Atlas BS-36 Boom Stand	59.85
1	Atlas MS-25 Floor Stand	24.00
1	Atlas DS-7 Desk Stand	4.92
2	Cannon XLR-3-35 Wall Receptacle for Microphones @ \$7.10	14.20
3	Cannon XLR-3-12C Microphone Plugs @ \$1.90	5.70
3	Cannon XLR-3-11C Connectors @ \$2.15	6.45
100Ft.	Belden 8412 two-conductor #20 Microphone Cable, rubber jacketed @ 26¢ per ft.	26.00
1	Trimm Type 107 Headphone	7.20
1	No. 511 Phone Plug for Headphone	.80
500Ft.	SH-2-20 Two-conductor Shielded Audio Wire @ \$.06 per ft.	30.00
		<hr/>
		\$2,459.22

111871

T O T A L S

Transmitter \$1,636.50

Antenna Equipment 237.03

Studio Equipment 2,459.22

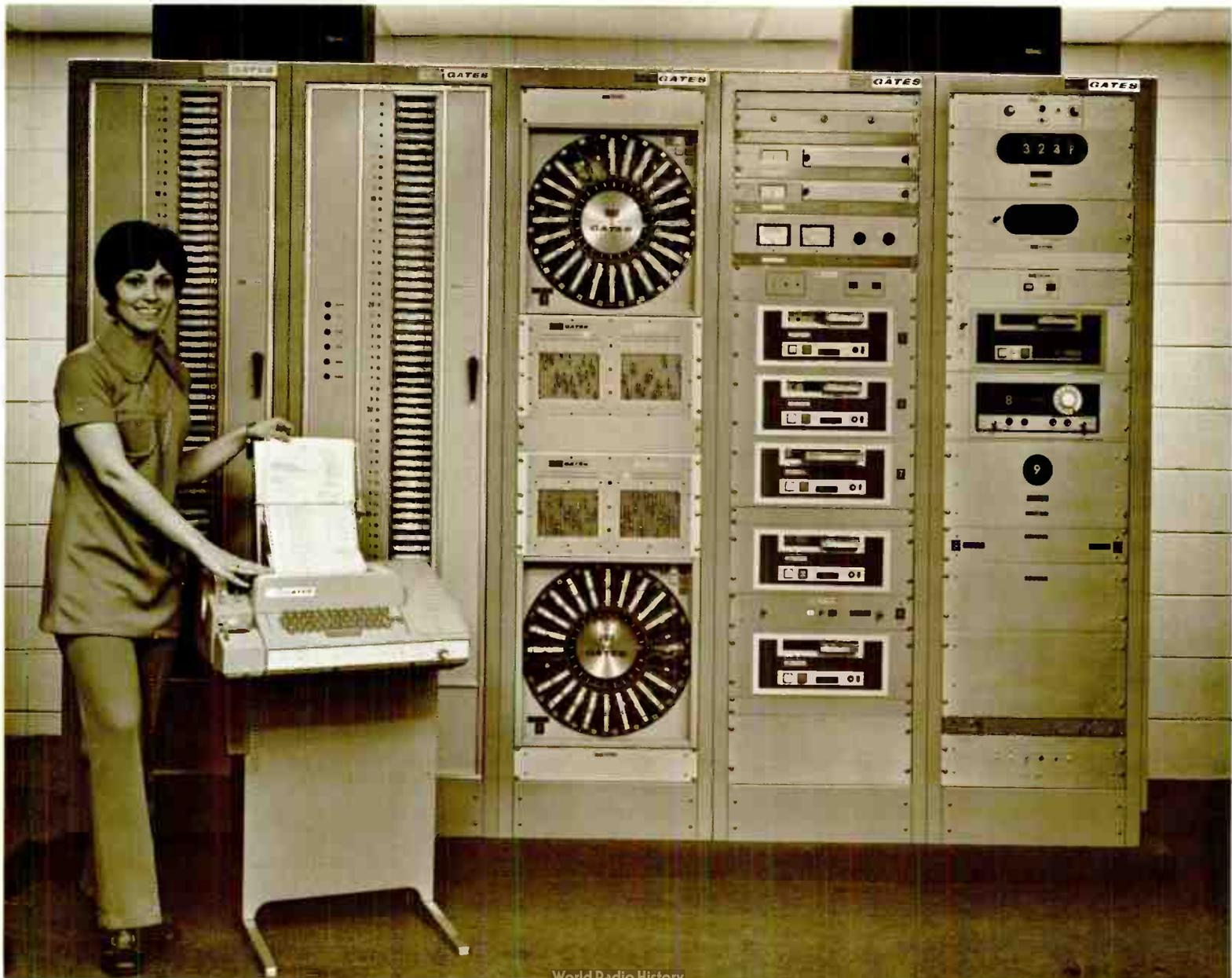
TOTAL, FOR 10 WATT EDUCATIONAL  
FM BROADCAST STATION ..... \$4,332.75

PRICES F.O.B. QUINCY, ILLINOIS

GATES RADIO COMPANY RESERVES THE RIGHT TO CHANGE  
PRICES AND SPECIFICATIONS WITHOUT NOTICE.

# GATES

PROGRAM  
AUTOMATION  
SYSTEMS  
AND  
EQUIPMENT



# Program Automation Systems

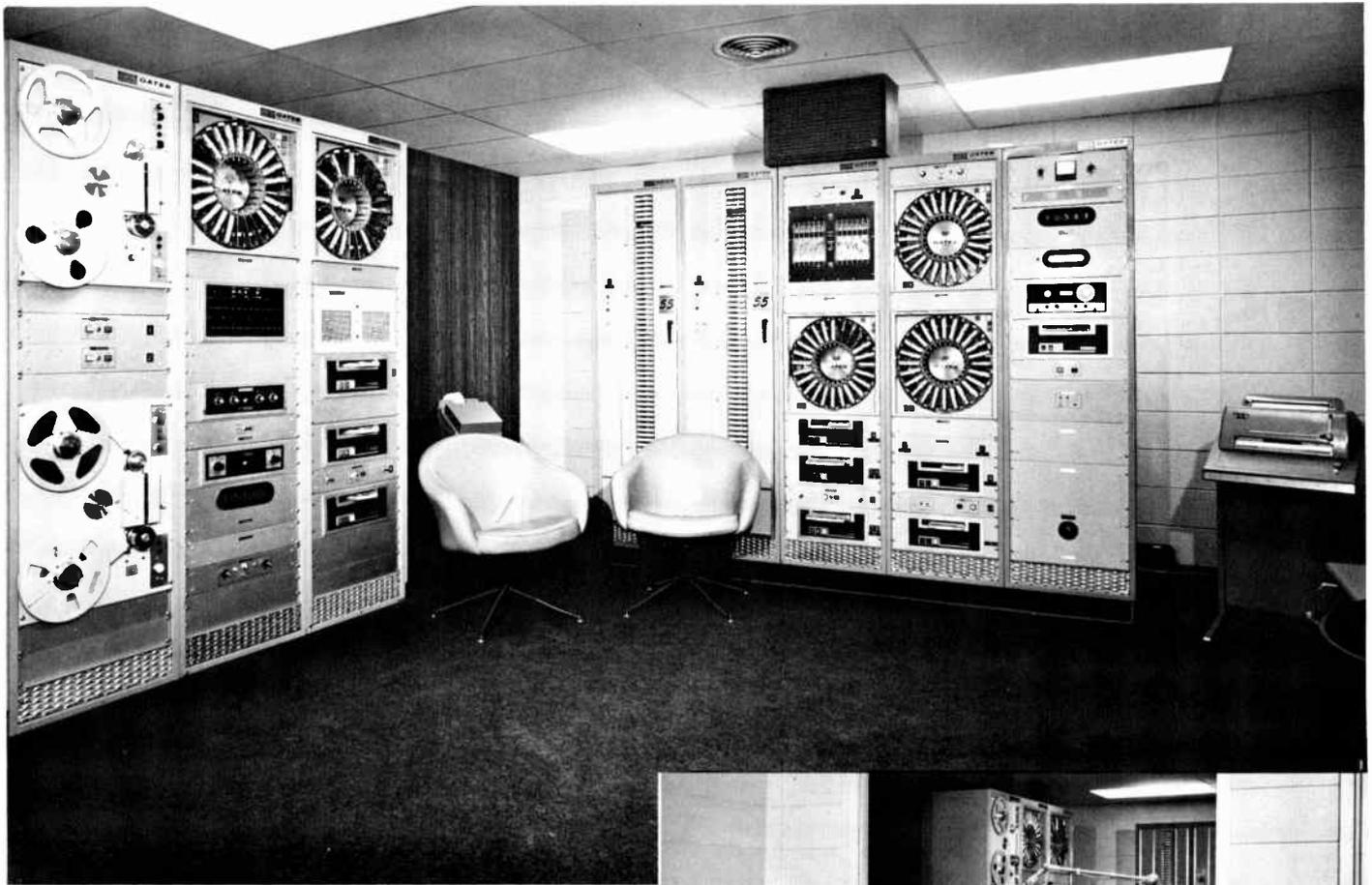
To offset rising costs of radio station operation . . . to improve program quality and content . . . and to provide additional statistical and control service . . . many broadcasters are employing Gates program automation systems on a full-time or part-time basis.

Modern program automation systems, properly employed, offer substantial advantages to most broadcast operations . . . large or small . . . AM or FM. These advantages include: more efficient utilization of available manpower, resulting in lower operating costs; relief of personnel from essentially mechanical tasks to allow more time for creative assignments and sales; and improved production, with better control over programming and the station image.

Gates program automation offers a realistic means of obtaining substantial operating economies, while building a superior and more saleable program product.

When considering automation, the broadcaster must exercise great care in selecting a system that fits his exact programming requirements. The philosophy behind Gates automation is to create a system to fit the format, rather than change a format to fit the system. At the same time, all Gates automation systems can be easily expanded as the station prospers . . . utilizing standard control components . . . at the lowest possible cost, consistent with quality.

To learn how Gates program automation can benefit your operation, contact your Gates District Manager, or a Gates Broadcast Automation Specialist.



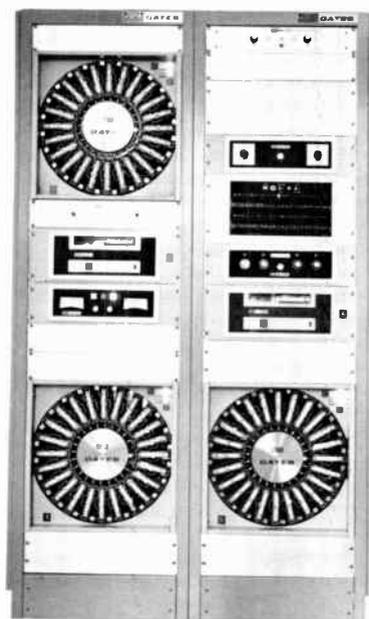
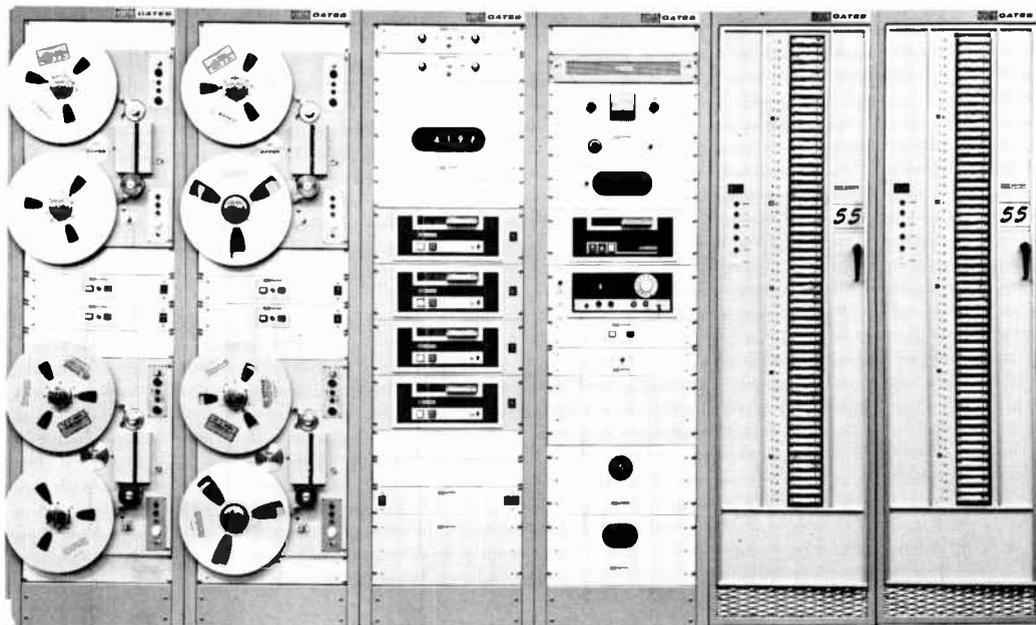
Views of Gates automation demonstration studios and recording facilities in Quincy, Illinois. Ideally suited for management and engineering evaluation of broadcast automation techniques.



# Program Automation Systems

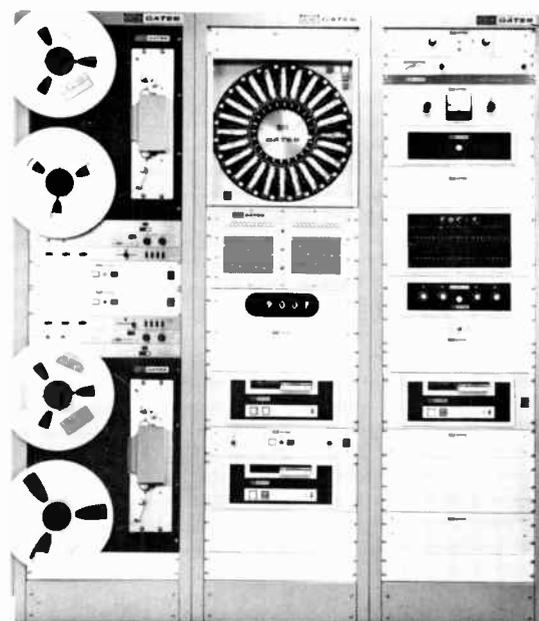
These photographs are representative of the many Gates automation systems installed by broadcasters throughout the world. A complete users list of stations with Gates program automation is available on request.

A new 50 kW AM station in the western U.S. has employed this Gates system since its first day on the air. A variety of programming formats can be handled through the combination of reel-to-reel transports, Criterion 80 cartridge decks, and the Criterion 55 multiple cartridge reproducers. The system also employs automatic digital program logging (not shown).



Small but highly flexible Gates automation system installed by FM stereo station on Florida Gulf Coast. This system can handle a "top 40" format and also perform "part-time" automation duties during portions of the broadcast day.

This economical system provides Gates GBR-15 tape transports for music programming and random access of tape cartridges for commercial announcements. Automatic time announcements and network joining featured in this unit are available in any Gates program automation system.



HARRIS  
INTERTYPE  
CORPORATION **GATES**

# SP-10 And SP-19 Programmers



The SP-10 and SP-19 program control systems provide fully automatic control of audio automation systems. The SP-10 unit will function with up to 10 audio sources, and as many as 19 may be controlled with the SP-19 Programmer.

SP-10 and SP-19 Programmers utilize a standard magnetic tape cartridge to store sequential format information in a virtually unlimited pattern. Either system can also provide numerous exact time functions by addition of the TS-3 Time Selector accessory.

Storage of operating instructions is obtained by dialing digits associated with various audio sources onto the memory cartridge. Approximately 1000 instructions can be stored on a 31-minute cartridge, for extreme flexibility in hour to hour program variations. The system programmer establishes format, not content, allowing a wide variety of programming without change in the programmer cartridge. The programmer is a device which automatically channels the "End of Message" pulse to the start circuit of the next selected source. The switching concept, exclusive with Gates, prevents such errors as the accidental simultaneous start of two or three sources on the air.

Digital information dialed onto the tape cartridge is stored as a cluster of control tones. As an example, dialing a "6" for the audio source designated number six causes a cluster of tones to be recorded on the tape. Upon playback during automated programming, this and other digits are read from the tape and provide the sequential control required. The programmer reads each digit individually and shows this digit as the next source to be broadcast in the front panel readout. A "cue" or reference tone may be placed on the cartridge

to identify the beginning of various program segments within the controlled format. Other control tones are available for special switching applications, such as the TS-3 Time Selector accessory which permits time entries at any 15-second portion of an hour.

A unique feature of the Gates SP-10 and SP-19 system programmers is their ability to "skip" programmed events stored on the tape cartridge when exact time programming is required. An example is automatic network joining. To assure sufficient programming time during the program segment preceding network joining, it is desirable to schedule an extra selection or two of instrumental music. If the selections are not required to fill out the programming time, they are "skipped" and not used in the programming sequence. With this feature it becomes possible to pad a program time segment with "fill" music and obtain exact time programming without precisely timing each program element.

With the TS-3 digital Time Selector, SP-10 and SP-19 systems may perform a variety of precise time-controlled functions such as: "dead-roll" or "back-time" of theme music, for network joining; changing of formats; or commercial load throughout the broadcast schedule, etc.

SP-10 and SP-19 Program Control Packages consist of a control unit and related memory tape cartridge deck, plus an associated 10 or 19 channel audio switcher.

Accessory items include: TS-3 Time Selector; OPC-10 and OPC-19 Audio Overlap Controls; External Audio Adapters (for sources without end-of-message cueing); Fade-In and Fade-Out Audio Panels.

## SPECIFICATIONS

**INPUTS:** SP-10 maximum of 10 sources—SP-19 maximum of 19 sources.  
**SOURCE SELECTION:** By digits dialed with a standard telephone dial into a tape cartridge memory.  
**SEQUENTIAL EVENTS:** Maximum of approximately 1000 before repetition.  
**TIME CORRECTIONS:** Provided by program control package accessories.  
**CONTROL VOLTAGES:** From self-contained power supply.  
**POWER SOURCE:** 105/125 volts, 1 amp, 60 Hz. (50 Hz available).  
**RELAYS:** Automatic Electric Class E telephone type—Automatic Electric stepping switch with gold-plated contacts.  
**HOUSING:** Rack mount with a slide-out chassis.  
**DIMENSIONS:** Control unit—7" high x 15" deep x 19" wide. Tape memory unit—7" high x 15" deep x 19" wide.

## ORDERING INFORMATION

SP-10 Program Control System, 10-source. Includes: control panel; memory tape unit; and AMS-10 master switcher ..... 900-0257  
SP-19 Program Control System. As above, except for up to 19 audio sources..... 900-0258  
OPC-10 Overlap Program Control accessory for SP-10. Provides audio overlap in automation system..... 900-0059  
OPC-19 Overlap Program Control. As above, used with SP-19 programmer ..... 900-0060  
TS-3 Time Selector. Provides exact time controlled functions in either SP-10 or SP-19 system. .... 900-0141

**NOTE:** Other associated control components may be needed to meet desired operating requirements.

# SC-48 Simplex Programmer

This easy-to-operate programmer is readily adapted to a sophisticated program schedule to provide variety in generating a "live" sound. The unit controls as many as nine sources in any combination of cartridge and reel-to-reel units. Thumb-wheel selectors are used to sequentially select the order of source appearance in the program. Up to 48 events can be sub-divided into two, four, or eight program segments with 24, 12 or 6 events in each segment.

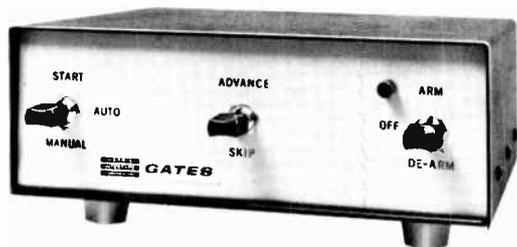
A time pulse generator associated with the SC-48 programmer is capable of providing up to four individual time corrections each hour. The actual correction time of each is determined by four rotary switches marked in five-minute increments. These switches are adjustable internally so that the exact time of correction may be offset from the true five-minute point. The rotary selector switch of each time correction point may be disabled if less than four corrections per hour are desired.

The program need not fade when it is time to make a time correction. Rather, after the selection playing is completed, the programmer will skip to the first event of the next program segment. In this way it is not necessary to exactly time program content and "fill" material can easily be added to each segment. Unused fill material is automatically skipped, assuring desired continuity.

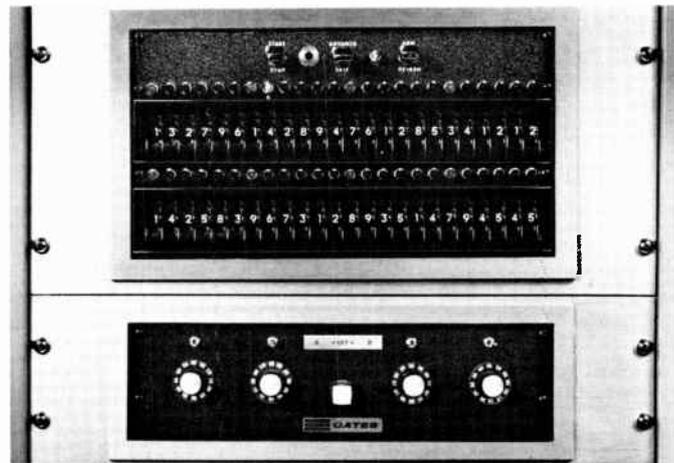
OPC-3A accessory provides controlled audio overlap capability in SC-48 automation systems.

With additional optional equipment it is possible to use the SC-48 programmer in an exact time correction system which will fade program material immediately upon correction by the time pulse generator and skip to the first event of the next program segment, which could be either network news or a spot or cartridge into preceding network news. A system of this type is fully capable of joining a network during unattended operation.

No changes in internal programmer wiring are needed to add or change audio sources controlled by the SC-48. A



RC-48A Remote Control Unit. Provides manual control of primary SC-48 Programmer functions: Start/Stop; Advance/Skip; and Arm/De-Arm.



socket is provided for each source. To add or change sources, it is only necessary to plug-in the tape unit's connecting cable at the back of the unit.

All relays used in the programmer are plug-in and completely sealed to provide protection from dust and dirt. Relays have gold contacts to assure dependable operation and years of trouble free service, even under demanding broadcast reliability standards.

## SPECIFICATIONS

**INPUTS:** Maximum of nine sources.

**SOURCE SELECTION:** Maximum of nine by thumbwheel switch.

**SEQUENTIAL EVENTS:** Forty-eight before repetition.

**TIME CORRECTIONS:** One, two, three or four may be inside each hour at any five-minute time during the hour.

**SENSING:** 25 Hz, left channel only (silence sensing on special order).

**FILTERING:** 25 Hz filter, left and right channel output (-8 dB at 50 Hz, -35 dB at 25 Hz).

**CONTROL VOLTAGES:** 24-volt DC self-contained power supply.

**POWER SOURCE:** 105-125 volts, 60 Hz. (50 Hz available)

**RELAYS:** Plug-in with dust covers. AE stepping switch with gold-plated contacts.

**AUDIO OUTPUT:** 600 ohms, balanced, -4 dBm.

**AUDITION CIRCUIT:** Headphone and rear panel output.

**TIMER PULSE:** One circuit each 2½ minutes. Two circuits vernier adjustable within 2½ minute increments.

**HOUSING:** Rack mount with slide-out chassis.

**SIZE:** (SC-48 w/25 Hz detector) 8¾" H x 19" W x 15" D.  
(Time pulse generator) 5¼" H x 19" W x 15" D.

## ORDERING INFORMATION

SC-48 Program Control System, 9-source. Includes: SC-48 control panel and TPG-2 time pulse generator.....900-0225

OPC-3 Overlap Program Control accessory for SC-48. Provides audio overlap in automation system.....900-0146

RC-48A Remote Control Unit .....900-0089



# Automation Systems Equipment

## CRITERION 855

With ample capacity for broadcast and storage of 55 NAB type A tape cartridges, and using the performance-proven Criterion 80 playback unit, the Criterion 855 provides increased flexibility for automation systems, while assuring excellent audio broadcast quality. It can be added to any Gates automation system.

Up to 55 cartridges are placed in the rack in the exact order they appear on the broadcast schedule. The deck moves from top to bottom and stops only at the slots which have a cartridge. It pulls the cartridge into position on the deck, and positively locks it against the microset head assembly, assuring unsurpassed audio quality.

## SPECIFICATIONS

**AUDIO OUTPUT:** 600 ohms +12 dBm maximum, (150 ohms optional) balanced.

**FREQUENCY RESPONSE:**  $\pm 2$  dB 70 to 12,000 Hz,  $\pm 4$  dB 50 to 15,000 Hz.

**DISTORTION:** Record to playback, 2% at 0 VU record level, 400 Hz.

**NOISE:** 55 dB below tape signal reference of 400 Hz with 3% THD.

**RECYCLE TIME:** 62 seconds from rejection of bottom cartridge until top cartridge is ready. Four seconds from shelf to shelf.

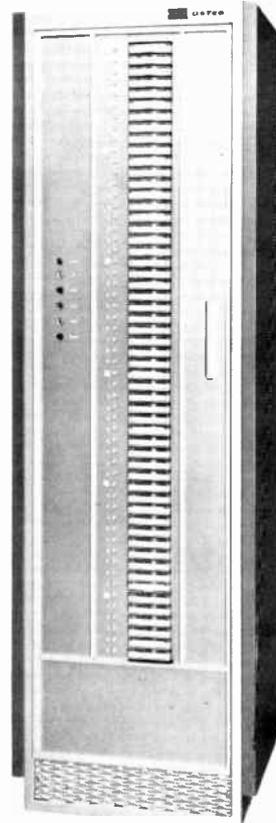
**SIZE:** 77 $\frac{1}{2}$ " high x 22" deep x 23 $\frac{3}{4}$ " wide. Net weight, 405 lbs.

## ORDERING INFORMATION

Criterion 855-M Multiple Cartridge Unit, monophonic ..... 900-0028

Criterion 855-S Multiple Cartridge Unit, stereophonic ..... 900-0029

**NOTE:** Above units sold less side panels for installation in automation systems. If panels desired, use 2 each, RAK-70 side panels.



## MULTIPLE CARTRIDGE REPRODUCER

Gates G-24 Carousel tape unit is a rotary drum mechanism for tape cartridges that can be operated by manual, automatic, and random access selectors. Each drum holds a maximum of 24 standard cartridges, and revolves to allow positioning of the cartridges against the stationary transport. The G-24 positions cartridges in sequence unless an optional random access unit is employed.

G-24 mono and stereophonic units are compatible with most existing automation systems. Modular solid-state electronics provide for the NAB standard controls of 1000 Hz, 150 Hz, and 8000 Hz. In addition, logic control of the start-stop functions may be used.

Exclusive Gates features adapted from the Criterion 80 cartridge machine for improved reliability include the microset head assembly and vapor-blasted large diameter capstan drive for increased torque and superior audio reproduction.

All units are Random Accessible with optional accessories. A manual remote control or a Random Access Programmer for automated use are available.

## SPECIFICATIONS

**AUDIO OUTPUT AND DISTORTION:** +4 VU max. into 600 ohms (less than 1% THD) from NAB reference level tape.

**FREQUENCY RESPONSE:** +1 dB to -2 dB 50-12,000 Hz at 7 $\frac{1}{2}$  ips.

**SIGNAL-TO-NOISE RATIO:** -56 dB @ 7 $\frac{1}{2}$  ips (mono), -52 dB @ 7 $\frac{1}{2}$  ips (stereo).

**SIZE:** 19" wide x 19" deep x 19 $\frac{1}{4}$ " high. Net weight, 95 lbs.

## ORDERING INFORMATION

G-24-M Multiple Cartridge Unit, monophonic ..... 900-0134-001

G-24-S Multiple Cartridge Unit, stereophonic ..... 900-0134-002

**NOTE:** Above units include Gates' exclusive features and Carousel Service Unit for extended logic and control in automation systems. Carousel Service Unit available separately (order 900-0206).



# Random Access Programmers

## MODEL RA-5

Gates Model RA-5 is a random access programmer designed to control as many as five Model G-24-M/S multiple cartridge reproducers.

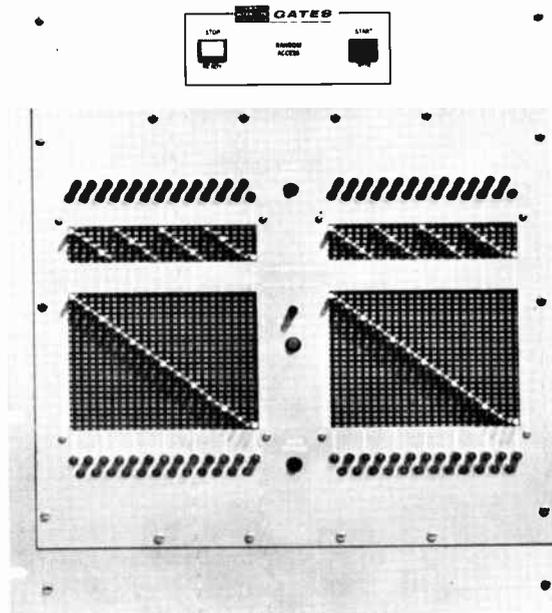
This unit will program up to fifty events (individual shelf positions) on the machines it is associated with before recycle of the sequence. The event storage capacity may be extended in multiples of fifty by using the appropriate number of optional RA-5X event extenders.

Unique audio mixing is provided within the switching section of the RA-5, and overlap between any two inputs is available at the operator's option. The audio overlap is determined by the position and duration of the 150 Hz switching tone recorded during production.

A sophisticated feature of the RA-5 not found on similar random access equipment is the solid state logic and memory circuitry provided to cause "search ahead." During operation, the RA-5 will cause each cartridge reproducer to search and access the required shelf until it recognizes that the next machine to be searched has not yet played.

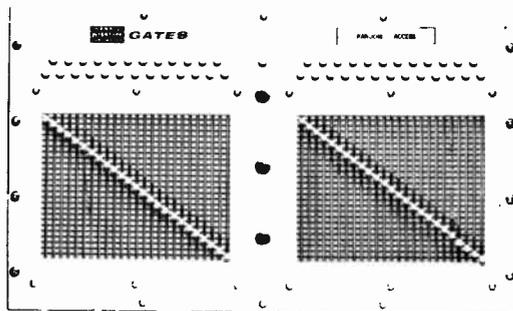
Two big advantages of the RA-5 are: simplicity in set-up over the method of having one programmer for each G-24; and the ease with which a system using less than five G-24 units may be expanded up to five (at the cost of the multiple cartridge units only).

Intended for rack mounting, the RA-5 measures 21" H x 19" W x 14" D (12 rack units). Power requirements are 115 volt AC, 60 Hz.



## ORDERING INFORMATION

RA-5 random access programmer for use with G-24-M/S multiple cartridge units. Inputs for up to 5 Model G-24 units.....900-0137  
RA-5X event extender for above unit. Any number of RA-5X units may be connected together to extend event storage of RA-5 in multiples of fifty. (Same size as RA-5, with plug-in connections).....900-0138



## MODEL RA-1

Gates RA-1 random access unit is intended to provide random selection for a single Gates multiple cartridge reproducer (G-24-M/S).

Assignment of cartridge sequence is determined by the positions of fifty vertical slider switches located on the front panel of the equipment. Thus, fifty selections can be made from any of the 24 shelves in the G-24 before repetition or re-programming. The fifty step sequence is repetitive in that

step one follows step fifty, and the sequence may be shortened to less than fifty events by setting any of the sliders to the lowest, or 25th position. This is the "S" or SKIP position. The usual procedure for setting up the RA-1 involves setting slider number 1 (left side) to the shelf number containing the first desired tape cartridge. Each succeeding slider, in sequence, is set as required to indicate the desired sequence of shelf assignment for the G-24. The INDEX button is pressed once to initiate the action required to access the first selected tape cartridge.

It is possible to alter the sequence midway so that a cartridge already selected will be rejected. This may be accomplished through the use of the ADVANCE and INDEX buttons, even though a tape cartridge is playing at the time.

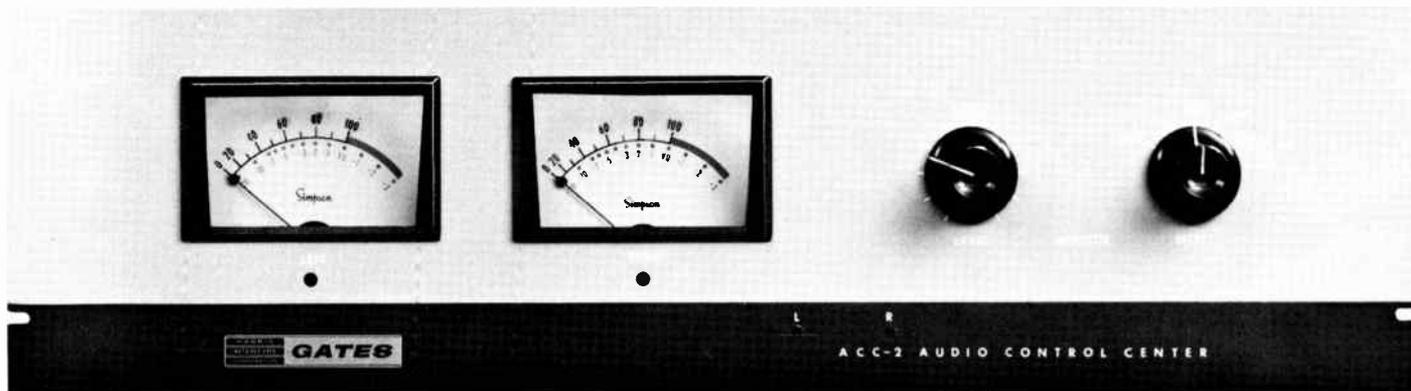
The RA-1 measures 10½" H x 19" W x 10" D, and is intended for standard rack mounting. The device is completely solid state, making use of SCR's for counting.

## ORDERING INFORMATION

RA-1 random access programmer for use with single G-24-M/S multiple cartridge reproducer.....900-0191



# Automation Systems Equipment



ACC-2  
STEREO  
AUDIO  
CONTROL  
CENTER

## AUDIO CONTROL CENTER

The ACC-1 and ACC-2 audio control centers provide a consolidated program output and monitoring unit for Gates' program automation systems. Solid-state modular amplifiers, as used in Gates' studio audio consoles, provide outstanding performance, with program amplifier output capability up to +26 dBm (+8 dBm nominal), and plug-in monitoring amplifiers at 10 watts (+40 dBm) per channel.

Both the monophonic ACC-1 and stereophonic ACC-2 control centers accept 25 Hz high-pass filter(s) for use in automation systems with reel-to-reel tape audio sources. The ACC-2 stereo audio control center also provides for the installation of an optional L + R sum channel output amplifier. Power supplies and all modular amplifiers plug into the rack-mount chassis.

The audio control center front panel facilities include VU metering, monitor gain control, and meter/monitor selector switch for visually and aurally checking: PGM, program output; CAL, processing equipment such as overlap, etc.; AUD, audition; and EXT, external audio source such as an air monitor.

In stereophonic ACC-2 units, a fifth switch position (NULL) provides an accurate check of channel phasing. Adjustment of program output levels is by screwdriver through access holes in the front panel.

The Gates ACC-1 monophonic audio control center is fully self-contained in a 5¼-inch rack-mounted unit. The ACC-2 stereophonic package includes a separate 3½-inch power supply panel which may be mounted adjacent to the ACC-2 control center or separated up to ten feet. External connections are to terminal strips in the rear of all units.

## SPECIFICATIONS

**PROGRAM INPUT:** 600 ohms, balanced. -40 to -7 VU for full output level, +8 dBm nominal.

**AUDITION/EXTERNAL INPUTS:** Bridging or matching as a function of input pad configuration. -25 to +14 VU.

**GAIN:** System input to program output, 21 dB nominal, 41 dB  $\pm$  2 dB maximum. Adjustment of fixed pads can accommodate input levels of -40 VU for systems with complex pre-processing losses.

**RESPONSE:** 30 to 15,000 Hz  $\pm$  1 dB.

**DISTORTION:** Program circuits 0.5% maximum 30 Hz to 15 kHz @ +18 dBm output; 1.0% maximum @ +26 dBm output. Monitor circuits 1.0% maximum 30 Hz to 15 kHz @ +40 dBm output (10 watts).

**NOISE:** -75 dB or better, 30 Hz to 15 kHz on all circuits with normal levels and control settings (-30 dBm input and +18 dBm output for program channels).

**POWER:** 117 volts, 50/60 Hz, 1 phase. 100 watts maximum for full stereophonic package.

**SIZE:** ACC-1 (complete) and ACC-2 audio section—front panel 5¼ inches high, 19 inches wide, 15½ inches deep behind front panel. ACC-2 power supply—3½ inches high, 19 inches wide, 15½ inches deep.

## ORDERING INFORMATION

ACC-1 Audio Control Center, monophonic. Includes program amplifier. Less monitor amplifier, 25 Hz filter (order separately) ..... 900-0273

ACC-2 Audio Control Center, stereophonic. Includes two program amplifiers and power supply. Monitor amplifiers and 25 Hz filters must be ordered separately..... 900-0274

ACC/MON Monitor Amplifier Module. Order 2 for stereo..... 900-0276

ACC-F 25 Hz High-Pass Filter. For systems with reel-to-reel music sources. Two required for stereo..... 484-0066

ACC/SCN Sum Channel Output Package. For ACC-2 units if L + R output desired. Includes 3rd program amplifier module ..... 900-0277



ACC-1 MONOPHONIC AUDIO CONTROL CENTER

# Automation Systems Equipment

## TIME ANNOUNCER

Gates' time announcer system provides pre-recorded time announcements automatically at the discretion of an operator or according to the pre-schedule of an automation system. Two standard Criterion 80 cartridge tape playback units are used (one for odd-minute announcements, one for even minutes), and are automatically synchronized by the TA-1 control unit. An external time pulse source is required by the TA-1. Systems with automatic program logging may utilize a digital clock, or order the TPM module listed below.



### ORDERING INFORMATION

TA-1 Control Panel (also requires 2 Criterion 80 cartridge playback units and time pulse source)..... 900-0056  
 TPM Time Pulse Module..... 900-0192

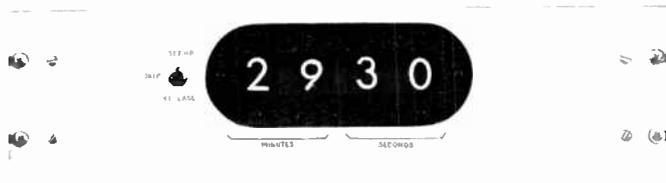
## TS-3 TIME SELECTOR

The Gates TS-3 Time Selector is an exact time control device that performs a switching function on a time-programmed basis in Gates' SP-10 or SP-19 automation systems. "Time assignment" instructions are stored in the SP-10/19 memory tape cartridge and may be executed at any 15-second point of any minute in the hour. Real time information is provided by the DC-10 digital clock, which is required in a system incorporating the TS-3 time selector.

Typical operation of the TS-3 would consist of exact time operation of the automation system for network joining, exact time station identifications, to control back-timed audio sources, etc. The time selector will operate only in conjunction with a DC-10 digital clock and the SP-10/19 programmers.

### ORDERING INFORMATION

TS-3 Time Selector..... 900-0141  
 DC-10 Digital Clock (60 Hz)..... 900-0037-001  
 DC-10 Digital Clock (50 Hz)..... 900-0037-002



## NETWORK JOINING

Network joining with an automation system is accomplished by system logic apparatus synchronized by a real-time clock base associated with the system. Depending on the broadcaster's preference, network joining usually incorporates fade-in or fade-out of program material.

The Gates MDF-M (mono) and MDF-S (stereo) Motor-Driven Faders provide an economical method of smoothly fading down programming to skip and join a network or other source on an exact time basis.

The Gates F1-M (mono) and F1-S (stereo) Fade-In Units are designed to start a theme or other program material at a pre-determined interval before an exact-time event, and

smoothly fade into that source so that the material will conclude precisely before starting the next event, typically a network program. The fade-in unit is used with a specific audio source, normally a Criterion 80 tape cartridge unit, for playing the pre-timed music selections.

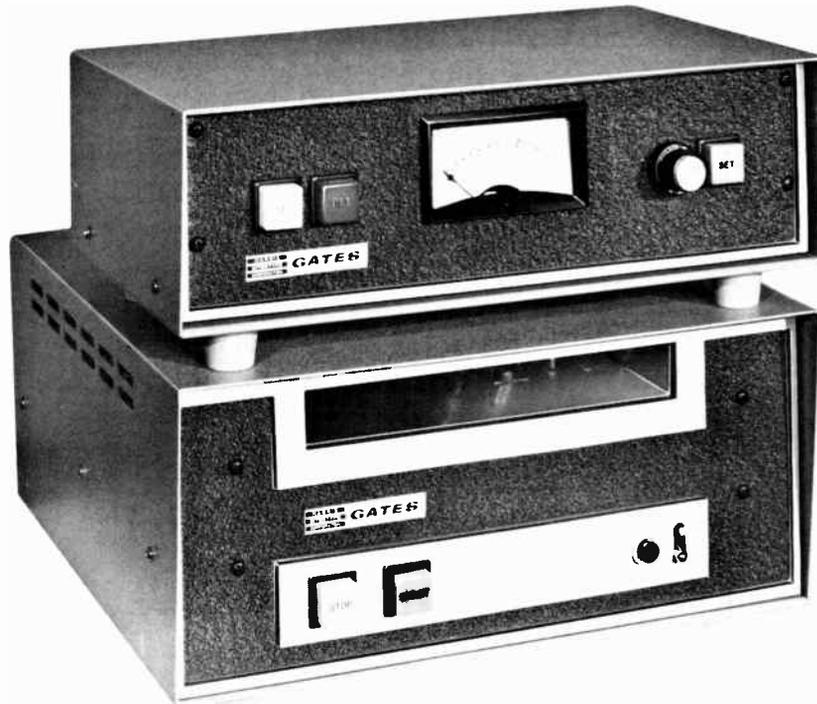
### ORDERING INFORMATION

MDF-M Motor-Driven Fader, monophonic..... 900-0044  
 MDF-S Motor-Driven Fader, stereophonic..... 900-0067  
 F1-M Fade-In Unit, monophonic. (Requires Criterion 80 audio source)..... 900-0255-001  
 F1-S Fade-In Unit, as above except stereo..... 900-0255-002



# Professional Tape Cartridge Systems

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## CRITERION 80

Now, from the originators of the tape cartridge system for broadcasting comes the ultimate in cartridge unit design . . . the Criterion 80 series, with built-in, performance-proven features. From sleek slide-out chassis and plug-in electronics to better timing, better wow and flutter, and dependable direct capstan drive for split-second timing accuracy, the Criterion 80 represents over twelve years of actual experience in the design, engineering and manufacturing of broadcast tape cartridge equipment.

Renowned for dependability and quality in broadcasting, Criterion units are in continuous service in the largest and most respected radio and television stations throughout the world.

The Criterion 80 has design improvements for still more efficient operation not found in its predecessors. Backed up by the rugged deck and tape drive assembly for which it is famous, the Criterion 80 in addition has the latest in silicon transistors, plug-in printed circuit boards, and independent gain controls for the cue amplifiers. The individual Criterion 80 circuits have been RFI proofed to make them impervious to strong RF fields. The printed circuit boards, however, are easily accessible for easy maintenance.

Other Criterion 80 advancements include output gain controls accessible from the front panel, automatic audio muting and transient suppression, and a +10 dBm output capability. All external cables have latching connectors for a more dependable installation.

**MODELS AND TYPES:** Criterion 80 models are available in playback only, or record/playback, in monophonic and stereophonic versions. The basic Criterion 80 unit is housed in a trim-line desk cabinet, and may be rack-mounted using the optional 19-inch rack adapter panels. The primary 1 kHz cue tone is standard. Second and third cue tone operation is optional on all models with plug-in cue sensing kits. All versions of Gates Criterion 80 series meet or exceed National Association of Broadcasters' performance standards. Monophonic units are fully wired for immediate conversion to stereo.

**PRECISION MECHANICAL CONSTRUCTION:** Major reasons for the excellence of the Criterion 80 units are: Outstanding engineering, and the quality of the tape deck motor mechanism, head assembly, and control solenoid. The entire assembly is built upon a heavy-duty, precision-machined aluminum casting, which assists in providing proper cartridge alignment on the exclusive Micro-Set head assembly, and is also the rugged inte-

# Professional Tape Cartridge Systems

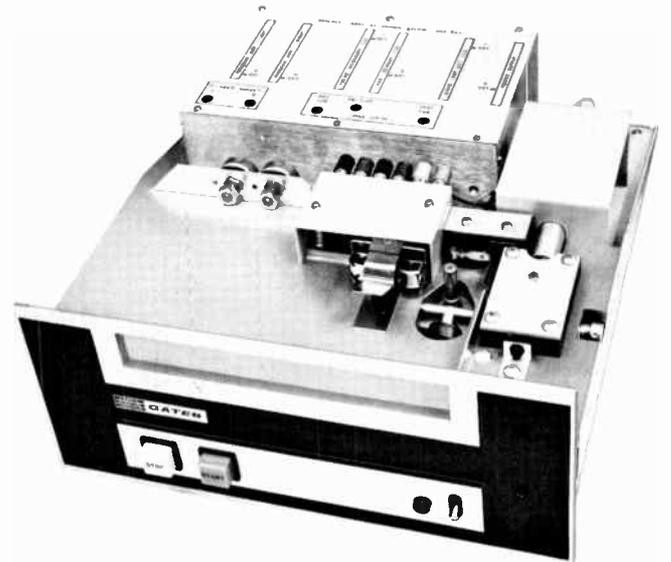
gral mounting base for the other tape transport components.

**POSITIVE DRIVE ACTION:** The heart of the Criterion 80 series playback unit is the heavy duty tape transport with its hysteresis synchronous positive speed direct capstan drive motor. The Criterion 80 tape transport offers speed accuracy to within 0.2%, comparable to the finest reel-to-reel machines. Sealed instrument-type ball bearings are used to keep transport wow and flutter to less than 0.2% rms. Three pounds of tape pulling force developed by the Criterion 80 transport virtually eliminates timing errors, regardless of cartridge size or tape length.

**ADVANCED ELECTRONICS:** Plug-in circuit boards offer the finest in advanced solid state engineering, adding years of life to electronic components and circuitry. Circuit boards are used throughout for easy component access, should maintenance be required. Electronics are all of plug-in design, including relays and circuit boards.

**QUIET STUDIO OPERATION:** Improved solenoid action and computer type relays reduce operating noise and contribute to the quiet mic-side operation of the unit. The fully proven automatic pinch-roller engagement makes actual studio operation easy, foolproof and noise free. Full motor shielding keeps signal-to-noise ratio low.

**RECORDING UNITS:** The Criterion 80 recording amplifier, like the playback unit, is housed in a trim-line desk console and may be rack mounted with the appropriate adapter panels. Latest state-of-the-art circuitry in Criterion 80 electronics provides a master-quality recorder for professional use.



## SPECIFICATIONS

### PLAYBACK UNIT

**POWER:** 105-125 volts, 60 Hz or 50 Hz. 70 watts maximum.

**FREQUENCY RESPONSE:**  $\pm 2$  dB 50 to 15,000 Hz.

**NOISE:** 45 dB (stereo), 48 dB (mono) below NAB standard reference. 52 dB (stereo), 55 dB (mono) below tape signal reference at 400 Hz, 3% THD.

**DISTORTION:** Record to playback, less than 2% at 6 dB above NAB standard reference.

**AUDIO OUTPUT:** 600 ohms, balanced, 0 dBm nominal, +10 dBm maximum.

**TAPE SPEED:** 7½ inches per second.

**TAPE DRIVE SYSTEM:** Direct capstan drive, sealed ball bearings.

**FLUTTER AND WOW:** 0.2% or less.

**TIMING ACCURACY:** 0.1% or better.

**TAPE START AND STOP TIME:** Less than 0.1 second.

**TAPE PULLING FORCE:** 3 pounds.

**DIMENSIONS AND WEIGHT:** Desk top cabinet, 6" high, 13½" wide, 14" deep. With rack adapter, 7" high, 19" wide. Net weight, 30 lbs.

### RECORDING AMPLIFIER

**POWER SOURCE:** From playback unit.

**AUDIO INPUT:** 600 ohms balanced line, input levels from -20 to +10 dBm, matching; +10 to +40 dBm bridging (20 K).

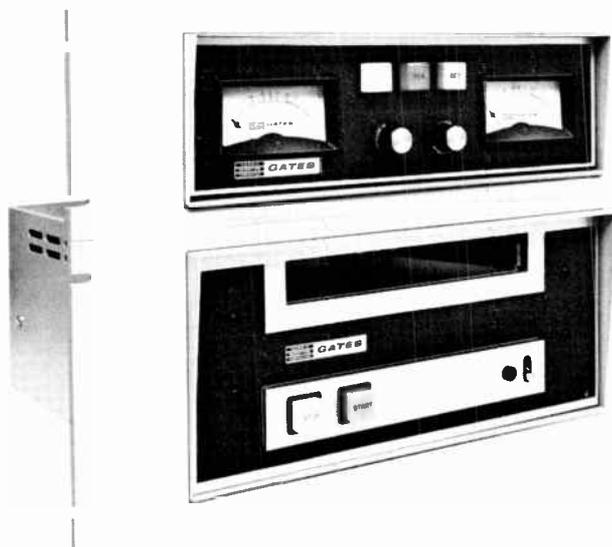
**REMOTE CONTROL:** All functions and lamp indications.

**BIAS OSCILLATOR:** Push-pull, 80 kHz.

**DIMENSIONS AND WEIGHT:** Desk top cabinet, 4" high, 13¼" wide, 12½" deep. With rack adapter, 5¼" high, 19" wide. Net Weight, 12 lbs.

## ORDERING INFORMATION

Criterion 80 Playback, mono, 1-tone, desk mount.....	994-6701
As above, except stereo.....	994-6702
Criterion 80 Record/Playback, mono, 1-tone, desk mount.....	994-6729
As above, except stereo.....	994-6731
QS-150, 150 Hz cue sensor. Plugs into playback for 2-tone cueing.....	900-0154
QS-B, B kHz cue sensor. Plugs into playback for 3rd tone cueing.....	900-0155
TO-23, 150 and 8000 Hz cue oscillator assembly, plugs into record amplifier for conversion to either 2 or 3 tone.....	900-0165
RA-P Rack Adapter Kit, playback. For 19" rack mounting.....	994-6790
RA-A Rack Adapter Kit, record amplifier. For 19" rack mounting.....	994-6791



# Professional Tape Cartridge Systems



## CRITERION COMPACT PLAYBACK UNIT

The Criterion Compact is the newest, advance-design version of Gates' famous Criterion tape cartridge system. Designed for convenient installation in crowded studios, and to conserve valuable rack space in automation systems, the Criterion Compact retains those features which have made Criterion the industry standard for cartridge machine excellence: rugged deck; massive direct drive capstan motor; and Micro-Set precision head assembly. The Criterion Compact playback also incorporates many new performance features for the broadcaster: the pressure roller solenoid is air-damped for whisper-quiet operation; single card electronics; illuminated pushbutton switches glow brightly to verify secondary and tertiary control tones on multi-cue units. Also, high-speed cueing is available for the Criterion Compact, as an option.

**MODELS AND TYPES:** The Criterion Compact playback is available for monophonic or stereophonic reproduction. Single or dual-channel playback amplifier cards plug into a common PC receptacle. Similarly, all three NAB standard cue tones are detected on a single PC sensor card. Thus, every Criterion Compact model has only two plug-in electronics assemblies.



The Criterion Compact is designed for desk or rack mounting at the user's option. Two Compact series playbacks can be mounted side-by-side in a standard 19-inch equipment rack in less space than normally required for a single full size Criterion. The Compact is only 5¼" high for desk or rack mounting, and slides out of its housing for maintenance.

**MULTI-CUEING FEATURES:** Primary, secondary, and tertiary control tones are sensed on a single PC card. All Criterion Compact units are equipped for 3-tone cueing—simply plug in the appropriate relay for external control.

**HIGH-SPEED CUEING.** An optional feature for the Criterion Compact playback is a high-speed drive for rapidly cueing cartridges to the 1 kHz primary cue tone after sensing the 150 Hz end-of-message signal. This can also be accomplished by manual override from a front panel pushbutton.

**SUPERB ELECTRONICS:** Improved silicon transistor circuitry is the basis for Criterion Compact's excellence in quality and reliability. Audio output capability is +18 dBm to overcome losses in complex studio or system installations. Audio distortion is virtually unmeasurable, limited only by the recorded tape being played.

## SPECIFICATIONS

**POWER:** 102-125 volts, 60 Hz (50 Hz on special order). 70 watts maximum.  
**FREQUENCY RESPONSE:** ±2 dB 50 to 15,000 Hz.  
**NOISE:** 45 dB (stereo), 48 dB (mono) below NAB standard reference. 52 dB (stereo), 55 dB (mono) below tape signal reference of 400 Hz, 3% THD.  
**DISTORTION:** Less than 1% at NAB standard reference level.  
**AUDIO OUTPUT:** 600 ohms, balanced, 0 dBm nominal, +18 dBm maximum.  
**TAPE SPEED:** 7½ inches per second. Optional 30 ips fast cue accessory available.  
**TAPE DRIVE SYSTEM:** Direct capstan drive, sealed ball bearings.  
**FLUTTER AND WOW:** 0.2% or less.  
**TIMING ACCURACY:** 0.1% or better.  
**TAPE START AND STOP TIME:** Less than 0.1 second.  
**TAPE PULLING FORCE:** 3 pounds.  
**DIMENSIONS AND WEIGHT:** Desk Mount: 5⅞ inches high, 8⅞ inches wide, 12½ inches deep. Net weight 20 pounds. Rack mount: 5¼ inches high, 19 inches wide (with rack mounting angles) for two Criterion Compact desk mount housings bolted side-by-side.

## ORDERING INFORMATION

Criterion Compact Playback, monaural, desk mount.....994-6794  
Criterion Compact Playback, stereo, desk mount.....994-6815  
Rack Mounting Kit, for mounting two Criterion Compact playbacks in a single 19" rack.....994-6812  
Quick-Cue Kit for conversion of Criterion Compact to high-speed cueing.....994-6816  
2nd and 3rd Cue Tone Relay. Add one for each tone desired...574-0162

# Tape Cartridge System Accessories



## REMOTE CONTROL/TIMER

Most control functions of the Criterion 80 record/playback unit can be remotely controlled with this attractive and convenient unit. A built-in timer registers the elapsed time of recording, simplifying production of multi-cut tapes. Starting the machine automatically activates the timer elapsed-seconds register. Stop, Start, Record Set, and all cue-tone functions of the Criterion 80 recorder are provided. Illuminated pushbuttons. Desk top unit measures 7¼" W. x 8" H. x 4½" D.

RC-T-8 Remote Control with elapsed time indicator ..... 900-0266



## RECORD/PLAYBACK REMOTE CONTROL

All control functions of the Criterion 80 record/playback unit are remotely controlled from this desk-top unit. Stop/Start switches, also Record Set, Secondary Cue, and Auxiliary Cue functions. When used with Criterion 80 recorder in playback mode, pushbuttons illuminate as cue tones are detected to facilitate checking encoded cartridges. Size: 5¾ inches wide, 5½ inches high, 2¾ inches deep.

RC-RA-8 Remote Control ..... 900-0267

## PLAYBACK REMOTE CONTROL

For remotely operating up to four Criterion 80 or four Criterion Compact playback units. Operates start circuit only. Includes ready lights and start switches (illuminated). Size: 5¾" W. x 5½" H. x 2¾" D.

RC-P4-B Playback Control for Criterion 80 ..... 900-0268

RC-P4-C Playback Control for Criterion Compact ..... 994-6817



## AUDIO SWITCHER PANEL

Up to four Criterion 80 units can be switched into one console input through this panel. Use two panels for stereo. Not for Criterion Compact.

AMS-4A Automatic Master Switcher ..... 900-0024



# Tape Cartridges And Accessories



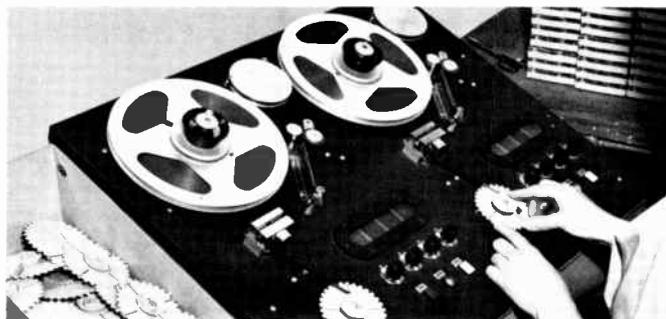
Gates tape cartridges are designed and manufactured to provide you with the finest over-all cartridge performance available today. Each careful production step assures this same high quality performance on the first and one-thousandth use of the cartridge. These tape cartridges meet and exceed all industry standards, and are fully compatible with all NAB standard tape machines.

In the manufacturing process, only the finest quality lubricated tape is used. It is wound on a precision automatic tape winding machine, and carefully spliced with magnifying glass attention. Special polyurethane pressure pads are installed in each cartridge to reduce wow and flutter to a minimum, while providing optimum tape-to-head contact.

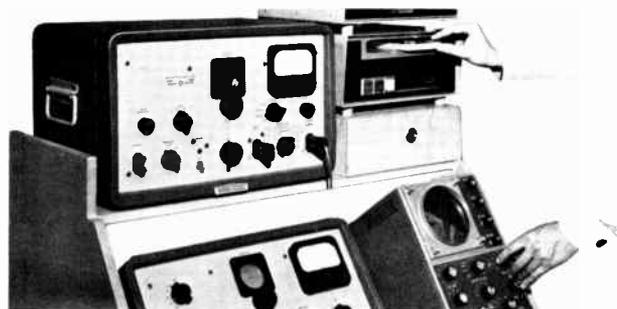
The final production steps include a careful checkout on a tape deck attached to a precision wow and flutter meter, and an additional test involving recording and playback to assure audio excellence. Only after these tests have been completed is the Gates "Label of Quality" added to each cartridge.

## ORDERING INFORMATION

A-300, 40 second cartridge	900-0077
A-300, 70 second cartridge	900-0078
A-300, 100 second cartridge	900-0079
A-300, 2½ minute cartridge	900-0080
A-300, 3½ minute cartridge	900-0081
A-300, 5½ minute cartridge	900-0082
A-300, 10½ minute cartridge	900-0083
B-600, 16 minute cartridge	900-0084
C-1200, 31 minute cartridge	900-0085
A-300 Empty cartridge	732-0220
B-600, Empty cartridge	732-0221
C-1200, Empty cartridge	732-0222
Cartridge Pressure Pads—(50 replacement foam plastic pads)	994-6430
Cartridge labels, 1000 (yellow, red, green, and white)	900-0065
FAL-1A Test Cartridge. Full track, for mono or stereo systems. Includes tones for azimuth alignment, frequency response, and standard level reference	900-0090



Tape is wound onto cartridge turntables with a precision tape winding machine to assure exact tape length and playing time.



Each cartridge is tested for recovery level of recorded tone to assure stable levels from cartridge to cartridge.



## TD-1 TAPE ERASER

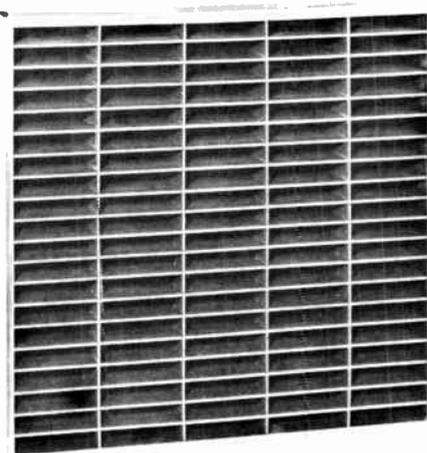
Professional model bulk magnetic tape eraser. Recommended for all sizes of tape cartridges, and reels up to 10½ inches. Lowers residual noise 3 to 6 dB below comparable hand-held units. Pushbutton operation. 117 volts, 50/60 Hz. Weight is 9 pounds. Manufactured by Audiolab.

## ORDERING INFORMATION

TD-1 Tape Eraser	732-0223
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# Tape Cartridge Storage Units



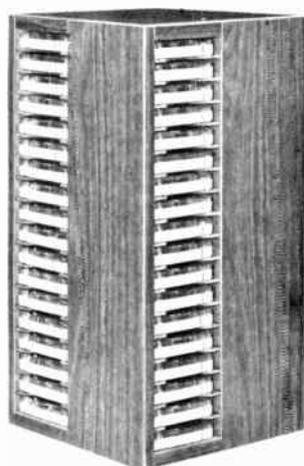
RM-100

M-5986 Storage Rack. Conveniently stores forty "Type A" Series 300 cartridges in only 10½" of standard rack space.



M-5986

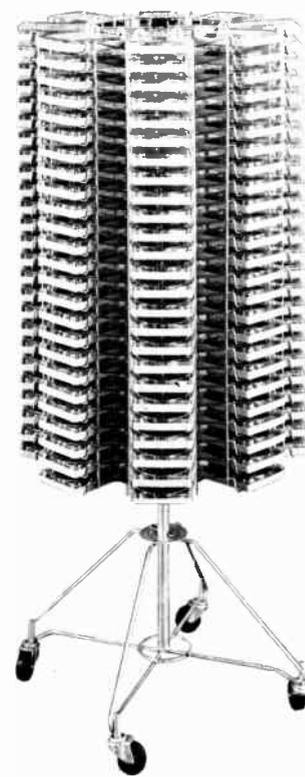
RM-100 Wall Mount Cartridge Rack provides for storage of 100 Series 300 cartridges in minimum space. The unit can be wall or table top mounted. Walnut formica trim. Dimensions 2' H x 2' W x 4¾" D.



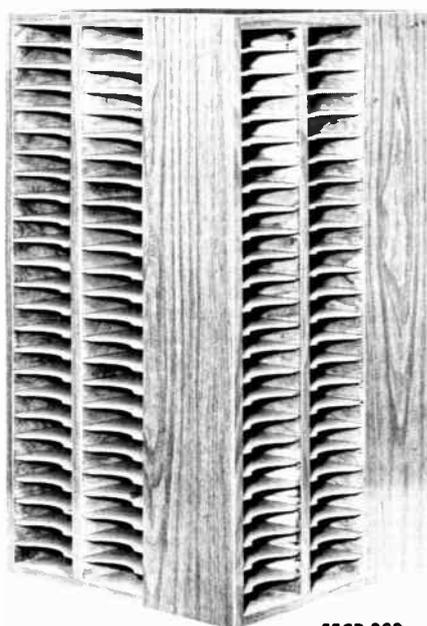
SECR-72

RS-200 Lazy Susan Revolving Cartridge Storage Rack—eight removable rack sections each store 25 "Type A" Series 300 cartridges, for a total of 200 for the unit. The RS-25 racks may be removed for use in other studios and are available separately.

SECR-72 Storage Cabinet. Attractive walnut formica trim blends with any decor. Storage space for 72 Series 300 cartridges. Cabinet rotates on ball bearings. Dimensions: 22" high x 11" wide x 11" deep.



RS-200



SECR-200

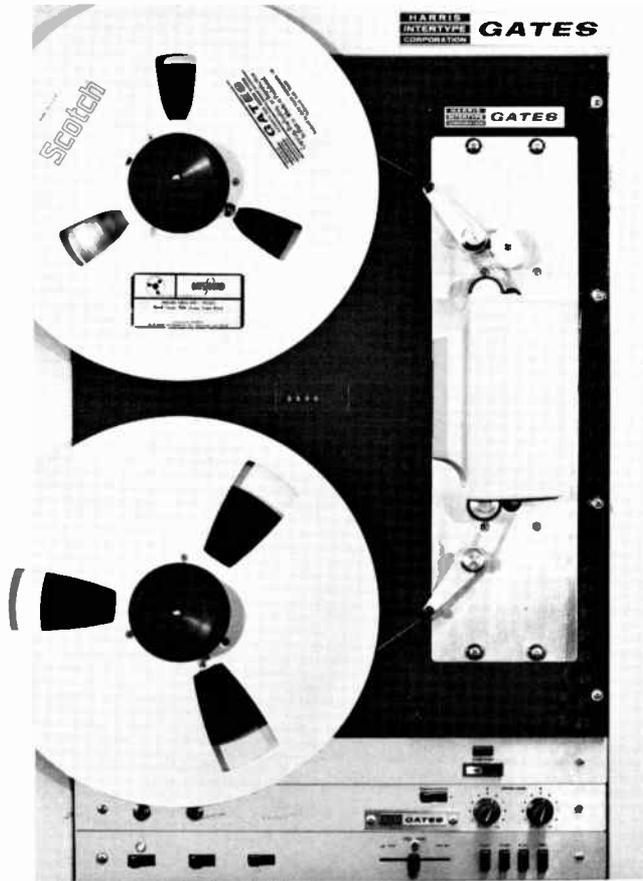
SECR-200 Storage Cabinet. Walnut formica trim for attractive over-all appearance. Capable of storing 200 Series 300 cartridges. Rotates on ball bearings. Dimensions: 29½" high x 15¾" wide x 15¾" deep.

## ORDERING INFORMATION

M-5986 Storage Rack for 40 Series 300 cartridges.....	994-5986
RM-100 Storage Rack for 100 Series 300 cartridges.....	730-0834
RS-200 Storage Rack for 200 Series 300 cartridges.....	730-0835
RS-25 Storage Rack for 25 Series 300 cartridges (not shown).....	730-0836
SECR-72 Storage Cabinet for 72 Series 300 cartridges.....	900-0147
SECR-200 Storage Cabinet for 200 Series 300 cartridges.....	900-0148



# Professional Tape Recorders



## GATES GBR-15 TAPE TRANSPORTS

The new GBR-15 recorders/reproducers have been designed specifically for the broadcaster. GBR-15 units are special configurations of the Ampex ABR Series for exclusive use in Gates' broadcast automation systems.

The GBR-15 transport accommodates reel sizes up to 15 inches in diameter and is available in either uni-directional or bi-directional versions for automation applications.

In the bi-directional configuration, Gates' GBR units are totally symmetrical machines. Separate capstan drive motors are used, one for each direction, for better tape handling performance. Tape is always pulled across the heads, never pushed, thus improving head-to-tape contact. Automatic reversing with the use of alternate tracks in each direction eliminates turning reels over and reueing.

A new direct-drive system, controlled by an electronic servo uses specially designed DC motors. An electronic tachometer, referenced to a bridge oscillator, provides tape speed accuracy unaffected by voltage, frequency or phase fluctuations from the input power line. This

system eliminates several electrical and mechanical components that can affect tape speed stability and increase flutter. All transports may operate at any two adjacent speeds, and Gates GBR units are provided with record and/or reproduce electronics for 3¾—7½ ips operation. Bi-directional machines also have dual, independent heads for optimum performance in either mode.

All units have continuously variable fast speed and direction control and are provided with Gates' exclusive motion sensing for protection of valuable taped program material during rewind operations.

Gates GBR-15 transports and electronics are all of modular design. Transport control modules, record and reproduce electronics are all on compact 1¾-inch rack units as illustrated.

## SPECIFICATIONS

**TAPE SPEEDS:** 3¾ and 7½ ips, standard. Other speeds available on special order. Bridge oscillator/servo drive accuracy  $\pm 0.05\%$ , 0° to 65° C.

**SIGNAL-TO-NOISE RATIO:** 7½ ips full track 66 dB, 2 track 63 dB; 3¾ ips full track 63 dB, 2 track 58 dB.

**FREQUENCY RESPONSE:** 7½ ips  $\pm 2$  dB, 40 to 15,000 Hz; 3¾ ips  $\pm 2$  dB, 40 to 10,000 Hz.

**FLUTTER AND WOW:** 7½ ips below 0.15%; 3¾ ips below 0.18%.

**PLAYBACK OUTPUT:** +4 dBm, balanced. +24 dBm clipping level. Amplifier total harmonic distortion at +20 dBm, less than 0.1%.

**RECORD INPUT:** 100,000 ohms unbalanced. Accepts line level from -17 dBm for recommended operating level.

**START/STOP TIME:** Start, 0.1 second; stop, tape travel 2 inches @ 7½ ips.

**TAPE SPEED ACCURACY:** Within  $\pm 0.08\%$  from beginning to end of any size reel or tape load, unaffected by line voltage or frequency fluctuations.

**EQUALIZATION:** NAB standard, CCIR on special order.

**POWER REQUIREMENTS:** 105 to 125 VAC, 50/60 Hz. 2.2 amps @ 115 VAC.

**DIMENSIONS:** GBR-15 transport: 19 inches wide, 24½ inches high. Weight, 50 pounds. Electronics and control units: 19 inches wide, 1¾ inches high (each unit). Weights range from 4 to 6 pounds.

**REEL SIZE:** GBR-15 units: up to 15-inch reel. ABR/GBR-10 units available for reel sizes up to 10½ inches.

Complete specifications available on request.

## ORDERING INFORMATION

### REPRODUCERS

GBR-1521. ½-track mono or 2-track stereo reproducer only.

Uni-directional, with motion sense. 15-inch reel size.

3¾ - 7½ ips ..... 730-1398

GBR-1512. ½-track mono reproducer only. Bi-directional,

with motion sense. 15-inch reel size. 3¾ - 7½ ips

..... 730-1399

GBR-1542. ¼-track stereo reproducer only. Bi-directional,

with motion sense. 15-inch reel size. 3¾ - 7½ ips

..... 730-1400

### RECORD/REPRODUCERS

GBR-1511 R/P. ½-track mono record/reproducer. Uni-

directional, with motion sense. 15-inch reel size.

3¾ - 7½ ips ..... 730-1401

GBR-1521 R/P. 2-track stereo record/reproducer. Uni-

directional, with motion sense. 15-inch reel size.

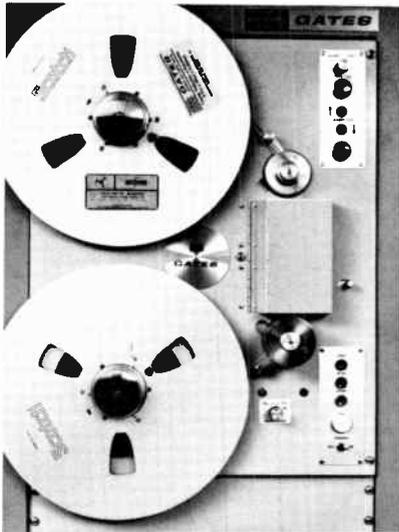
3¾ - 7½ ips ..... 730-1402

GBR-1541 R/P. ¼-track stereo record/reproducer. Uni-

directional, with motion sense. 15-inch reel size.

3¾ - 7½ ips ..... 730-1403

# Professional Tape Recorders



MODEL 270

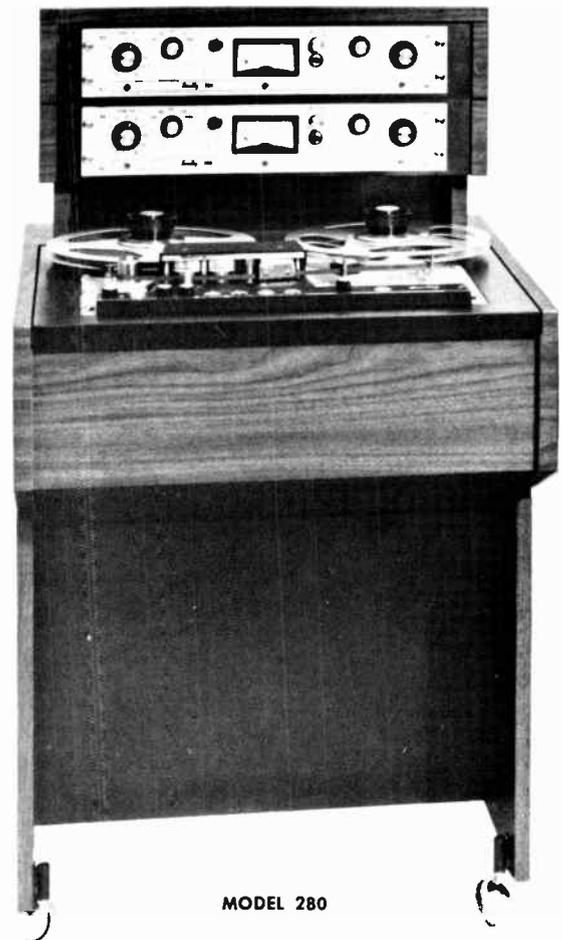
## SCULLY PRECISION TAPE EQUIPMENT

The portable Scully 270 Reproducer is intended for broadcasters, background music operators or any application where long life, reliability and exacting performance specifications in tape handling equipment are essential. The companion model 280 complete record/reproduce system has the same fine features plus quality all-transistor recording amplifier.

### SPECIFICATIONS

Model 270

**TAPE SPEEDS:** 3¼ ips-7½ ips or 7½-15 ips.  
**TAPE SIZE:** ¼" or ½".  
**HEAD CONFIGURATION:** Monophonic half or full track; stereo 2, 3, or 4 channel.  
**REEL SIZE:** Up to 14".  
**REEL HUBS:** NAB, CCIR.  
**STARTING TIME:** 1/10th second.  
**STOPPING TIME:** 1/5th second.  
**FAST WIND TIME:** 4800 foot reel—105 seconds.  
**PLAYING TIME:** 14" reel, 4800 feet 1½ mil tape @ 3¼ ips—8 hrs. 7½ ips—4 hrs; 14" reel, 9600 feet ½ mil tape @ 3¼ ips—16 hours; @ 7½ ips—8 hours.  
**FREQUENCY RESPONSE:** ±2 dB 50-7500 Hz @ 3¼ ips. ±2 dB 50-15,000 Hz @ 7½ ips. ±1½ dB 50-15,000 Hz @ 15 ips.  
**FLUTTER AND WOW:** 0.2% RMS @ 3¼ ips. 0.1% RMS @ 7½ ips. .08% RMS @ 15 ips.  
**SIGNAL TO NOISE RATIO (FULL TRACK):** -60 dB @ 7½ and 15 ips.  
**TIMING ACCURACY:** Better than 99.8% (30 minute reel).  
**AMPLIFIER:** Solid State, plug-in.  
**AMPLIFIER EQUALIZATION:** Front panel switch.  
**AMPLIFIER OUTPUT:** +18 dBm 600 ohms balanced line.  
**AMPLIFIER DISTORTION:** Less than 0.5% total HD at +18 dBm.  
**OPERATING CONTROLS:** Play, fast, Direction Change, Stop, Speed Selector, Equalization.  
**REMOTE FEATURES:** All controls except motor speed change.  
**REVERSING:** Foil using low current transistor switching, with mechanical memory.  
**MOTORS:** Two torque and one hysteresis synchronous speed reversible capstan motor.  
**POWER REQUIREMENTS:** 117 V, 50/60 Hz, 275 watts.



MODEL 280

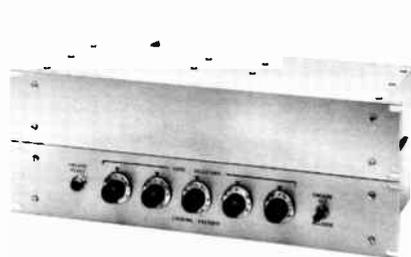
**CONTROL SYSTEM:** All relays and solenoids 24 volts DC; plug-in relays.  
**CHASSIS FRAME:** ¾" cast aluminum 2" depth.  
**MAIN PANEL:** Precision aluminum plate.  
**FACE PLATE:** Easily removable, permitting continuous operation.  
**BREAKING SYSTEM:** Disc Type.  
**TAPE TENSION:** Continuous adjustable electrical controls system.  
**WEIGHT:** 79 lbs.  
**SHIPPING WEIGHT:** 90 lbs.  
**SIZE:** 19" x 24½" x 8¾".

## ORDERING INFORMATION

Model 270-1 Rack mount reproducer, ½ track monophonic, 14" reel capacity, 7.5/15 ips.....730-0927  
 Model 270-2 As above, except for stereophonic reproduction.....730-0928  
 Model 280-1 Rack mount record/reproduce. ½ track monophonic, 10½ reel capacity, 7½-15 ips.....730-0923  
 Model 280-2 As above, except for stereophonic.....730-0924  
 Model 280-1 (SP-14) Rack mount model 280 monophonic recorder with 14" reel capacity.....730-0925  
 Model 280-2 (SP-14) As above, except for stereo.....730-0926

HARRIS  
 INTERTYPE  
 CORPORATION  
**GATES**

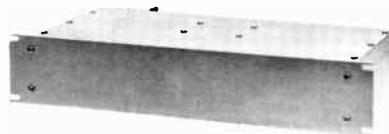
# Automation Systems Equipment



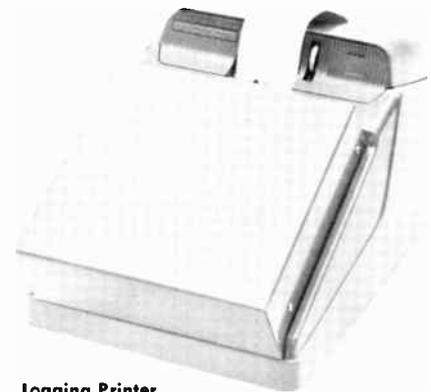
Logging Encoder.



Digital Clock



Logging Decoder.



Logging Printer.

## AUTOMATIC PROGRAM LOGGING

Gates system of automatic program logging provides an accurate, printed record of programming actually broadcast. This system has been the basis for FCC license renewal at many automated broadcast stations and meets FCC log verification requirements. A logging printer, similar to an adding machine, prints the time at which each source in the system is started, along with a five digit code for all entries which require identification. If identification is not required, the code is automatically replaced by five zeros, making all logging complete.

The program logging equipment consists of a logging encoder for recording a five digit logging code on the control track of any tape cartridge; a logging decoder for reading the five digit code during playback; a digital clock to furnish time of broadcast; and a logging printer to print the broadcast time and the logging code.

## SPECIFICATIONS

**SYSTEM COMPONENTS:** Logging encoder, logging decoder, digital clock and logging printer.

**RECORD PRINT-OUT:** Standard adding machine tape . . . may be set single, double or triple space.

**PRINT-OUT INFORMATION:** Time and five digit code.

**TIME PRINT-OUT ACCURACY:** Within 30 seconds of time shown on print-out tape.

**OPERATION:** Uses 8 kHz tone pulse clusters on cartridge control track to form digits.

**POWER SOURCE:** 105-125 volts, 2 amps, 60 Hz.

## ORDERING INFORMATION

APL/G Automatic Program Logging System (for use with programming systems) ..... 900-0316

CG-8 Special Code Generator (optional). Provides 8 different five digit logging codes to identify non-cartridge automation sources such as network, live studio, etc. .... 900-0040



## DC-10 DIGITAL CLOCK

The DC-10 digital clock is used as a centralized source of time information in Gates automated broadcast systems. It may also be used to control the operation of auxiliary apparatus within the program automation system, or external non-related equipment. Visual time information is displayed on the front of the unit, with rear chassis connections for operation of other equipment.

Use of the DC-10 digital clock to control all time related functions assures fully synchronized operation of the broadcast facility. 115 VAC power required. Dimensions: 7" high, x 19" wide x 11" deep.

DC-10 digital clock (60 Hz)..... 900-0037-001

DC-10 digital clock (50 Hz)..... 900-0037-002

# Automation Systems Equipment

## AUTOMATIC CLEAR-TEXT PROGRAM LOGGING

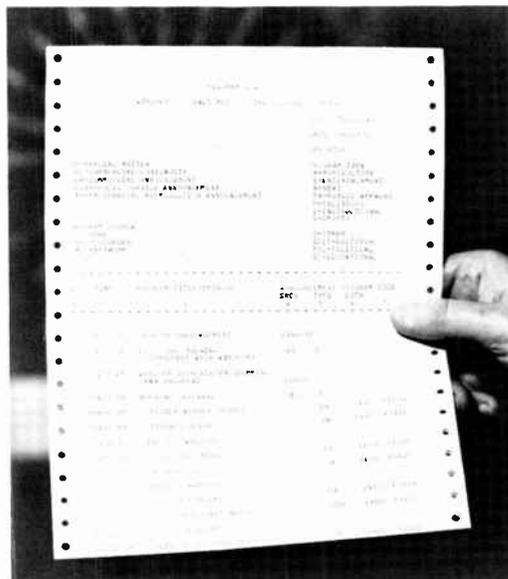
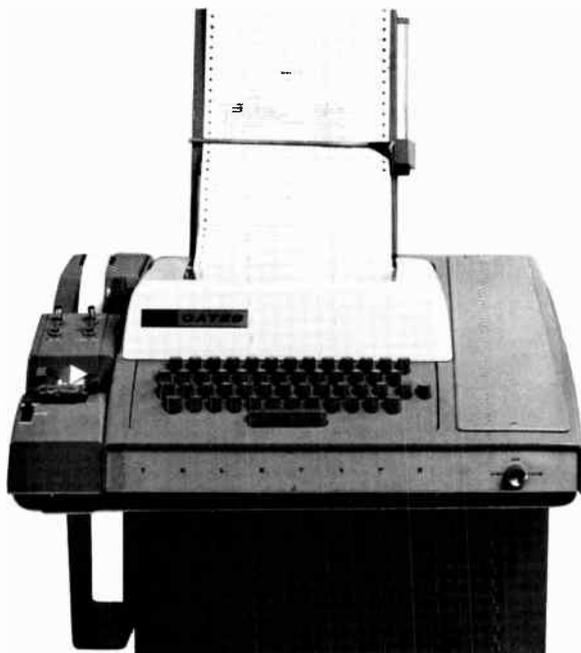
An accurate program log is an absolute necessity for any AM or FM station. Performed manually, this can be a difficult and time consuming task for station personnel . . . but it is greatly simplified for the automated station with Gates' Clear-Text Program Logging.

**INSTANT VERIFIED LOGGING:** In designing the alpha/numeric (ANL) system, Gates had two basic goals in mind:

1. To provide Clear-Text printed copy as the logging output from an automation system, with true verification of the program content on-the-air.
2. To provide a "computer-compatible" system which can be interfaced with standard data processing equipment at the station or remote locations.

Gates' Clear-Text Program Logging provides printed lines of data from the control track of a tape cartridge as the program material is broadcast. A considerable amount of information about the particular audio message can be reproduced on the log sheet in text form, including: identification code; broadcast time; program name and length; and commercial or public service announcement name and time. Data impulses are decoded directly from the material being broadcast and, unlike other "printed logs", prints what actually played—not what is hoped was played. This is verified program logging for modern management.

**THE LOGGING LANGUAGE:** In setting up the ANL Clear-Text Logging System, Gates selected the ASCII Code (American Standard Code for Information Interchange). This commonly-used EDP code makes the Gates Automation System compatible with most major data processing systems of computer terminals. The Gates logging concept may be employed with your present or future EDP system—computer, magnetic tape, disc, punched cards or tape.



**PREPARATION:** After producing the program content of the commercial, the tape cartridge is encoded with all the pertinent data to be retrieved at air time. This step employs a Criterion 80 cartridge unit and suitable ASCII data device of the customer's choice. This equipment is interfaced with the Criterion cartridge record amplifier for the purpose of encoding control tracks of broadcast tape cartridges.

**COMPLETE INFORMATION:** The product of the page printer in a system is capable of providing all of the information required by the FCC, since it is an accurate record of what was broadcast. In addition to commercial announcements and public service announcements, programs can be logged by providing a cartridge with an opening theme; time announcements can be logged, since length of the audio message is not a consideration. Time information is recovered from a digital clock each time decoding starts.

**OTHER SYSTEM USES:** The "computer compatibility" of Gates' Clear-Text logging approach frees much of the system for applications in other data acquisition areas of the broadcast operation . . . or vice-versa. Since encoding of commercial cartridges can be accomplished from a wide variety of EDP devices, the special equipment required within the program automation system itself is minimized. As compared to a standard broadcast automation system, additional components required for ANL/Clear-Text Program Logging are: ASCII encoder and decoder electronics; ASCII source modules for each logging source; and a page printer of the station's choice. A unit such as the 33ASR printer/keyboard with tape reader and punch can serve both as encoding terminal and/or decoding page printer with feed to Data-Phone, etc. At the end of the day, this tape is fed into a high-speed reader which is coupled by DataPhone to a leased computer center. Here the information for each account is stored, and released in the form of itemized bills each month.

ORDERING INFORMATION AVAILABLE ON REQUEST

HARRIS  
INTERTYPE  
CORPORATION **GATES**

## HOME OFFICE AND MAIN PLANT

QUINCY, ILLINOIS 62301  
123 Hampshire Street  
Phone: 222-8200, Area 217

## DISTRICT OFFICES

NEW YORK, NEW YORK 10016  
130 East 34th Street  
Phone: 889-0790, Area 212

WASHINGTON, D. C. 20005  
730 Federal Building  
1522 K Street, N. W.  
Phone: 223-5508, Area 202

LOS ANGELES, CALIFORNIA 90007  
1945 South Figueroa  
Phone: 747-7129, Area 213

## SERVICE CENTERS

NEW YORK, NEW YORK 10016  
130 East 34th Street  
Phone: 889-0790, Area 212

HOUSTON, TEXAS 77027  
4019 Richmond Avenue  
Phone: 623-6655, Area 713

## CANADIAN SALES GATES (CANADA)

Division of Harris-Intertype (Canada) Ltd.

MONTREAL OFFICE  
212 Brunswick Boulevard  
Pointe-Claire, Quebec, Canada  
Phone: 695-3751, Area 514

TORONTO OFFICE  
19 Lesmill Road  
Don Mills, Ontario, Canada  
Phone: 447-7234, Area 416

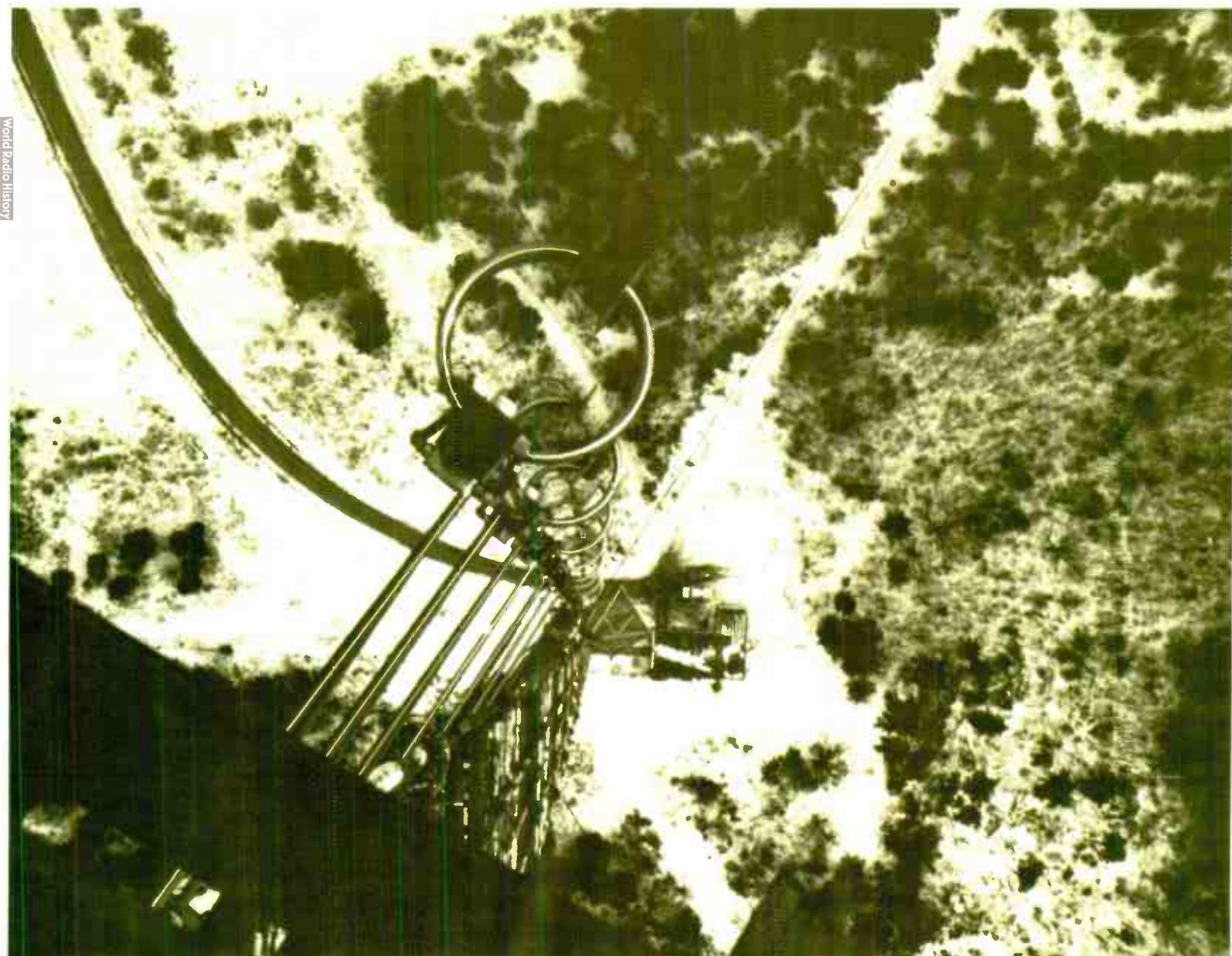
## INTERNATIONAL SALES OFFICE

NEW YORK, NEW YORK 10016  
130 East 34th Street  
Phone: 725-9800, Area 212



# GATES

## FM ANTENNAS AND ACCESSORIES



World Radio History

# GATES...the Leader in FM Antennas



**Gates' Directional Dual Cycloid antenna, installed at Station WCLV-FM, Cleveland, Ohio, is mounted atop the 640 foot Terminal Tower Building in downtown Cleveland. The WCLV-FM antenna consists of four Gates' directional circularly polarized elements. This antenna is available in arrays with up to eight bays.**

Gates Radio Company, the leading supplier of FM antennas, has installed more FM antenna systems than any other manufacturer.

Gates established a reputation as a supplier of advance design antennas with the introduction of the Cycloid, the first major change in the FM antenna field since World War II. Primarily developed to accommodate FM stereo, it featured binary tuning.

With the advent of both vertical and horizontal polarization, Gates became a leading distributor of the 300G vertical radiator which permitted broadcasters to add vertical polarization.

The Dual Cycloid series is the company's latest contribution to the FM antenna state-of-the-art. This series provides circular polarization from one element, resulting in the reduction of the "plumbing" required on FM towers.

Gates offers four circularly polarized antennas: the Dual Cycloid for high power stations; Dual Cycloid II for medium power stations; Dual Cycloid III for low power stations and the Directional Dual Cycloid antenna.

These antennas are noted for their mechanical ruggedness and transmission reliability. Constructed of a brass alloy, they are assembled with either phosphor bronze or stainless steel nuts and bolts, which, unlike aluminum, withstand the corrosion from salt-laden air and industrial gasses.

Dual Cycloid antennas are normally supplied with equal power radiation in both horizontal and vertical planes. Each antenna is factory checked to assure this 50-50 power split. Other power splits, permitting a station to have more radiated power in the horizontal plane than in the vertical plane, are available on special order.

Null fill and beam tilt are offered with the Dual Cycloid and Dual Cycloid II. Null fill is achieved by adjusting the power relationship between the upper and lower bays. Beam tilt is normally accomplished by varying the phase relationship between the upper and lower bays.

The entire series of Dual Cycloid antennas has been performance proven. The polarization of the elements was verified by a private antenna testing laboratory which measured an accurately scaled model of the antenna. Tests found the Gates' Dual Cycloid antenna polarization to be within the accepted limits of circular polarization.

The antennas have withstood the test of rugged environments such as mountain top installations where heavy ice and high wind conditions prevail. Protection against icing is provided by optional antenna heaters which are available in varying wattages and with manual or automatic antenna deicer controls or by radomes.

All Gates antennas exhibit low standing wave characteristics as each antenna is factory tuned on a tower structure.

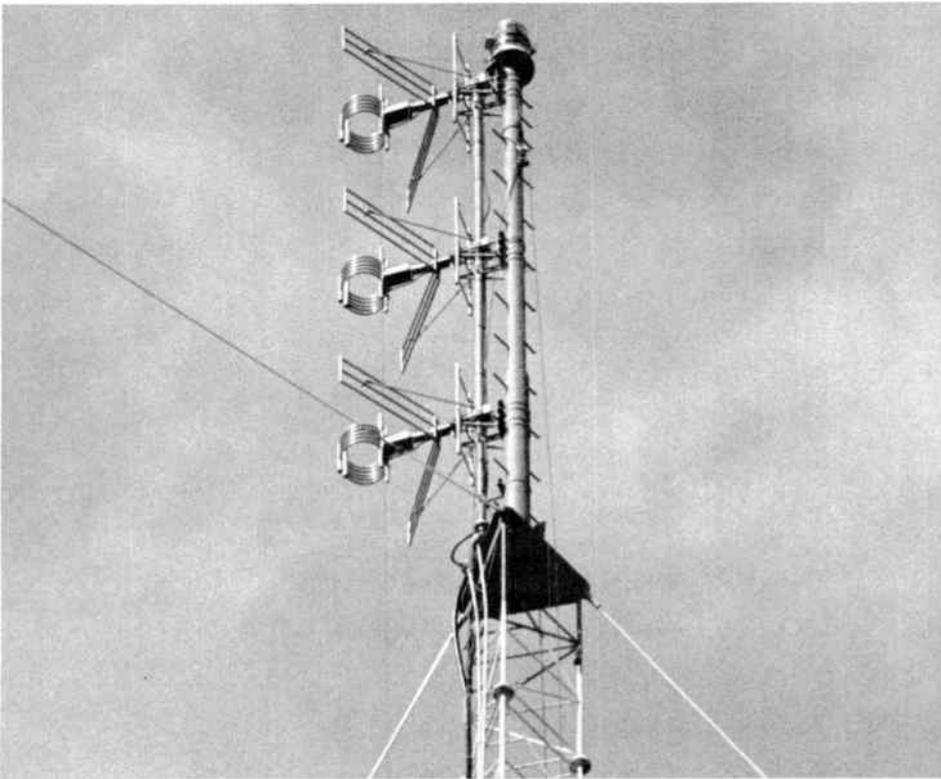
Designed specifically for Class "C" stations, the Dual Cycloid is available in any number of bays from 1 through 16. The standard configuration is a 50-50 power split with other power splits available on special request. Antennas of 9 bays or less are end fed through a 6 foot transmission line section while 10 or more bays are usually center fed through a 6 foot transmission line section, 90 degree elbow and coaxial "T" connector.

For the Class "B" stations, Gates supplies the Dual Cycloid II, which has all the electrical advantages of the higher power antenna. Because of lower power requirements, the Dual Cycloid II is constructed with a shorter balun, resulting in a lighter weight antenna and less windloading of the element. The Dual Cycloid II comes in from 4 to 12 bays handling powers up to 10 kW.

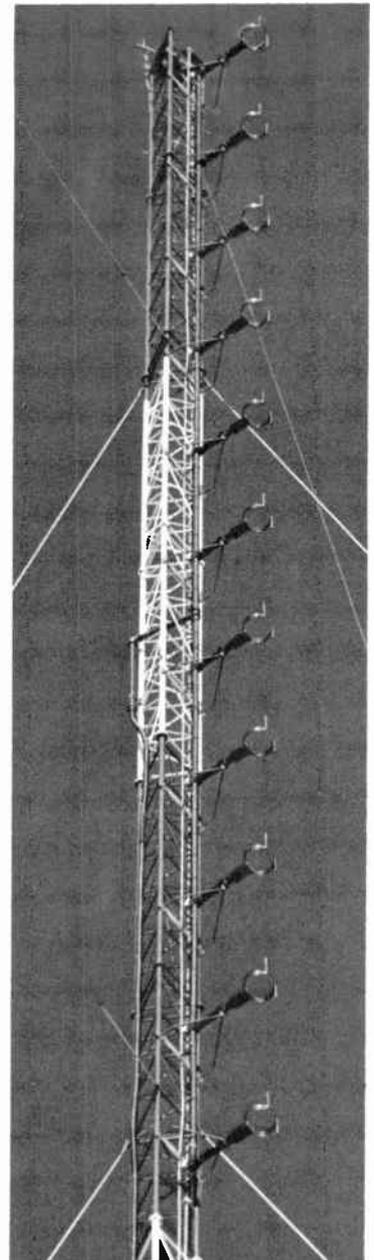
Hundreds of Class "A" FM stations are now equipped with the Dual Cycloid III, the end fed version of the medium power antenna. Weight and windloading are again reduced by removal of the center fed T section. The antenna is available in from 1 to 8 bays with handling power capabilities up to 5 kW.

Gates is continuing its leadership in the FM antenna field by providing Directional FM antennas to stations on the East and West coasts, the Great Lakes and Gulf of Mexico regions, and in areas where protection to stations on the same or adjacent operating frequencies is required.

# A Cross Section of Gates Antenna Installations



At station WKZN-FM, Kenosha, Wis., Gates' Directional Dual Cycloid FM antenna is pole mounted. Each bay of the directional antenna is equipped with heaters totaling 900 watts.

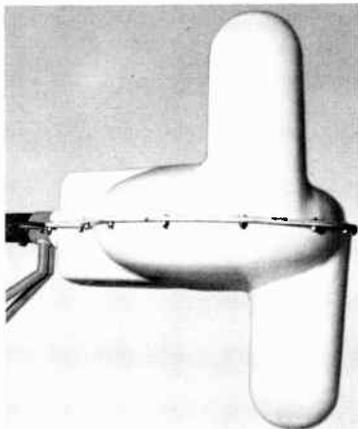
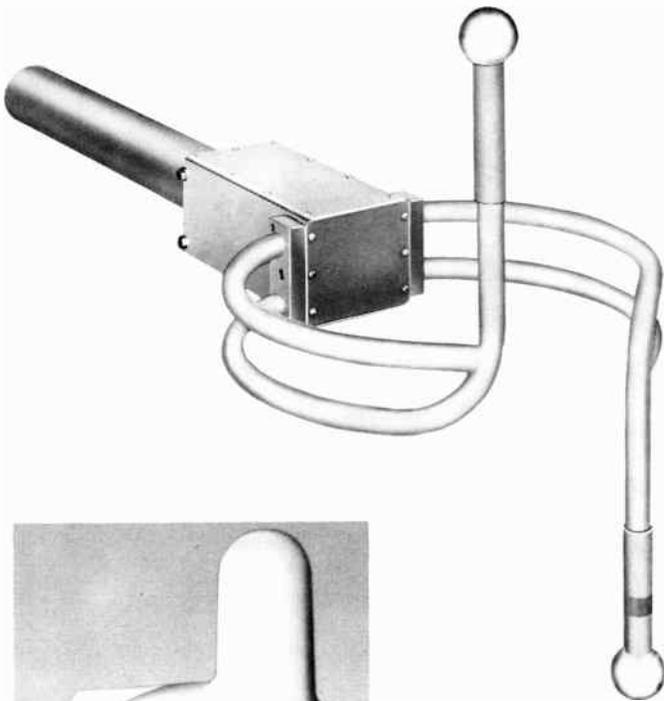


Station KGRC-FM, Hannibal, Mo., operates with a Gates' 11-bay Dual Cycloid circularly polarized FM antenna for an ERP of 100,000 watts. Primary coverage area has a population of 330,000 while secondary area has more than one million.



Models hold one element of the Gates' Dual Cycloid circularly polarized antenna which is now mounted atop the antenna tower at station WSM-FM, Nashville, Tenn. The antenna installation consists of 14-bays.

# Circularly Polarized FM Antenna



Radomes are available with the Dual Cycloid antennas.

## DUAL-CYCLOID

### FOR HIGHER POWER STATIONS

Gates Dual Cycloid FM Antenna with circular polarization has a radiation pattern intended to deliver an improved signal to FM receivers. A primary advantage of the Dual-Cycloid antenna is the reduction of antenna transmitting bays required when circular polarization is desired. Previously, individual elements, horizontal and vertical, and in most cases a power divider, had to be installed to obtain dual polarization. Now, only the Gates Dual-Cycloid is required.

Utilizing the time proven features of the Cycloid antenna, and other advantages of the Gates Type 300G vertical antenna, the Dual-Cycloid provides a radiating system with a low standing wave ratio over a bandwidth of 200 kHz. Ideal conditions are presented for the transmission of today's complex FM monaural, stereo, and SCA multiplex signals.

The Gates Dual-Cycloid Type FMC antenna transmits circular polarization as authorized by FCC rules and regulations. The station's effective radiated power will still be determined by the signal radiated in the horizontal plane. This is determined by the antenna gain (see table) in the horizontal plane multiplied by the power input to the antenna.

Any number of elements from one to sixteen may be utilized, providing maximum flexibility in the selection of power gain for a particular installation. Special antennas with null fill and beam tilt are available. Maximum power rating per bay is ten kilowatts; arrays will handle power inputs as high as forty kilowatts. De-icers are available and are recommended for climates that experience icing conditions.

The Dual-Cycloid consists of two basic parts: (1) the radiating element and, (2) the interconnecting transmission line sections. The radiating elements in an array are all identical electrically and mechanically. Utilizing the effective ring design of the Cycloid as the basic unit, two vertical elements have replaced the fixed end plates; the rear terminal block is now a matching balun mating the antenna impedance to the interconnecting transmission line.

The vertical sections have adjustable caps for a fine adjustment of the horizontal/vertical radiation ratio. Designed for rugged trouble-free operation, all antenna elements are fabricated of a durable weather resistant brass alloy with excellent electrical properties.

Antenna elements are normally spaced one wave-length apart with interconnecting transmission line sections and feed through a common system input termination of 50 ohms, which is a standard 3/8" EIA female flange.

**MOUNTING:** The antenna is mounted on a specially designed supporting bracket, fabricated to mate with the tower in a mounting arrangement specified by the purchaser. Antennas are usually mounted on the leg or tower face of a guyed or self supporting tower. Pole or top mounting is available on special order.

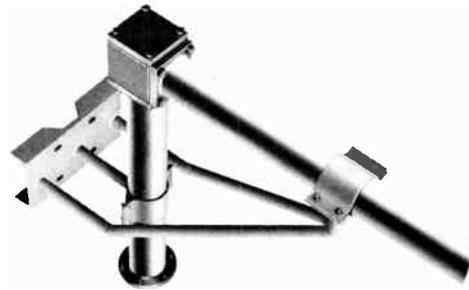
**FEED POINT:** Antennas of 9 bays or less are end fed through a 6 ft. transmission line section; 10 or more bays are usually center fed through a 6 ft. transmission line section, 90° elbow and coaxial "T" connector.

**CIRCULARITY:** Both the horizontal and vertical radiation pattern of the Dual-Cycloid antenna have been measured within  $\pm 2$  dB in free space. When side mounted, the antenna pattern will be somewhat affected by the supporting structure. This effect, however, has been minimized with the special supporting bracket and feed system which places the radiating element over 36" from the tower.

Supplied on a standard 3/8" EIA line, the antenna is complete with mounting brackets for standard AM and FM towers.

# Circularly Polarized FM Antenna—Dual-Cycloid

Heavy-duty mounting brackets, designed to place the antenna element away from the supporting structure for the least effect on the radiation pattern, are supplied at no additional cost. Standard brackets are for use on tower legs or side mounting on the normal type AM radiator. A special quotation will be made for brackets on TV towers and non-standard radiators and poles.



## SPECIFICATIONS

**FREQUENCY RANGE:** Factory tuned to one frequency in the 88 to 108 MHz band.

**POLARIZATION:** Circular, clockwise.

**POWER GAIN (Over Dipole):** Approximately equal to half the number of stacked bays for horizontal polarization; same for vertical polarization. See table below.

**AZIMUTHAL PATTERN:** Circular  $\pm 2.0$  dB in free space for horizontal polarization; same for vertical polarization. See table below.

**VSWR AT INPUT (Without field trimming):** Top mounting, 1.1:1 or better. Side mounting, 1.5:1 or better.

**VSWR AT INPUT (With field trimming):** Top or side mounting, 1.1:1 or better over  $\pm 100$  kHz.

**INPUT IMPEDANCE:** 50 ohms.

**INPUT CONNECTION:** 3/8-inch, 50 ohm EIA female flange.

**POWER INPUT RATING:** Approximately 10 kW per bay (see table).

**WINDLOAD:** 50 lbs. per square foot for flat surfaces; 33 lbs. per square foot for cylindrical surfaces.

**DIMENSIONS:** (One bay) 30 in. high, 45 1/2 in. long.

**FEED POINT:** One to nine bays, end fed. Ten bays and over, center fed with even number of bays, or at a point 1/2 bay below center with odd number of bays.

**WEIGHT:** Antenna bay, 41 lbs. (19 kg). Interconnecting feed line, 27.5 lbs. (12 kg). Mounting bracket, 22 lbs. (10 kg).

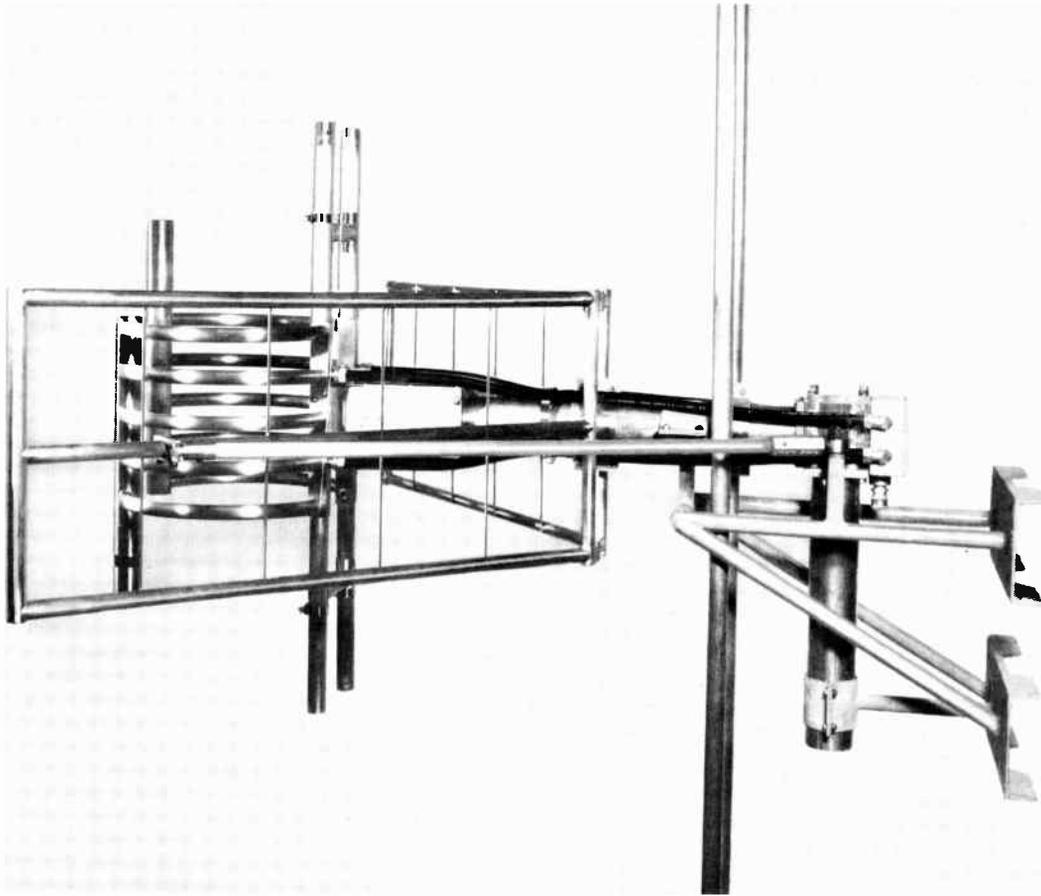
GATES TYPE	POWER GAIN		dB GAIN		FIELD GAIN <sup>1</sup>		POWER RATING	APPROX. <sup>2</sup> LENGTH	WEIGHT <sup>3</sup> (lbs.)	WIND- <sup>4</sup> LOAD
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical				
FMC-1	0.46	0.46	-3.37	-3.37	0.678	0.678	10 kW	0	41	172
FMC-2	1.0	1.0	0	0	1.0	1.0	20 kW	10 ft.	110	391
FMC-3	1.5	1.5	1.76	1.76	1.23	1.23	30 kW	20 ft.	178	610
FMC-4	2.1	2.1	3.22	3.22	1.45	1.45	40 kW	30 ft.	247	829
FMC-5	2.7	2.7	4.31	4.31	1.64	1.64	40 kW	40 ft.	315	1049
FMC-6	3.2	3.2	5.25	5.25	1.79	1.79	40 kW	50 ft.	384	1268
FMC-7	3.8	3.8	5.80	5.80	1.95	1.95	40 kW	60 ft.	452	1487
FMC-8	4.3	4.3	6.34	6.34	2.07	2.07	40 kW	70 ft.	520	1707
FMC-9	4.9	4.9	6.87	6.87	2.21	2.21	40 kW	80 ft.	589	1926
FMC-10	5.5	5.5	7.40	7.40	2.35	2.35	40 kW	90 ft.	658	2192
FMC-12	6.6	6.6	8.20	8.20	2.57	2.57	40 kW	110 ft.	795	2630
FMC-14	7.8	7.8	8.29	8.29	2.79	2.79	40 kW	130 ft.	931	3069
FMC-16	8.9	8.9	9.49	9.49	2.98	2.98	40 kW	150 ft.	1069	3507

Equipment furnished: antenna elements as required; antenna mounting hardware (specify tower manufacturer and type); interconnecting rigid coax transmission line section (6 ft.); standard 3/8-inch EIA female flange.

Accessory equipment: RF shielded deicer system, 300 watts per bay, 115 volts, 50/60 Hz . . . complete with conduit boxes and RF shielded interbay wiring harness. Thermo-switch for control of deicers. AC heater cable.

1. To obtain the effective free space field intensity at one mile in mv/m for one kilowatt antenna input power, multiply field gain by 138. 2. When determining coax line lengths on end feed antenna, add 6' to allow for matching stub. When determining coax line lengths on center feed antenna, termination will be 6' below center due to matching stub. 3. A typical leg mounting bracket weighs approximately 22 lbs. and is not included in weights given. 1 per bay required. Weights given included antenna bay and interconnecting feedline. 4. Based on 50 psf wind pressure on flat surfaces, 33 psf on cylindrical surfaces (110 mph actual wind velocity).

# Directional Dual Cycloid FM Antenna



Gates' FMC-(X)DA is a directional dual polarized FM antenna designed for pole mounting. The antenna is available with up to eight bays (the X in the type number indicates the number of bays—the 4-bay antenna is FMC-4DA, etc.). The interbay transmission feed line uses  $3\frac{1}{8}$ -inch rigid coaxial line. Spacing between bays is one wavelength.

Typical horizontally measured relative field patterns for both polarizations are shown in the figures on the next page. Minor variations may be obtained, such as varying the null at  $180^\circ$ , decreasing or increasing the lobes at  $90^\circ$  and  $270^\circ$  by a small amount, or increasing or decreasing the lobe at  $0^\circ$  by a small amount. Any such changes would alter the power gain figures shown in the chart on the next page by a small amount. Extensive change of pattern is only available on a custom basis, and at added cost, since a special study would be required, including extensive pattern testing on the antenna range.

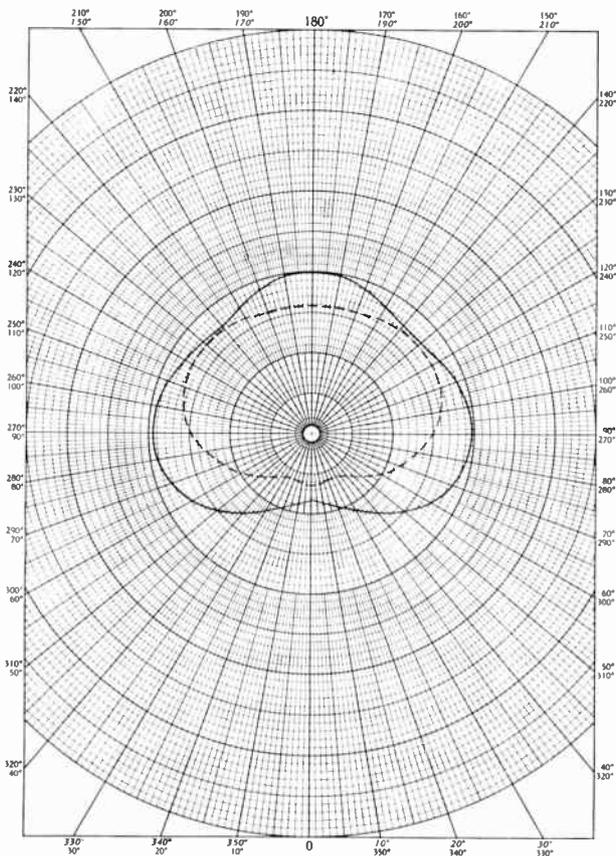
Each antenna bay uses a circularly polarized type driven element, plus one horizontal reflective screen and two parasitic vertical reflectors used for beam shaping to achieve the directional radiation pattern for both polarizations. The directional antenna patterns are developed by mechanical means, no special phasing lines being used. Thus, keeping the driven elements and beam shaping elements in good mechanical condition should be all that is required to maintain the pattern in adjustment.

Orders for the Gates Directional Dual Cycloid should stipulate the desired true azimuth orientation, radiated power limitations, transmitter power output capability, transmission line efficiency (or type and length of such line) and complete dimensions on the size of the pole to be used for the antenna mount. Antenna pattern requirements are normally stipulated by the station's consultant.

Each directional antenna is carefully patterned on an antenna range, not at the customer's site. A single bay of the antenna is mounted on a pole essentially identical in cross section to that on which the antenna is to be finally installed. Thus, it is necessary that the factory be supplied with complete data on pole diameters, step bolt size and location, and the location of any conduits and/or coaxial lines so that they may be duplicated during final testing.

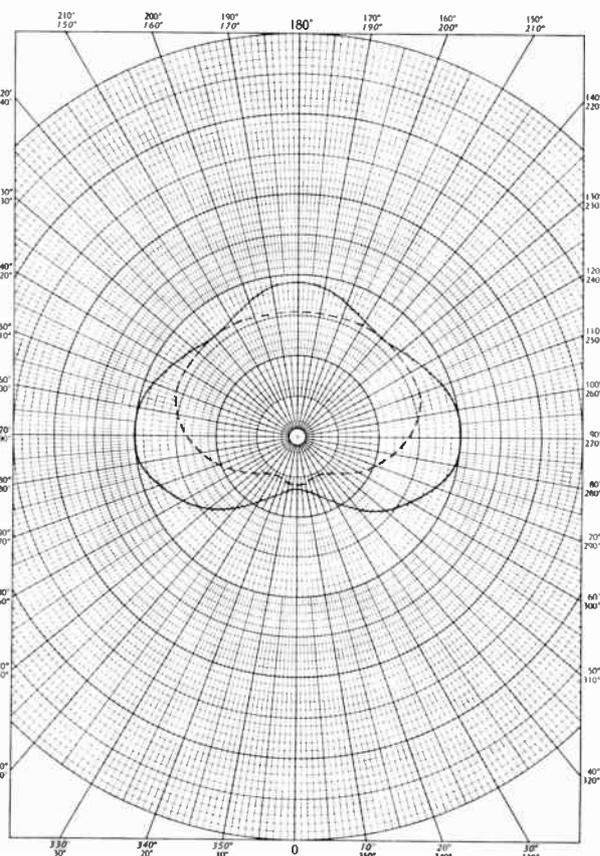
The Directional Dual Cycloid can be equipped with factory installed heaters, and heaters are recommended for installations where icing may occur. A total of 900 watts of heat is used per antenna bay, which should assure proper deicing and maintenance of the antenna pattern during such weather conditions. Six 150-watt, 120-volt elements are used in each heater-equipped bay, and these individual elements may be replaced in the field. If a 240-volt supply for the heaters is desired, the order should so state so that heaters may be properly connected.

# Directional Dual Cycloid FM Antenna



**PATTERN "A"**  
Horizontal Relative Field Patterns

Solid line—horizontal polarization      Dashed line—vertical polarization  
HRMS 0.830                                      HRMS 0.659



**PATTERN "B"**  
Horizontal Relative Field Patterns

Solid line—horizontal polarization      Dashed line—vertical polarization  
VRMS 0.798                                      VRMS 0.619

GATES TYPE	PATTERN "A"		PATTERN "B"		APPROX. WEIGHT*	CALCULATED WIND LOAD—50/33 PSF#
	Horiz. Pwr. Gain	Vert. Pwr. Gain	Horiz. Pwr. Gain	Vert. Pwr. Gain		
FMC-1DA	0.795	0.575	0.878	0.564	137 lbs.	354
FMC-2DA	1.71	1.23	1.89	1.21	284 lbs.	738
FMC-3DA	2.66	1.92	2.94	1.89	432 lbs.	1122
FMC-4DA	3.63	2.62	4.02	2.59	579 lbs.	1506
FMC-5DA	4.61	3.33	5.11	3.28	727 lbs.	1809
FMC-6DA	5.61	4.05	6.20	3.99	874 lbs.	2274
FMC-7DA	6.60	4.77	7.30	4.69	1022 lbs.	2658
FMC-8DA	7.60	5.49	8.42	5.41	1169 lbs.	3042

The above power gain figures will vary with the pattern shape. The power gain figures are given merely as a guide for roughly determining the number of bays required. Some variance may be expected in designing a given directional pattern, so that the exact gain figures are not known until the directional antenna pattern is finally achieved. Using pole mounting, the patterns should be quite similar to those patterns shown, but minor pattern changes may be achieved to fit given requirements.

\* Weight includes interbay line, transformer section, brackets, heaters, heater junction boxes and heater wiring.

# 50 PSF wind pressure on flat surfaces, 33 PSF on cylindrical surfaces (110 MPH actual wind velocity). Wind load calculations include interbay line, transformer section, brackets, heater junction boxes and external heater wiring.

# Circularly Polarized FM Antenna



## DUAL-CYCLOID II FOR MEDIUM POWER STATIONS

Gates' Dual-Cycloid II circularly polarized FM antenna provides all of the electrical advantages of the Dual-Cycloid, in a lighter weight, low silhouette design for minimum windloading. The antenna features center feed for medium power handling capabilities—from four to twelve bays handle transmitter powers through 10 kilowatts. Antenna elements are normally spaced one wavelength apart with interconnecting transmission line sections and feed through a common antenna system input termination of 50 ohms, with a standard 3/8-inch EIA female flange.

The vertical sections have adjustable caps for the fine adjustment of the horizontal/vertical radiation ratio. All antenna elements are fabricated of a durable, weather-resistant brass alloy. Null fill and beam tilt available. Standard brackets for mounting the antenna on the tower leg are included with the antenna. Optional deicers consist of two 150-watt heating elements per bay, replaceable in the field. Interbay wiring is not included. Order Type FMC-(X)B. (X indicates the number of bays required.)

## SPECIFICATIONS

**FREQUENCY RANGE:** Factory tuned to one specific frequency in the 88 to 108 MHz band.

**POLARIZATION:** Circular, clockwise.

**FREE SPACE PATTERN:** Horizontal component circular  $\pm 2$  dB.  
Vertical component circular  $\pm 2$  dB.

**VERTICAL TO HORIZONTAL POWER RATIO:** Fixed at 50/50.

**VSWR:** 1.2 to 1 or better  $\pm 200$  kHz as tuned at the factory.  
VSWR when tower mounted 1.5 to 1 or better  $\pm 200$  kHz. Capable of

adjustment 1.1 to 1  $\pm 100$  kHz with field tuning.

**POWER GAIN:** Horizontal polarization: see table. Vertical polarization: see table.

**POWER INPUT RATING:** Maximum of 10 kW.

**INPUT CONNECTION:** 3/8" EIA female flange, 50 ohm.

**WINDLOAD:** Designed for 50 psf for flat surfaces, 33 psf for cylindrical surfaces.

GATES TYPE	POWER GAIN		dB GAIN		FIELD GAIN <sup>1</sup>		POWER RATING	APPROX. <sup>2</sup> LENGTH	WEIGHT <sup>3</sup> (Lbs.)	WIND- <sup>4</sup> LOAD
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical				
FMC-4B	2.025	2.025	3.064	3.064	1.423	1.423	10 kW	30	147	340
FMC-5B	2.577	2.577	4.111	4.111	1.605	1.605	10 kW	40	175	412
FMC-6B	3.134	3.134	4.961	4.961	1.770	1.770	10 kW	50	204	485
FMC-7B	3.695	3.695	5.676	5.676	1.922	1.922	10 kW	60	232	557
FMC-8B	4.258	4.258	6.292	6.292	2.063	2.063	10 kW	70	261	629
FMC-9B	4.823	4.823	6.833	6.833	2.196	2.196	10 kW	80	289	701
FMC-10B	5.390	5.390	7.316	7.316	2.322	2.322	10 kW	90	318	773
FMC-11B	5.958	5.958	7.751	7.751	2.441	2.441	10 kW	100	346	845
FMC-12B	6.527	6.527	8.147	8.147	2.555	2.555	10 kW	110	375	917

- To obtain the effective free space field intensity at one mile MV/M for one kilowatt antenna power, multiply field gain by 137.6.
- The feed point of center fed antennas is 10 ft. below the center of the antenna. Center fed antennas have a 3/8" line input.
- The weights given are less brackets, but the interbay transmission line, transformer section, the center fed tee section and elbow, are all included in the weight.
- Windload based on 50 psf on flat surfaces and 33 psf for cylindrical surfaces (actual wind velocity 110 mph). Computed for 100 MHz antenna less mounting brackets and less heater junction boxes and heater cables.

# Circularly Polarized FM Antenna

## DUAL-CYCLOID III

### FOR STATIONS UP TO 5 KILOWATTS

Designed for lower power stations, Gates' Dual-Cycloid III circularly polarized FM antenna is an end-fed version of the Dual-Cycloid II—it is lighter in weight, and has less windloading. From one to eight bays handle transmitter powers through 5 kilowatts.

The antenna consists of a 1½-inch transmission line with individual bays separated by approximately one wavelength at the operating frequency. All antenna elements are fabricated of a durable, weather-resistant brass alloy. Null fill and beam tilt are not available on the Dual-Cycloid III.

Deicers consist of two 150-watt heating elements per bay—interbay wiring is not included. These elements are factory installed, and are replaceable in the field. Standard brackets for mounting the antenna on the tower leg are included with the antenna. Order Type FMC-(X)A. (X indicates the number of bays required.)



## SPECIFICATIONS

**FREQUENCY RANGE:** Factory tuned to one specific frequency in the 88-108 MHz band.

**POLARIZATION:** Circular, clockwise.

**FREE SPACE PATTERN:** Horizontal component circular  $\pm 2$  dB. Vertical component circular  $\pm 2$  dB.

**VERTICAL TO HORIZONTAL RATIO:** Fixed at 50/50.

**VSWR:** 1.2 to 1 or better  $\pm 200$  kHz as tuned at the factory. VSWR when tower mounted 1.5 to 1 or better  $\pm 200$  kHz. Capable of adjustment to 1.1 to 1  $\pm 100$  kHz with field tuning.

**POWER GAIN:** Horizontal polarization: see table. Vertical polarization: see table.

**POWER INPUT RATING:** Maximum of 5 kW for two to eight bays. 3 kW for single bay.

**INPUT CONNECTION:** A six foot transformer section is provided on the bottom of each antenna system which has a 1½" 50 ohm EIA female connector.

**WINDLOAD:** Designed for 50 psf for flat surfaces, 33 psf for cylindrical surfaces.

**WEIGHT:** Single bay 24 lbs., less brackets. 1½" interbay coaxial line weighs approximately 10 lbs. per section.

**DIMENSIONS:** Single bay height approximately 42". Length approximately 16".

GATES TYPE	POWER GAIN		dB GAIN		FIELD GAIN <sup>1</sup>		POWER RATING	APPROX. <sup>2</sup> LENGTH	WEIGHT <sup>3</sup> (Lbs.)	WIND- <sup>4</sup> LOAD
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical				
FMC-1A	0.438	0.438	-3.585	-3.585	0.662	0.662	3 kW		24	54
FMC-2A	0.947	0.947	-0.237	-0.237	0.973	0.973	5 kW	10	53	126
FMC-3A	1.480	1.480	1.702	1.702	1.216	1.216	5 kW	20	81	198
FMC-4A	2.025	2.025	3.064	3.064	1.423	1.423	5 kW	30	110	271
FMC-5A	2.577	2.577	4.111	4.111	1.605	1.605	5 kW	40	138	343
FMC-6A	3.134	3.134	4.961	4.961	1.770	1.770	5 kW	50	167	414
FMC-7A	3.695	3.695	5.676	5.676	1.922	1.922	5 kW	60	196	486
FMC-8A	4.258	4.258	6.292	6.292	2.063	2.063	5 kW	70	225	558

- To obtain the effective free space field intensity at one mile in MV/M for one kilowatt antenna power, multiply field gain by 137.6.
- When determining coax length, add six feet to antenna length.
- The weights given are less brackets, but the interbay transmission line and transformer section are all included in the weight.
- Windload based on 50 psf on flat surfaces and 33 psf for cylindrical surfaces (actual wind velocity 110 mph). Computed for a 100 MHz antenna less mounting brackets and less heater junction boxes and heater cables.

# Horizontally and Vertically Polarized FM Antennas



**CYCLOID**

Gates' Cycloid horizontally polarized FM antenna fills the need for a modern, easy to install and highly efficient antenna, with minimum standing wave ratio for FM stereo and monaural service. The field-proven Cycloid offers high gain and high power handling capabilities incorporated in an electrical design available exclusively from Gates.

The antenna is factory pretuned to the customer's frequency, assuring optimum on-the-air performance. Mounting brackets are supplied as a standard item. The Cycloid antenna is available with any number of bays from one to sixteen and with 1 $\frac{1}{8}$ -inch or 3 $\frac{1}{8}$ -inch line. See Gates' catalog (#99) price list for complete listing.

## SPECIFICATIONS

**FREQUENCY RANGE:** Factory tuned to specified frequency in 88-108 MHz band.

**POLARIZATION:** Horizontal.

**HORIZONTAL PATTERN:** Circular,  $\pm 1.0$  dB in free space.

**INPUT IMPEDANCE:** 50 ohms, on 1 $\frac{1}{8}$ " or 3 $\frac{1}{8}$ " coax.

**FEED POINT:** 1 to 8 bays inclusive—end feed. 9 to 16 bays inclusive—center feed.

**POWER RATING:** 3 kW per section on 1 $\frac{1}{8}$ " line.

**VSWR:** (With field tuning) Top mounting, 1.1 to 1. Side mounting, 1.1 to 1. (Factory tuned) Top mounting 1.2 to 1. Side mounting, 1.5 to 1.

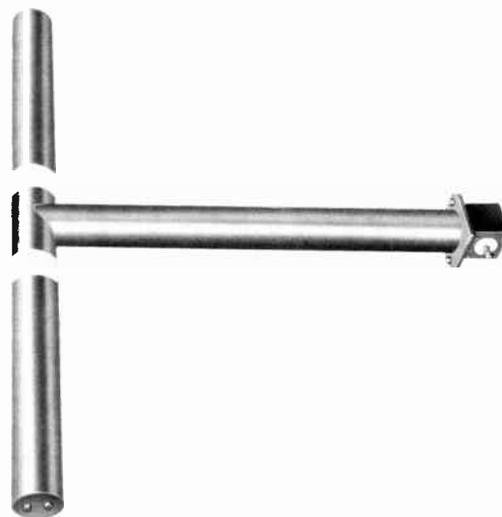
**WINDLOAD:** 20 lbs. per square foot.

**DIMENSIONS:** (One bay): Height (over-all), 6 inches. Ring diameter, approx. 18 inches (depends on frequency).

**WEIGHT:** Antenna, 25 lbs. per ring. 1 $\frac{1}{8}$ " line, 12 $\frac{1}{2}$  lbs. per 10 ft. section. 3 $\frac{1}{8}$ " line, 27 $\frac{1}{2}$  lbs. per 10 ft. section.

**EQUIPMENT FURNISHED:** Antenna mounting hardware (specify tower make, height and type number when ordering). Correct number of antenna elements as ordered. Interconnecting rigid coax (1 $\frac{1}{8}$ " or 3 $\frac{1}{8}$ ") as ordered. Standard EIA (1 $\frac{1}{8}$ " or 3 $\frac{1}{8}$ ") flanges as ordered.

**ACCESSORY EQUIPMENT (Optional):** Deicers: 300 watts (FMH-300). 600 watts (FMH-600). Antenna Heater Control.



**TYPE 300G**

The 300G vertically polarized FM antenna enables an FM station to transmit a supplemental vertically polarized signal to achieve elliptical or circular polarization as authorized in the FCC Rules and Regulations. It may be used in combination with any type of horizontally polarized FM antenna.

Both the 1 $\frac{1}{8}$ -inch and 3 $\frac{1}{8}$ -inch vertical antennas carry type number 300G. As these antennas are usually ordered as a system of several bays with connecting lines and breakers, the Gates price list is employed for more complete listings. Power division networks, both variable and fixed, are available to combine vertical and horizontal antennas, and are listed in Gates' catalog (#99) price list.

## SPECIFICATIONS

**FREQUENCY RANGE:** Factory tuned to specified frequency in 88-108 MHz band.

**POLARIZATION:** Vertical.

**POWER GAIN:** Approximately equal to number of dipoles.

**HORIZONTAL LINEARITY:** Dipole circular  $\pm 1$  dB in free space.

**INPUT IMPEDANCE:** 50 ohms on 1 $\frac{1}{8}$ " or 3 $\frac{1}{8}$ " coax.

**FEED POINT:** For 9 bays or less, the antenna is end fed. For 10 bays or more, the antenna is center fed where number of bays is even, and for odd number of bays feed point is  $\frac{1}{2}$  bay length below center.

**POWER RATING:** 3 kW per dipole.

**VSWR:** Tuned to 1.1:1 or less; less than 1.5:1 when mounted on side of tower.

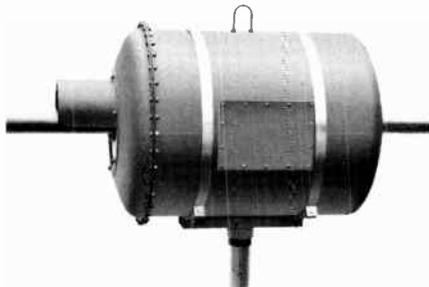
**WINDLOAD:** 60 psf. on flat surfaces, 40 psf. on cylindrical surfaces (123 mph actual wind velocity).

**DIMENSIONS:** Length of dipole—3.75 ft. From center of transmission line to center of dipole—2.83 ft.

**WEIGHT:** 1 $\frac{1}{8}$ " dipole—26.5 lbs. 3 $\frac{1}{8}$ " dipole—34.0 lbs. Typical mounting bracket—22.0 lbs. per bay.

**DEICERS:** Not required.

# FM Isolation Transformers, Antenna Accessories



25 kW ISOLATION TRANSFORMER.

The FM isolation transformer is designed to couple FM transmitter power across the base of an insulated tower used jointly as an AM and FM radiator, without objectionable mismatch being introduced into the FM transmission line. Single AM antennas and antennas which are part of an AM directional antenna system are not affected when the isolation transformer is used.

## SPECIFICATIONS

(7.5, 10 and 25 kW Units)

**FREQUENCY:** 88 to 108 MHz (adjusted to the customer's operating frequency at the factory).

**VSWR:** Less than 1.05 to 1 on specified frequency,  $\pm 0.5$  MHz when terminated in a matched 50 ohm load.

**POWER RATING:** (Into matched 50-ohm load)

Model 620-0397—7.5 kW

Model 620-0415—10 kW

Model 620-0444—25 kW

**INSERTION LOSS:** 0.10 dB or less.

**INPUT AND OUTPUT:** (7.5 kW unit) EIA 1 $\frac{1}{8}$ " flange, male\* or female. (10 kW unit) EIA 3 $\frac{1}{8}$ -inch flange, female. (25 kW unit) 3 $\frac{1}{8}$ -inch 50 ohm EIA male flange will mate with the 3 $\frac{1}{8}$ -inch female flange such as the Andrew type 78-AR-F used on 3 $\frac{1}{8}$ -inch Heliox cable, or the flange on Andrew type 562A 50 ohm 3 $\frac{1}{8}$ -inch rigid coaxial transmission line.

\*Box has EIA male connector. The male to male adapter may be removed if box connects to female fitting. Subtract 6" from flange to flange length for each adapter if removed.

**WEIGHT:** (7.5 and 10 kW units) 48 lbs. (25 kW unit) 255 lbs.

**LENGTH:** (7.5 and 10 kW units) 20" flange to flange. (25 kW unit) 39" flange to flange.

**MOUNTING:** (7.5 and 10 kW units) 2" pipe flange on bottom of box. (25 kW unit) Separate 3" pipe flange on bottom. Two stainless steel straps secure tank to cradle.

**PRESSURIZATION:** Designed for use in a pressure system with gas passing through the unit. (Normal pressure 3 to 5 lbs. per square inch using dry air or dry gas.)

## ORDERING INFORMATION

7.5 kW Isolation Transformer, adjusted to the customer's operating frequency at the factory. Standard EIA 1 $\frac{1}{8}$ " flanges. For use with a maximum transmitter power of 7.5 kW ..... 620-0397

10 kW Isolation Transformer, adjusted to the customer's operating frequency at the factory. Standard 3 $\frac{1}{8}$ " flanges. For use with a maximum transmitter power of 10 kW ..... 620-0415

25 kW Isolation Transformer, adjusted to the customer's operating frequency at the factory. Standard EIA 3 $\frac{1}{8}$ " flanges. For use with a maximum transmitter power of 25 kW ..... 620-0444

## FM ANTENNA ACCESSORIES



**AUTOMATIC ANTENNA HEATER CONTROL SYSTEM:** (shown above). Fully automated control of FM, TV and other types of electrically operated broadcast and communications antenna heater systems. Suitable alarms indicate visually and aurally existing weather conditions and register partial and total heater failure.

## SPECIFICATIONS

**POWER INPUT:** 115 VAC, 60 Hz.

**INPUTS:** Temperature sensors; precipitation sensor; heater failure sensor.

**INDICATORS:** Rain, freeze, low temperature, heaters, heater fail. Selectable aural alarm for any or all of those listed.

**MOUNTING:** Standard 3 $\frac{1}{2}$ " x 19" rack panel. 8 inches deep.

**OPTIONS:** 12 VDC function outputs for telemetering status data. Model 2570-CA calibration box. Power contactors and enclosures.

**ORDER NUMBER:** (Antenna heater control system) ..... 710-0139

**REPLACEMENT ANTENNA HEATER ELEMENTS:**

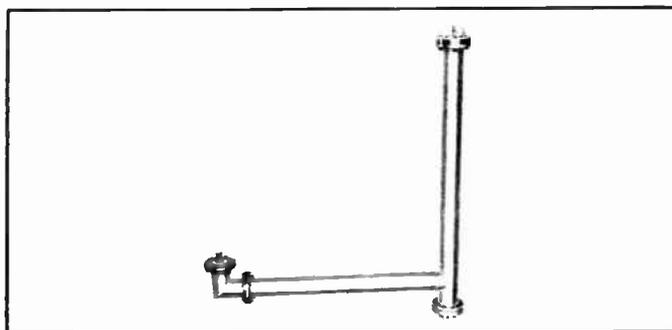
Dual-Cycloid Antennas (2 elements per bay) ..... 710-0136

Dual-Cycloid II (2 elements per bay) ..... 710-0137

Cycloid Antenna (2 elements per bay) ..... 710-0138

**AC HEATER CABLE AND CONDUIT:**

Includes installation. Only available when a tower or FM antenna is being installed.



**FIXED POWER DIVIDER:** (shown above). Custom designed to divide power for vertical and horizontal antennas to customer's specifications. Special order.

With 3 $\frac{1}{8}$ " EIA input and 3 $\frac{1}{8}$ " EIA output for both horizontal and vertical antennas.

With 1 $\frac{1}{8}$ " EIA input and 3 $\frac{1}{8}$ " EIA output for both horizontal and vertical antennas.

With 3 $\frac{1}{8}$ " EIA input and 1 $\frac{1}{8}$ " EIA output for both horizontal and vertical antennas.

With 1 $\frac{1}{8}$ " EIA input and 1 $\frac{1}{8}$ " EIA output for both horizontal and vertical antennas.



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# GATES

FM MONITORS



# STEREO MODULATION MONITOR



**MODEL GTM-88S**

Now . . . Gates monitors Gates. With three solid state FM monitors— fully FCC type approved, and thoroughly field tested. Now . . . Gates offers you the most complete line of FM broadcast equipment available under one label, from a single manufacturer.

## **Stereo Modulation Monitor Features**

- Provision for adding SCA adapter
- Integrated Circuits for Dependability
- All Controls Accessible from Front Panel
- Silicon Solid State Circuitry
- Modular Construction
- Front Panel Control of Instrument Outputs

## **Operating Advantages**

The GTM-88S measures all modulation characteristics of an FM monaural or stereo signal in accordance with FCC requirements. All normal operating controls are accessible from the front panel. Instrument outputs for the right and left channels on the rear of the monitor can be connected

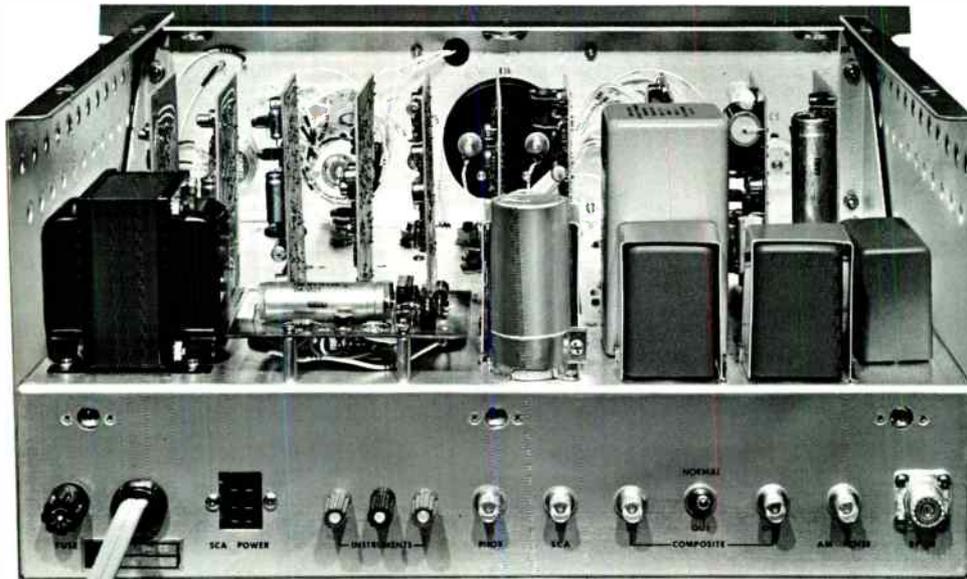
to such auxiliary test equipment as oscilloscopes, distortion analyzers and frequency monitors, which may remain connected without affecting monitor performance or accuracy. Left channel instrument output switchable to either channel by front panel control.

## **Modular Circuitry**

Printed circuit construction is used throughout, and, combined with the total solid state design, improves overall dependability. The silicon transistors and integrated circuits were selected as they resist the effects of aging, moisture, and temperature variation, and assure stable operation even under adverse operating conditions.

## **Advanced Design**

Space age integrated circuits combine all circuit components into a single silicon semi-conductor device, thus eliminating many physical components as well as their associated interconnections. These compact circuits, coupled with advanced solid state design, add to the overall product reliability and performance. Provision has been made for the addition of an SCA adapter to measure SCA modulation in accordance with FCC rules and regulations.



Rear View With Cover Removed

## SPECIFICATIONS

### ELECTRICAL

- Operating Frequency: 87.5 to 108 MHz.
- RF Input Impedance: 50 ohms, unbalanced.
- RF Input Sensitivity: 0.1 to 1 watt.
- Comp. Input Sensitivity: 0.7 V Peak-to-peak for 100% modulation.
- Comp. Input Impedance: 4,000 ohms.
- Comp. Output: 3 V Peak-to-peak at 100% modulation.
- Comp. Output Impedance: 600 ohms.
- Comp. Output Freq. Res.:  $\pm 0.5$  dB, 30 Hz to 100 kHz.
- 19 kHz Output: 0.75 V Peak-to-peak into 20 k $\Omega$  load.
- Headphones Output: Levels for loads from 4 ohms to several megohms with distortion 1% or less. Separate level control.
- Power Requirements: 100-130 VAC, 50/60 Hz, 40 watts.
- FCC Type Approval: No. 3-144.

### INSTRUMENT OUTPUT (LEFT OR RIGHT)

- Impedance: 20,000 ohms.
- Frequency Response:  $\pm 0.5$  dB, 50 Hz to 15 kHz.
- Distortion (Monaural): 0.25% or better from 50 Hz to 15 kHz at 100% modulation.
- Distortion (Stereo): 0.5% or better from 50 Hz to 15 kHz at 100% modulation.
- Internal Noise: -70 dB or better in mono or stereo below 100% modulation at 400 Hz.
- Channel Separation: 35 dB or better 50 Hz to 15 kHz.

### CROSSTALK CAPABILITY

- Main to Sub: 50 dB or better.
- Sub to Main: 55 dB or better.
- SCA to Main or Sub: 70 dB or better.
- Subcarrier Suppression: 50 dB or better with modulation from 5 to 15 kHz.

### MODULATION METER

- Accuracy:  $\pm 5\%$  or better.
- Ballistics: Conform to FCC rules 73.322 (b).
- Peak Modulation Indicator: Adjustable to indicate from 50% to 120% modulation.
- AM Noise Measurement: AM noise up to -70 dB from 30 Hz to 75 kHz.

### MECHANICAL

- RF Input Connector: UHF plug.
- Dimensions: 19" wide, 8 $\frac{3}{4}$ " high, 14 $\frac{1}{4}$ " deep.
- Weight: 26 lbs. (net).
- Ambient Temperature: 10°C (50°F) to 55°C (131°F).
- Ambient Humidity: 0 to 95% relative.
- Altitude: Sea level to 10,000 feet.
- Mounting: Standard 19" rack panel or free standing.

## ORDERING INFORMATION

GTM-885 FM Stereo Modulation Monitor, complete with crystal,  
calibrated to specified operating frequency ..... 994-6569

# MONAURAL MODULATION MONITOR



**MODEL GTM-88M**

Another engineering first from Gates—incorporating all the advanced performance features of the stereo unit. This monophonic monitor can be readily converted by Gates to stereo operation—with full FCC type approval. The conversion is easily accomplished by plugging in the appropriate modules and filters, then calibrating for stereo. The design also provides for the addition of an adapter for measurement of SCA modulation.

## Performance Features

- Integrated Circuits for Highest Reliability
- Convertible to Stereo Operation
- Provision for Adapting to SCA Operation
- All controls Accessible From Front Panel
- Silicon Solid State Circuitry
- Modular Construction

## Advanced Design

The printed circuit modular construction used in the GTM-88M allows conversion to stereo operation with no wiring

changes. Silicon solid state and silicon integrated circuits used in the monitor were selected for their inherent dependability. Like the stereo model, the GTM-88M permits connection of auxiliary test equipment without affecting monitor accuracy.

## Operational Features

All normal operating controls are on the front panel, with other controls behind a hinged front panel. Controls of the monitors are identical; thus, when converted to stereo the monophonic monitor requires no control changes. The peak modulation indicator is adjustable in 10 degree steps from 50% to 120%.

## General

Separate headphone and instrument outputs receive an FM signal with de-emphasis, while the modulation monitor receives the complete signal with pre-emphasis to provide accurate modulation readings. Compact in size, the monaural modulation monitor was designed for standard rack mounting.



Rear View With Cover Removed

## SPECIFICATIONS

### ELECTRICAL

- Operating Frequency: 87.5 to 108 MHz.
- RF Input Impedance: 50 ohms, unbalanced.
- RF Input Sensitivity: 0.1 to 1 watt.
- Headphone Output: Load levels from 4 ohms to several megohms with 1% or less distortion. Separate level control.
- Power Requirement: 100 to 130 VAC, 50/60 Hz, 40 watts.
- FCC Type Approval: No. 3-145.

### INSTRUMENT OUTPUT

- Impedance: 20,000 ohms.
- Frequency Response:  $\pm 0.5$ dB, 50 Hz to 15 kHz.
- Distortion: 0.25%, 50 Hz to 15 kHz at 100% modulation.
- Internal Noise:  $-70$  dB below 100% modulation at 400 Hz.

### MODULATION METER

- Accuracy:  $\pm 5\%$ .
- Ballistics: Meet FCC rule 73.322 (b).
- Peak Modulation Indicator: Adjustable from 50 to 120% modulation.
- AM Noise Measurement Capability:  $-70$  dB, 30 Hz to 75 kHz.

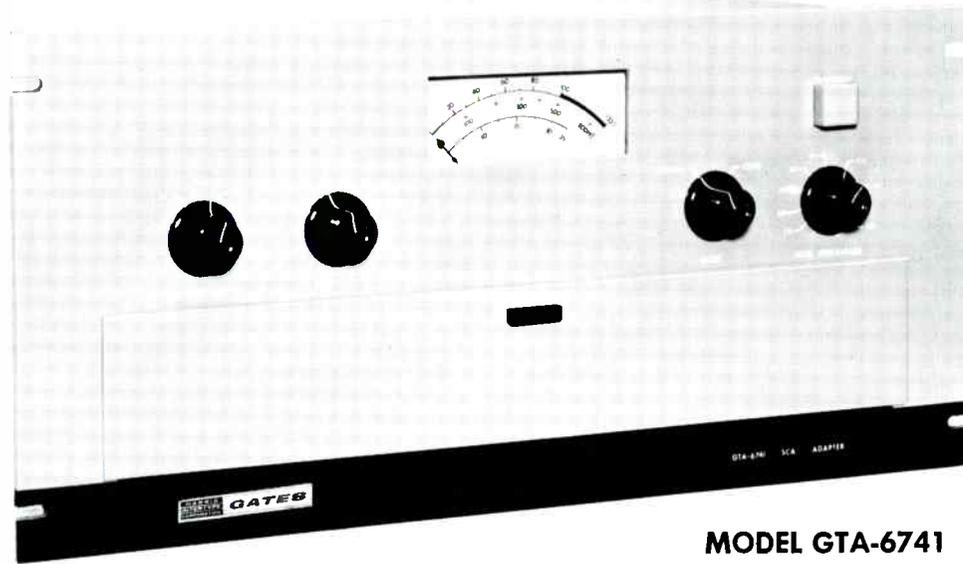
### MECHANICAL

- RF Input Connector: UHF plug.
- Dimensions: 19" wide, 8 $\frac{3}{4}$ " high, 1 $\frac{1}{4}$ " deep.
- Weight: 24 lbs. (net).
- Ambient Temperature: 10° to 55°C (50° to 131° F).
- Ambient Humidity: 0 to 95% relative.
- Altitude: Sea level to 10,000 feet.
- Mounting: Standard 19" rack panel or free standing.

## ORDERING INFORMATION

GTM-88M FM Monaural Modulation Monitor, complete with crystal,  
 calibrated to specified operating frequency ..... 994-6581

# SCA MODULATION MONITOR ADAPTER



MODEL GTA-6741

Gates SCA modulation monitor adapter measures all modulation characteristics of an SCA signal when used in conjunction with Gates FM modulation monitors. This adapter can also be used with the GTA-88F SCA frequency comparator to measure the accuracy of SCA frequencies as specified by the FCC. Total solid state circuitry, plus integrated circuits throughout the GTA-6741, assures trouble-free operation.

A built-in peak modulation flasher provides indication of peak or over-modulation on the SCA channel. The GTA-6741 is also equipped with an instrument output for connection of external test equipment without affecting performance of the adapter. A separate audio output provides a +10 dBm signal to drive an external amplifier. A separate headphone jack is also provided.

Measurements that can be made using this SCA modulation monitor adapter and Gates GTM-88S stereo or GTM-88M monophonic modulation monitor include:

1. SCA channel modulation (41 and/or 67 kHz).
2. Crosstalk—SCA into main channel.
3. Crosstalk—SCA into stereo channel.
4. Crosstalk—Main into SCA channel.
5. Crosstalk—Stereo into SCA channel.
6. Crosstalk—67 kHz into 41 kHz SCA channel.
7. Crosstalk—41 kHz into 67 kHz SCA channel.
8. FM noise measurements—SCA channel.
9. SCA frequency accuracy (when used with Gates GTA-88F frequency comparator).
10. Distortion on the SCA channel (with external distortion analyzer).

## SPECIFICATIONS

**Operating Frequency:** 41 kHz and 67 kHz.

**SCA Peak Modulation Indicator:** Adjustable to indicate from 50% to 120% modulation. Meets FCC Rules 73.332D (4).

### CROSSTALK CAPABILITY

**SCA Into Main Or Sub:** (10% SCA) 70 dB or better.

**Main Into SCA:** (SCA 8:1) 50 dB or better (30 Hz-15kHz).

**Stereo Into SCA:** (SCA 8:1) 40 dB or better (30 Hz-5 kHz).

**41 kHz Into 67 kHz:** (both SCA at 10%) 45 dB (30 Hz-5 kHz).

**67 kHz Into 41 kHz:** (both SCA at 10%) 45 dB (30 Hz-5 kHz).

### AUDIO OUTPUT

**Headphone Output:** Provides sufficient level for headphones from 4 ohms to several megohms. Separate level control provided.  $\pm 1$  dB 30 to 7,500 Hz.

**Audio Output:** +10 dBm at 600 ohms (unbalanced).

### INSTRUMENT OUTPUT

**Impedance:** 20,000 ohms.

**Distortion:** 1% or better (30 Hz-7.5 kHz).

**Frequency Response:**  $\pm 0.5$  dB (30 Hz-7.5 kHz).

### GENERAL

**Power Source:** All DC voltages provided from GTM-88M or GTM-88S FM modulation monitors.

**Size:** 19" wide, 8 $\frac{3}{4}$ " high, 11" deep. Including knobs and rear connectors, 13" deep.

**Weight:** 20 lbs. (net).

**Ambient Temperature:** 10°C to 55°C (50°F to 131°F).

**Ambient Humidity:** 0 to 95% relative.

**Altitude:** Sea level to 10,000 feet.

**Mounting:** Standard 19-inch rack panel or free standing.

## ORDERING INFORMATION

GTA-6741 SCA Modulation Monitor Adapter ..... 994-6591



**MODEL GTM-88F**

## FM FREQUENCY MONITOR

Gates new all solid state FM frequency monitor measures the precise operating frequency of the FM transmitter by utilizing pulse counting techniques. A crystal controlled wide band pulse signal is compared with the FM transmitter center frequency to determine any frequency deviation from the assigned operating channel. The pulse counting technique assures a measurement accuracy of better than 0.001 % , and full compliance with all FCC requirements.

Frequency Range: 88 to 108 MHz (fixed).

Power: 100 to 130 VAC, 50/60 Hz, 40 watts. 19" W x 7" H x 10" D.

GTM-88F FM frequency monitor, complete with crystal, calibrated to specified operating frequency ..... 994-6588

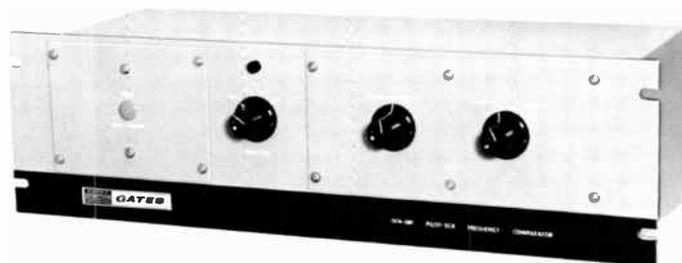
## PILOT-SCA FREQUENCY COMPARATOR

Gates pilot-SCA frequency comparator determines the accuracy of the pilot frequency when used with Gates GTM-88S stereophonic modulation monitor, and SCA frequencies when used with the GTA-6741 SCA modulation adapter. Three integrated circuits, one transistor, and nine diodes (all silicon) are used for stability and reliability. The GTA-88F is factory calibrated, and will provide years of dependable service in full compliance with existing FCC rules.

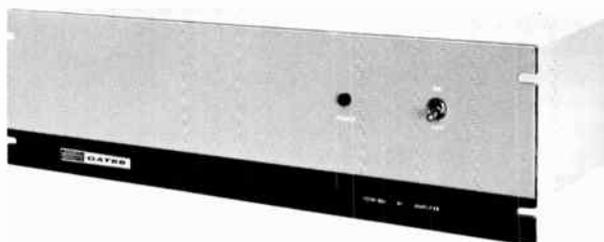
Operating Frequencies: 19, 41 and 67 kHz as supplied.

Power: 100 to 130 VAC, 50/60 Hz, 10 watts. 19" W x 5 1/4" H x 6 3/4" D. (8 3/4" deep with knobs and rear connectors.)

GTA-88F 19 kHz pilot/SCA 41 and 67 kHz frequency comparator ..... 994-6603



**MODEL GTA-88F**



**MODEL GTM-88R**

## FM RF AMPLIFIER

Designed to operate in conjunction with Gates FM frequency and modulation monitors, the GTM-88R amplifier is used at a remote location to provide sufficient RF power to drive the monitors. This is ideal for applications where the monitors are located at the studio and the transmitter is at a remote location. It permits the operator to monitor the frequency and modulation of the transmitter as required by FCC regulations. Solid state silicon circuitry plus extensive use of integrated circuits throughout assures dependable, trouble-free operation.

Frequency Range: 87 to 108 MHz.

Power: 115 V, 50/60 Hz, 12 watts. 19" W x 5 1/4" H x 10" D.

GTM-88R FM RF amplifier complete with antenna, less interconnecting cable ..... 994-6614

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Phone: 829-7006 Area 309

**STOCK CARRYING BRANCH**  
HOUSTON, TEXAS 77027  
4019 Richmond Avenue  
Phone: 666-4333 Area 713

**DISTRICT OFFICES**  
NEW YORK, NEW YORK 10017  
800 Second Avenue  
Phone: 687-7971 Area 212

LOS ANGELES, CALIFORNIA 90007  
1945 South Figueroa  
Phone: 747-7129 Area 213

WASHINGTON, D. C. 20005  
730 Federal Building  
1522 K Street, N.W.  
Phone: 223-5508 Area 202

**EXPORT SALES**  
ROCKE INTERNATIONAL CORPORATION  
13 East 40th Street  
New York, New York 10016  
Phone: 689-0200 Area 212  
Cables: ARLAB

**CANADIAN SALES**  
GATES RADIO COMPANY (CANADA)  
MONTREAL OFFICE  
212 Brunswick Blvd.  
Pointe-Claire, Quebec  
Phone: 695-3751, Area 514

GATES RADIO COMPANY (CANADA)  
TORONTO OFFICE  
19 Lesmill Road  
Don Mills, Ontario  
Phone: 447-7234, Area 416

HARRIS  
INTERTYPE  
CORPORATION

**GATES<sup>®</sup>**

**GATES RADIO COMPANY**  
A Division of Harris-Intertype Corporation  
QUINCY, ILLINOIS, 62301

# GATES

## STEREO PRODUCER FOUR CHANNEL RECORDING MIXER



The Gates Stereo Producer (M-6642) is a solid state four-channel stereophonic production mixer providing all facilities for direct recording, dubbing, sound-on-sound recording, editing and monitoring.

**ADAPTABILITY:** Although designed primarily for recording work, the Stereo Producer is useful for other services not requiring a complete speech input console: for example, news rooms, mobile units and small sub-control rooms.

**SOUND-ON-SCUND:** An exclusive feature of the Stereo Producer is the ability to make sound-on-sound recordings with ease. The monitoring amplifiers normally bridge the program amplifier outputs. If it is desired to add voice-over on a prerecorded voice or music track, the monitor amplifier is switched to either of the high-level inputs, ahead of the mixers to prevent acoustic feedback.

**STEREO BALANCING:** The M-6642 is provided with circuitry to allow accurate stereo channel balancing using the "null" method with the aid of the large, 4-inch console VU meters.

**INPUTS:** Professional in every respect, the console has transformer-balanced inputs on each channel. Inputs include: six microphones into two faders, and ten turntable, cartridge or reel-to-reel recorders into two faders, (for each stereo channel).

**OUTPUTS:** The Stereo Producer provides high-gain program amplifiers which furnish 600-ohm balanced outputs at +8 VU, after an isolation pad. The monitor amplifiers provide +32 dBm (1½ watts) for driving monitoring loudspeakers. Monitor-speaker muting on the microphone channels is standard.

## SPECIFICATIONS

**MIXING CHANNELS:** Total of 4. 2 microphone channels, 2 medium level (TT/Tape/Projector) channels. Cue provision on medium level channels.

**AMPLIFIER SYSTEM:** 2 identical printed-circuit board assemblies are used, 1 for each stereo channel. Each printed-circuit board contains 2 microphone preamps, 1 booster amp, 1 program amp, 1 monitor amp, and 1 power supply.

**OPERATING MODE:** Stereophonic.

**INPUT CIRCUITS:** 6 microphone or low-level, 10 medium level per stereo channel.

**OUTPUT LINES:** Stereo program line, stereo monitor output, and stereo high impedance headphone jack.

**IMPEDANCES (All Balanced):** Microphone, 30/50 or 150/250 ohms. Medium level, 150/600 ohms. Program output, 150/600 ohms. Monitor outputs, 8/16 ohms.

**GAIN:** Microphone input to line output, 100 dB  $\pm$ 3 dB.  
Medium level input to line output, 55 dB  $\pm$ 3 dB.  
Medium level input to monitor output, 80 dB  $\pm$ 3 dB.

**RESPONSE:**  $\pm$ 1.0 dB from 30 to 15,000 Hz in program circuits.  
 $\pm$ 1.5 dB from 30 to 15,000 Hz in monitoring circuits.

**DISTORTION:** Harmonic, 1.0% maximum, 50 to 15,000 Hz @ +18 dBm output in program circuits, and @ +32 dBm in monitor circuits. Intermodulation, 1.0% maximum in program circuits.

**NOISE:** -120 dBm relative input noise on microphone channels. -75 dBm relative input noise on medium level channels.

**CROSSTALK:** 55 dB below -60 dBm input and +8 dBm output, 30 Hz to 15,000 Hz, microphone channels. 55 dB below -15 dBm input, +8 dBm output, 30 Hz to 15,000 Hz, medium level channels.

**POWER:** 117 volts, 50/60 Hz, power consumption 28 watts.

**FINISH:** Beige/gray with black trim.

**SIZE:** 28" long, 10 1/2" high, 18" deep.

**WEIGHT:** 60 lbs.

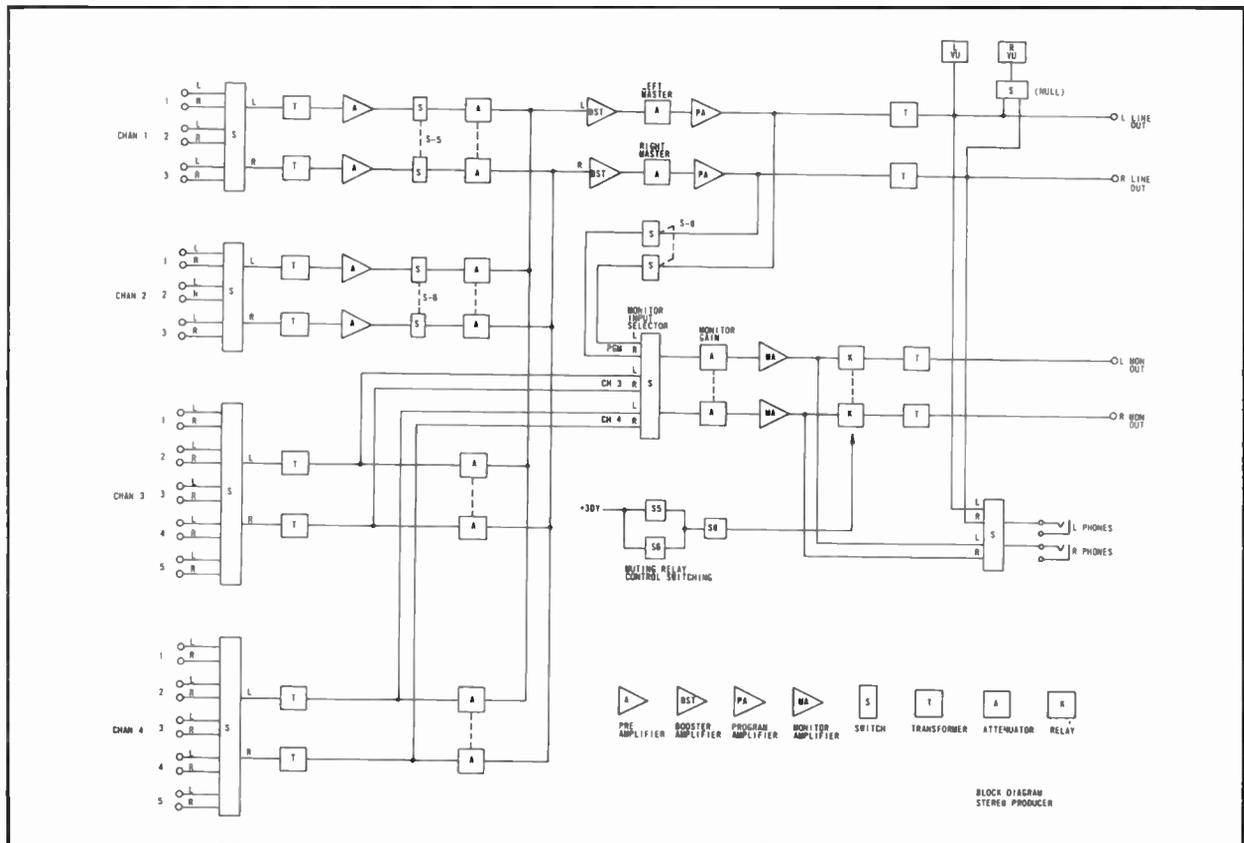
**SHIPPING DATA:** Packed weight, domestic, 75 lbs.; export, 125 lbs., cubage, 5 cubic feet.

## ORDERING INFORMATION

The M-6642 Stereo Producer recording mixer, four channels complete with preamplifiers, program amplifiers, monitor amplifiers and self-contained power supplies .... 994-6642-001

100% spare semi-conductor kit for the Stereo Producer ..... 990-0S83-001

Speaker matching transformers for using external 8-ohm speakers, 48/8 ohms (two required for stereo) .. 478-0291-000



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World Radio History

FOUR CHANNEL RECORDING MIXER

*The*  
**PRODUCER**



The rapid growth of cartridge tape recorders and increased use of reel to reel recorders in radio and television broadcasting demanded an audio control system specifically designed for basic production mixing. Completely transistorized, the Gates Producer provides the facilities for: direct recording; dubbing; sound on sound recording; editing and monitoring. Also, the use of the VA mixing control knob, the same as used on all Gates Solid-Statesman Consoles, adds to the accuracy and speed called for in the handling of a production operation.

**ADAPTABILITY:** Though designed primarily for recording, the engineer will quickly note the Producer's adaptability to other services not requiring a complete speech input console. For instance, the Producer has ample facilities for such services as news rooms, mobile units and small sub-studios.

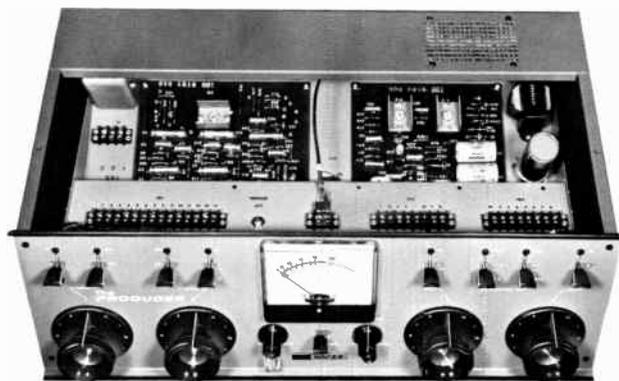
**INPUTS:** Professional in every respect, the Producer provides transformer balanced inputs on each channel. Twelve inputs through the four mixing channels provide: Six microphones into two faders plus six turntables, cartridges, or reel to reel recorders into two faders. Two-stage, 45 dB preamplifiers on microphone channels 1 and 2, provide high level mixing. Completely self-contained, the Producer also includes a high gain program amplifier which furnishes a 600 ohm balanced output at +8 VU, after a 6 dB pad. A high fidelity monitor amplifier is provided, driving the 3" x 5" loudspeaker mounted internally, or an external speaker if desired.

Monitor speaker muting on the microphone channels is standard, as well as muting defeat.

**SOUND-ON-SOUND:** An exclusive feature in the Producer is the ability to make "sound-on-sound" recordings with ease. The monitoring amplifier normally bridges the program amplifier output. If it is desired to add voice over a pre-recorded voice or music track, this amplifier is switched to monitor either high level input, ahead of the mixers, and without fear of feedback.

# The PRODUCER

The Producer is a fine example of functional design and versatility, tailored specifically for broadcast production requirements. All amplifier components are on two printed boards, one containing the two microphone preamplifiers and program amplifier, the other with the monitor amplifier and power supply. All transistors are plug-in for ease of maintenance. The regulated power supply is short-circuit protected by a self-restoring sealed circuit breaker, eliminating the need for fuses. Installation of the Producer is fast and simple, with all cable connections made to barrier-type terminal strips.



Note complete transistorized construction and immediate access to all components. Self-contained 3" x 5" speaker located at top rear is excellent for cueing and production.

## SPECIFICATIONS

### MIXING CHANNELS:

Total four. Two microphone channels, two TT/tape/projector channels. Cue provision on high level channels, by monitor input switching.

### AMPLIFIERS PROVIDED:

One program, two preamplifiers, one monitor amplifier and power supply.

### INPUT CIRCUITS:

Six microphone or low level, six turntables/tape or high level.

### OUTPUT LINES:

600 ohms balanced. One, 45/48 ohm internal or external loudspeaker. One, high-impedance headphone monitor.

### GAIN:

Microphone input to line output, 100 dB  $\pm$  3 dB; turntable input to line output, 55 dB  $\pm$  3 dB; microphone input to speaker output, 125 dB  $\pm$  3 dB; turntable input to speaker output, 80 dB  $\pm$  3 dB.

### FREQUENCY RESPONSE:

$\pm$ 1.0 dB from 30 to 15,000 Hz in program circuits.  
 $\pm$ 1.5 dB from 30 to 15,000 Hz in monitoring circuits.

### HARMONIC DISTORTION:

0.5% maximum, 30 to 15,000 Hz at + 8 dBm. output in program circuits.

### NOISE:

-120 dBm relative input noise on microphone channels.  
 -75 dBm relative input noise on turntable channels.

### POWER:

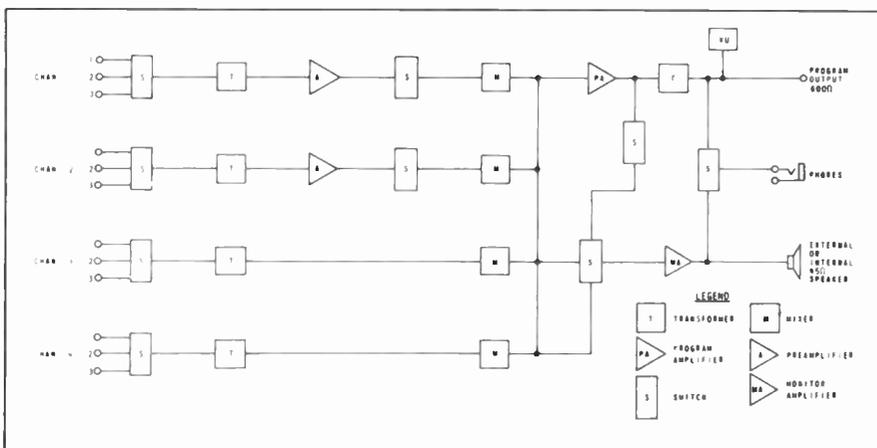
117 volts, 50/60 Hertz, power consumption 30 watts.

### CABINET DATA:

Size: 24" long, 10½" high, 15" deep.  
 Finish: Beige Gray with black trim.

### SHIPPING DATA:

Packed weight, domestic, 50 lbs.; export, 80 lbs. Cubage: 4.6.



## ORDERING INFORMATION

The Producer, recording mixer, 4 channels, complete with 2 preamplifiers, 1 program amplifier, 1 monitor amplifier, and power supply self-contained ..... 994-6407

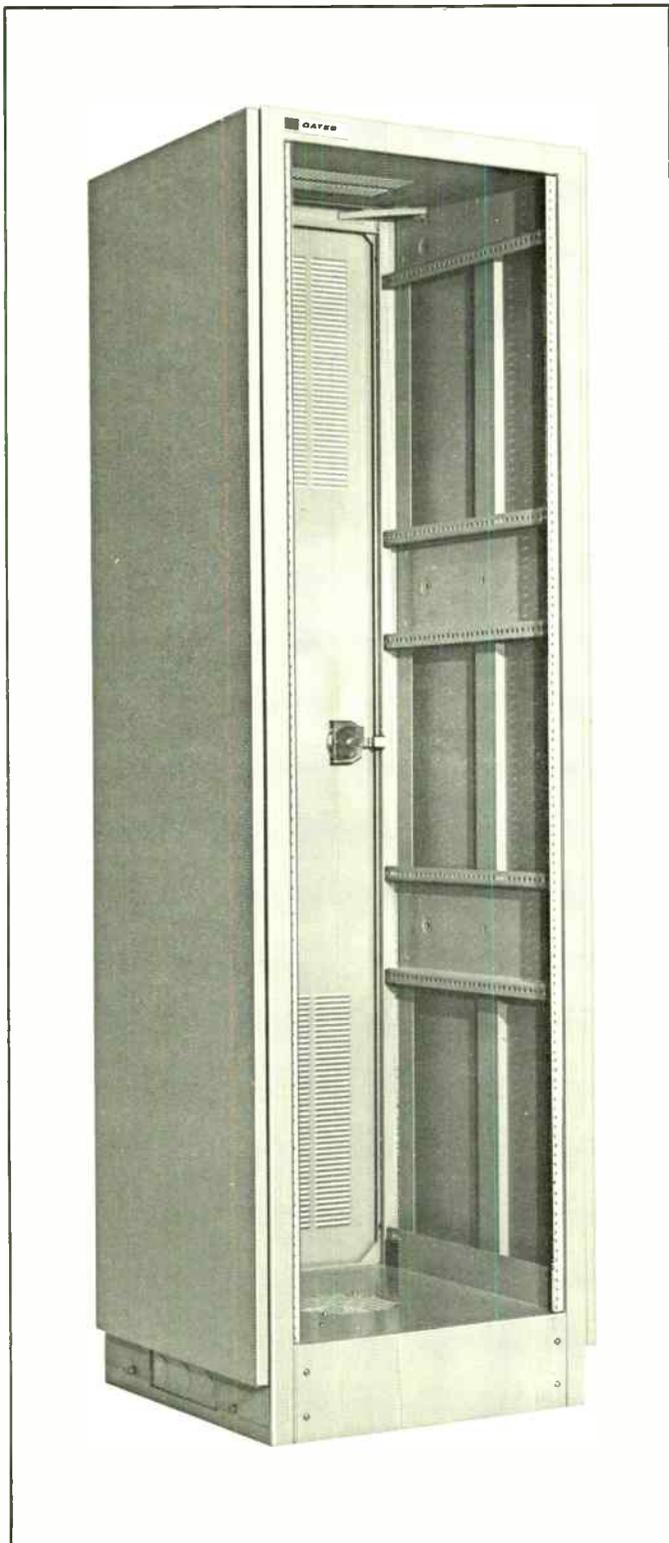
Speaker matching transformer, for using external 8 ohm speaker, 45:8 ohms ..... 478-0275

100% spare semi-conductor kit for The Producer ..... 990-0512



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## RAK-70 RACK-TYPE CABINET



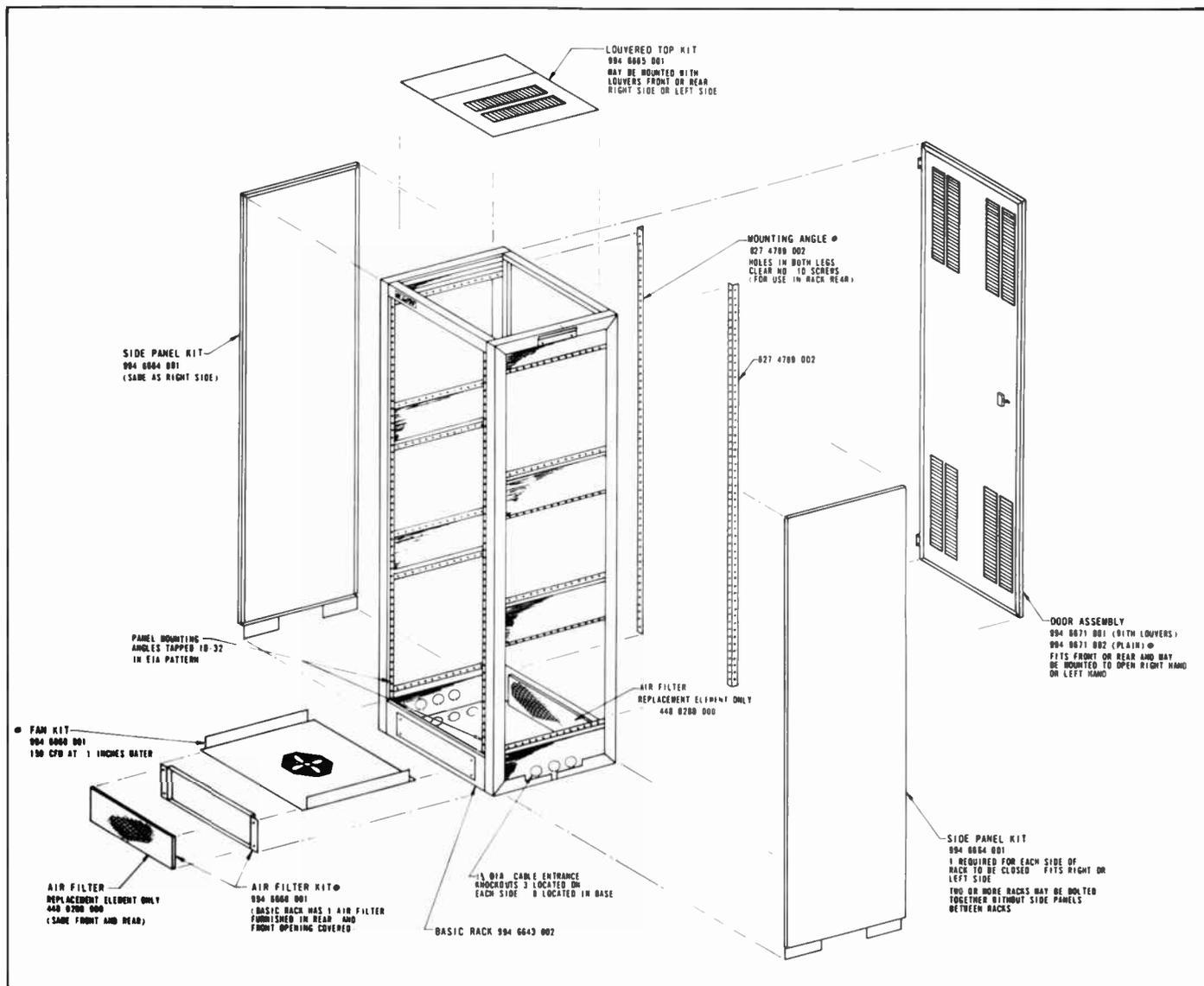
The RAK-70 is designed for the ultimate in flexibility to accommodate all types of equipment. Whether used as a rack alone or a complete cabinet with all accessories, it can fill almost any special requirement of the individual broadcaster.

Mechanical construction of each component gives the RAK-70 a ruggedness and rigidity that cannot be surpassed. There is not the slightest torsion in the doors or cabinet framework. The weight of RAK-70 does not exceed 160 lbs.

Here are just a few features that make the RAK-70 a top-grade high-quality product:

- Air filters that mount in the rear of the cabinet base, with provision for mounting an air filter in the base front.
- A 200-cfm, base-mounted fan will maintain a constant positive pressure inside the cabinet.
- Convenient knock-outs for wiring are located in the bottom and sides of the base.
- New EIA standard panel-mounting hole spacing.
- The rear door is easily removable and can be hinged on the left or right side.
- A recessed twist-type handle with provision for adding a lock.
- Two angle-mounts are available for supporting equipment at the rear of the cabinet.

Optional accessories for the RAK-70 are: fan kit, air-filter kit, rear-door lock, solid (un-louvered) door, and two mounting angles for use in the cabinet rear.



## SPECIFICATIONS

**HEIGHT OVER-ALL:** ..... 78"

**WIDTH OVER-ALL:** ..... 23 1/2"

**DEPTH OVER-ALL:** ..... 23 5/16"

**PANEL SPACE:** ..... 19" x 70"

**PANEL MOUNTING:** New standard EIA rack multiples, 10-32 mounting screws provided.

**FINISH:** Beige-gray, smooth finish.

**WEIGHT:** Net 160 lbs.; Domestic packed, 175 lbs.; Export packed, 275 lbs.; Cubage, 28 cu. ft.

**TO ORDER:** See ordering information at right.

## ORDERING INFORMATION

**Rak-70 Basic Rack** ..... 994-6643-002

**Side Panel** ..... 994-6664-001

**Louvered Top** ..... 994-6665-001

**Door with Louvers** ..... 994-6671-001

**Door without Louvers** ..... 994-6671-002

**Fan Kit** ..... 994-6666-001

**Air Filter Kit** ..... 994-6668-001

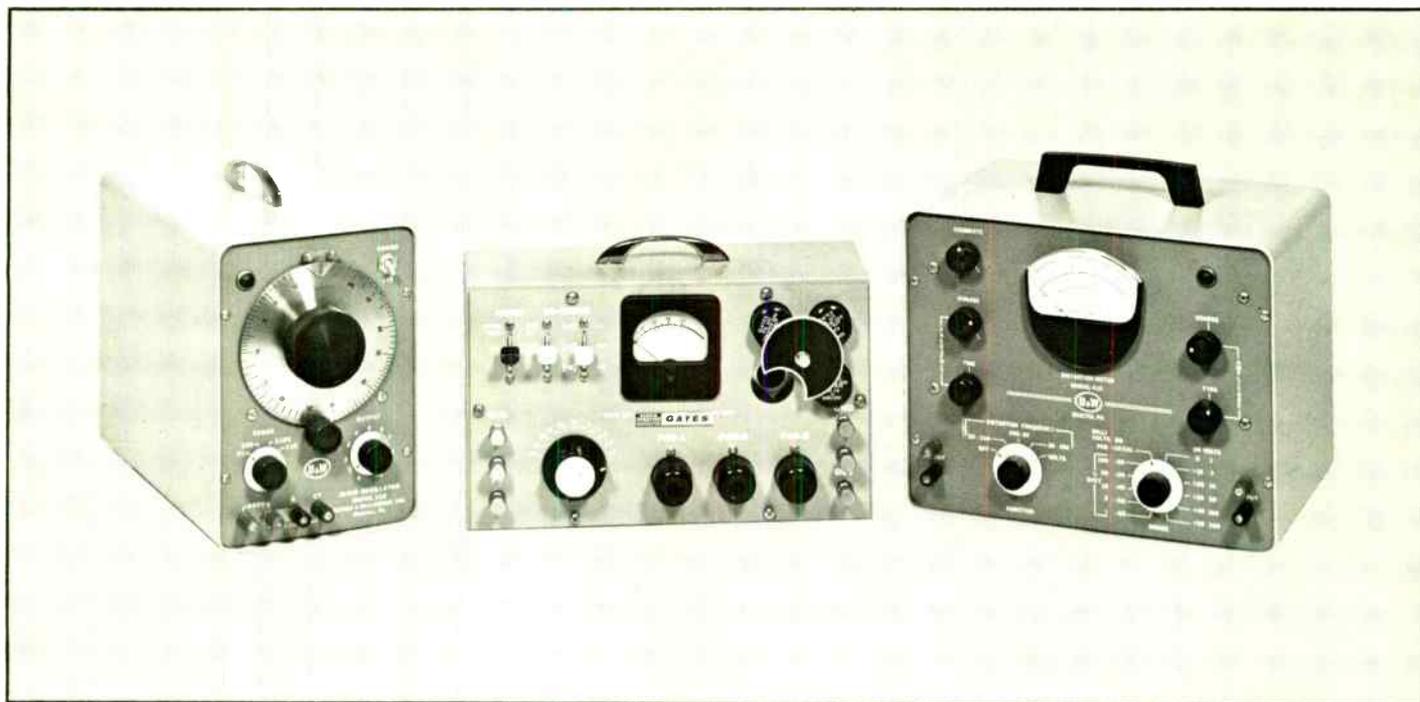
**Air Filter** ..... 448-0288-000

**Rear Mounting Angle** ..... 827-4789-002  
(two must be ordered)



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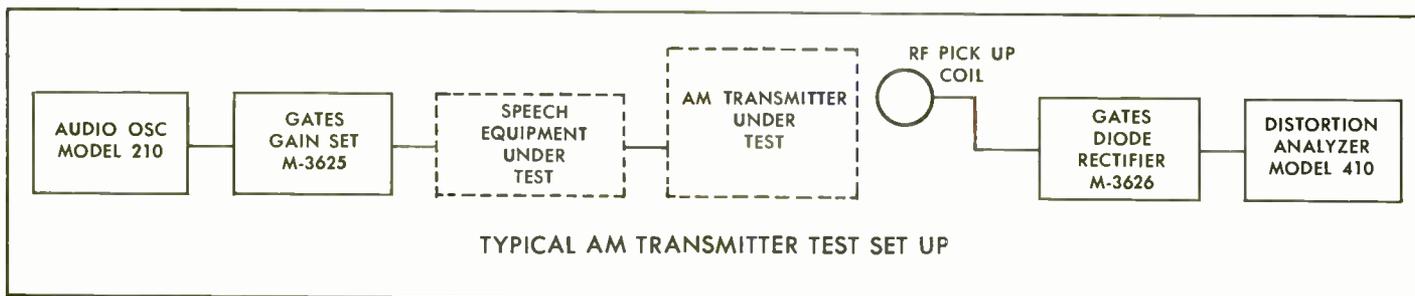
PROOF OF PERFORMANCE PACKAGE TYPE SA-131



A complete proof of performance package is available to broadcasting stations in a form that assures accurate results and complete equipment to check audio and radio frequency performance. There are five basic units, (A) type 210 audio oscillator, (B) M-3625 gain set, (C) type 410 distortion meter, (D) optional RF pickup coil is available for AM transmitter measurements, and it is used with (E) the M-3626-002 Diode rectifier for AM transmitter measurements in conjunction with the noise and distortion equipment. For FM transmitters the signal can be obtained directly from the modulation monitor for proof of performance tests.

FCC regulations require that official measurements of station performance be recorded for inspection at least once a year. The SA-131 Proof of Performance package has all of the equipment required to perform these tests in accordance with FCC rules.

This package will measure accurately from low level microphone circuits or high level input circuits. The block diagram illustrates a typical AM transmitter test set up. The package is designed for testing a single amplifier as conveniently as it can test a complete studio transmitter installation. Complete instructions are supplied with each equipment.





**M-3625 GAIN SET**



**TYPE 410 DISTORTION METER**



**TYPE 210 OSCILLATOR**

**GAIN SET—M-3625** The gain measuring set consists of a VU meter with switching to accommodate all usable ranges for measuring purposes. The attenuation circuit includes a 10 step 2 dB per step variable attenuator of the balanced ladder type, and fixed plug-in pads which may be used in any number from 1 to 3. These pads are used for both attenuation and impedance matching. Two are supplied, providing 40 dB attenuation at 600/600 ohms and one with 20 dB at 600/250 ohms, all balanced H. Additional pads of any desired loss or impedance are obtainable on special order, but are not considered necessary for standard proof of performance measurements.

The gain set is completely shielded, and it may be operated in the RF Field of a radio transmitter.

**SPECIFICATIONS**

- INPUT IMPEDANCE:** 600 ohms, balanced.
- OUTPUT IMPEDANCE:** Variable 30 to 600 ohms.
- OUTPUT LEVEL:** Variable from +21 dBm to -136 dBm.
- RESPONSE:** ±0.5 dB, 30-15,000 Hz.
- DISTORTION AND NOISE:** Negligible.
- SIZE:** 12¾" wide, 8¾" high, 4" deep.

**TYPE 410 DISTORTION METER**—The type 410 distortion meter measures audio distortion, noise level, audio gain or loss in decibels and AC voltages. This unit measures distortion on fundamental frequencies from 20 to 20,000 Hz and indicates harmonics up to 100 kHz. Distortion levels as low as 0.1% can be measured, and distortion measurements may be made on signal levels from 0.1 volt to 30 volts.

For noise and response measurements, the instrument is calibrated in 1 dB steps from 0 to -15 dB. The attenuator provides additional ranges from -60 dB to +50 dB in 10 dB steps. The unit is 11¼" wide, 9" high, and weighs 11 pounds.

**TYPE 210 AUDIO OSCILLATOR**—An excellent source for audio signals from 10 to 100,000 Hz, the type 210 oscillator consists of our RC audio circuit followed by an amplifier of extremely low distortion. Response over the entire frequency range is ±1 dB with wave form distortion of less than 0.2% at a 5 volt output. Calibration over the 10 to 100,000 Hz range is ±2%. Output impedances are 600 ohms balanced, 600 ohms unbalanced and 150 ohms unbalanced. Maximum output is 10 volts into a 600 ohm load. The unit is 6" wide, 9" high, and 12" deep including a self-contained power supply. Weight is 11 pounds.

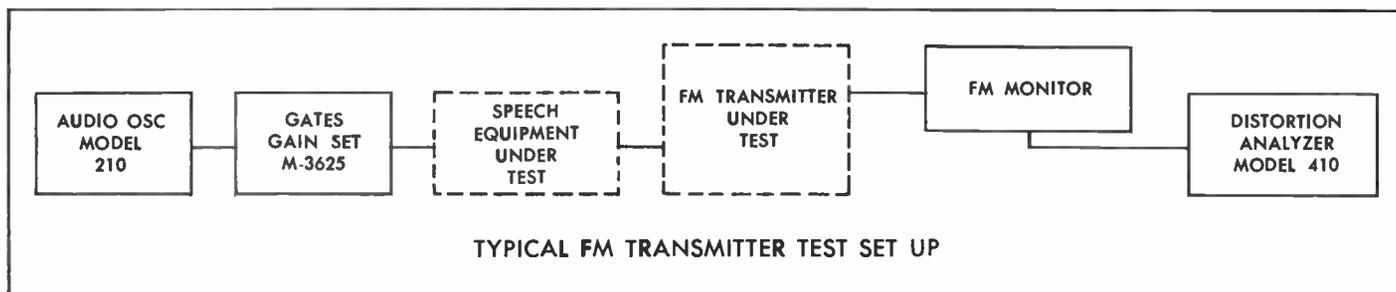
**M-3626-002 RECTIFIER AND PICKUP COIL**—(Optional Accessory AM transmitters only) Designed for use with the type 410 distortion meter, the pickup coil is supplied ready to couple to the tank circuit of an AM transmitter. It is supplied with 15 feet of coaxial cable that connects the coil to the diode rectifier unit. Complete RF filtering guarantees a pure audio output signal free from RF disturbances.

**SPECIFICATIONS**

- FREQUENCY RANGE:** 550 to 2,000 kHz.
- RESPONSE:** ±1 dB, 30 to 15,000 Hz.
- OUTPUT IMPEDANCE:** 600 ohms, unbalanced.
- OUTPUT LEVEL:** +12 dBm.
- NOISE AND DISTORTION:** Negligible.
- SIZE:** 4" long, 2" wide, and 1¼" high.

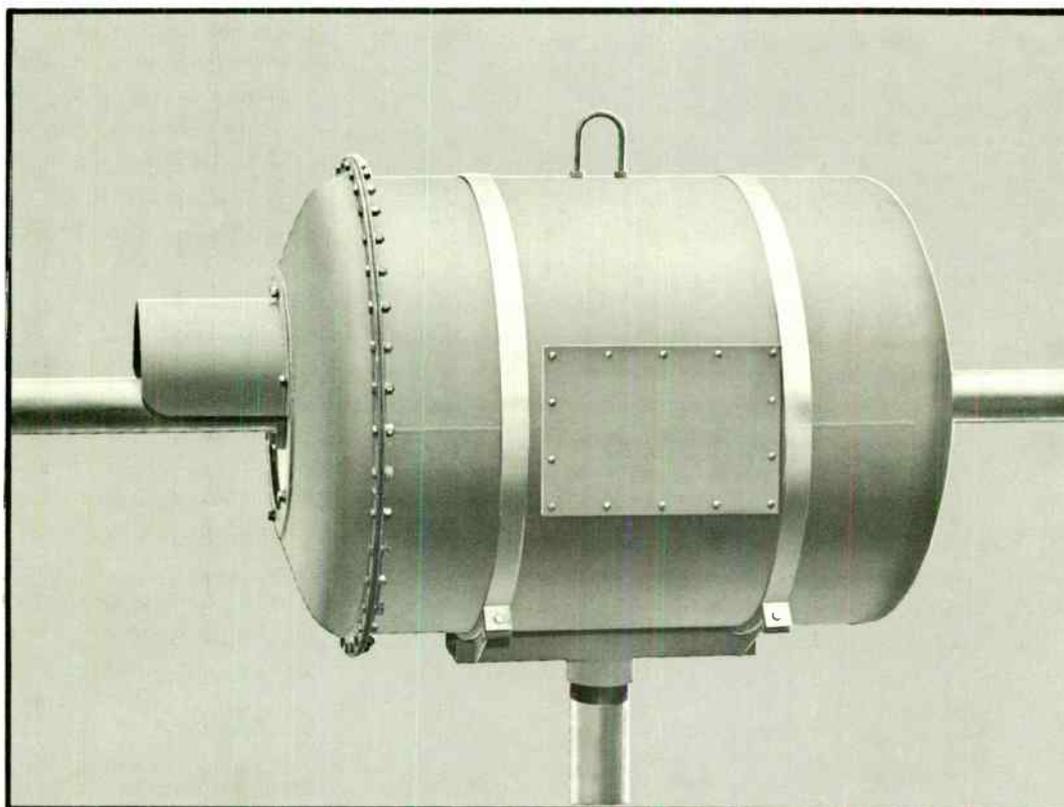
**ORDERING INFORMATION**

Complete Proof of Performance Package, consists of one each  
 Model 210, M-3625, Model 410 ..... SA-131  
 Audio Oscillator ..... Model 210  
 Gain Set ..... M-3625  
 Distortion Meter ..... Model 410  
 Pickup Coil and Rectifier (Optional for AM only) ..... M-3626-002



**TYPICAL FM TRANSMITTER TEST SET UP**

25 kW FM ISOLATION TRANSFORMER TYPE 425



FM isolation transformer is designed to couple FM transmitter power across the base of an insulated tower used jointly as an AM and FM radiator, without objectionable mismatch being introduced into the FM transmission line. Single AM antennas and antennas which are part of an AM directional antenna system are not affected when the isolation transformer is used.

The transformer can be mounted at the base of the tower or directly on the tower structure. Full lightning protection is achieved by heavy duty D.C. shorts between the inner and outer conductors on both ends of the transformer. Discharge of lightning is then through the external gap across the tower base.

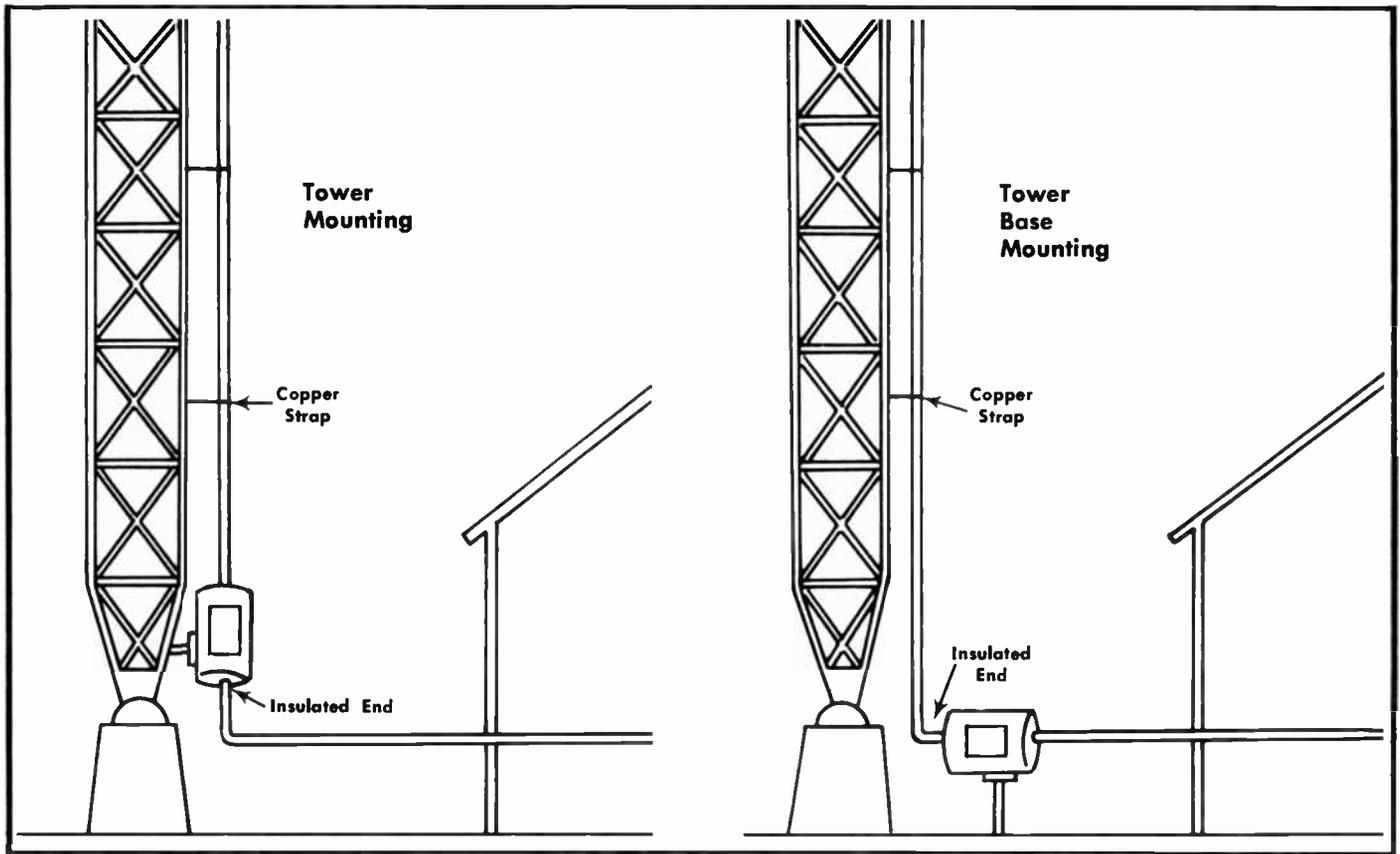
Each isolation transformer is factory tuned to specified frequency. Factory tuning should introduce less than a 1.05 to 1 VSWR at the specified FM frequency,  $\pm 0.5$  MHz, when terminated in a matched 50 ohm load.

The isolation transformer is supplied with EIA  $3\frac{1}{8}$ " 50 ohm male flanges with captive bullets for mating with  $3\frac{1}{8}$ " EIA 50 ohm female flanges on either  $3\frac{1}{8}$ " helical or rigid coaxial transmission line.

Designed for pressurized operation the FM isolation transformer requires a pressure of approximately 3 to 5 lbs./sq. in. Dry air or dry gas should be passed through the unit so that under pressure, changes in temperature will not cause moisture condensation from outside air.

**EQUIPMENT FURNISHED:**

- (1) Isolation Transformer, Type 425
- (1) Mounting Cradle
- (2) "O" Ring for  $3\frac{1}{8}$ " line
- (12)  $\frac{3}{8}$ " x 18" x  $1\frac{1}{4}$ " Bronze Bolt
- (12)  $\frac{3}{8}$ " Bronze lock washer



## SPECIFICATIONS

### ELECTRICAL

#### FREQUENCY:

88 to 108 MHz (tuned to specified frequency).

#### VSWR:

Less than 1.05 to 1 on specified frequency  $\pm 0.5$  MHz when terminated in a matched 50 ohm load.

#### BANDWIDTH:

Over 2 MHz between 1.1 to 1 VSWR points terminated in a matched 50 ohm load.

#### POWER RATING:

25 kW maximum in a matched 50 ohm load.

#### INSERTION LOSS:

0.10 dB or less.

#### AM SHUNT CAPACITY TO GROUND:

60 to 70 PF.

#### LEAKAGE ISOLATION:

At least 30 dB down at the FM frequency (as measured between the outside of the coaxial output line and the case).

### MECHANICAL

#### INPUT & OUTPUT:

$3\frac{1}{8}$ "—50 ohm EIA male flange will mate with the  $3\frac{1}{8}$ " EIA 50 ohm female flange such as the Andrew type 78-AR-F used on  $3\frac{1}{8}$ " Heliac cable, or the flange on Andrew type 562A 50 ohm  $3\frac{1}{8}$ " Rigid Coaxial transmission line.

#### WEIGHT OF TRANSFORMER:

255 lbs.

#### LENGTH:

39" (flange to flange).

#### TANK DIAMETER:

$28\frac{1}{2}$ ".

#### MOUNTING:

Separate 3" pipe flange on bottom. Two stainless steel straps secure tank to cradle.

#### PRESSURIZATION:

Use in a pressure system with gas passing through the unit. (Normal pressure 3 to 5 lbs./sq. in. using dry air or dry gas).

## ORDERING INFORMATION

Isolation transformer 25 kW, standard EIA  $3\frac{1}{8}$ " flanges, adjusted to customer's operating frequency, for use with a maximum transmitter power of 25 kW ..... 620-0444-000



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**PRODUCT  
INFORMATION  
BULLETIN**



**CB - 77  
12 - INCH  
TRANSCRIPTION  
TURNTABLE  
AND  
ACCESSORIES**

Gates' CB-77 is a 12-inch professional transcription turntable with many unique design principles to provide outstanding sound reproduction and years of dependable service. These features include an exclusive inner hub drive that holds rumble to a minimum, and a heavy-duty hysteresis synchronous motor for firm, uniform drive

and good torque for quick starting. Other features include: heavy machined aluminum platter; functional 3-speed selector switch; no belts or gear trains to wear.

The chassis is ready for you to attach the pick-up arm of your choice. See reverse side for turntable systems.

**SPECIFICATIONS**

**CHASSIS SIZE:** 16" x 16" x 1 $\frac{5}{16}$ ". Motor hang below bottom of chassis: 5 $\frac{3}{4}$ ".

**CONSTRUCTION:** Platter and base of machined aluminum.

**FINISH:** Beige-gray with escutcheon in black and turntable platter cover in heavy gray felt.

**PLATTER SIZE:** 13 $\frac{3}{8}$ ".

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

**CENTER SPINDLE:** Spring-locking type snaps up for 45 rpm, locks down for smaller spindle records.

**MOTOR:** Hysteresis synchronous, single phase, 600 rpm, with 40°C temperature rise.

**CUEING:** At 33 $\frac{1}{3}$  rpm,  $\frac{1}{2}$  turn. At 45 rpm,  $\frac{1}{4}$  turn. At 78 rpm, 1 turn.

**NOISE OR RUMBLE:** At 33 $\frac{1}{3}$  rpm, rated -45 dB. At 45 rpm, rated -40 dB. At 78 rpm, rated -35 dB. (Meets or exceeds NAB specifications for stereophonic reproduction.)

**WOW:** 0.1% maximum, capable .08%.

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

**MOTOR START:** Rocker-type illuminated mercury switch.

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

**SPEED CHANGE:** To 33 $\frac{1}{3}$ , 45 or 78 rpm by single indexed lever control.

**POWER:** 117 volt, 60 Hz, 35 watts. (50 Hz model available, see below.)

**WEIGHT:** Net: 30 lbs. Packed: domestic, 40 lbs.; export, 65 lbs. Cubage: 3.6 cubic feet.

**ORDERING INFORMATION**

CB-77 12-inch transcription turntable, chassis only, 60 Hz ..... 994-5798-005

CB-77A 12-inch transcription turntable, chassis only, 50 Hz ..... 994-5798-006

## 12-INCH SYSTEM COMPONENTS

The following components are recommended to make up your 12-inch turntable system.

### MONOPHONIC SYSTEM

CB-77 turntable, 60 Hz (50 Hz available)..... 994-5798-005  
 Gray 206-S 12" tone arm..... 723-0259  
 or  
 Gray 303 12" Micro-Trak tone arm..... 723-0268  
 Shure M-44-7 stereo dynetic cartridge w/.0007" diamond stylus 723-0236  
 M-6244 equalized turntable preamplifier, transistorized..... 994-6244

NOTE: If Gray 206-SG 12" tone arm is desired (catalog number 723-0250), order General Electric VR-II turn-around cartridge (catalog number 723-0017).

### STEREOPHONIC SYSTEM

CB-77 turntable, 60 Hz (50 Hz available) ..... 994-5798-005  
 Gray 206-S 12-inch tone arm ..... 723-0259  
 or  
 Gray 303 12" Micro-Trak tone arm ..... 723-0268  
 Shure M-44-7 stereo dynetic cartridge w/.0007" diamond stylus 723-0236  
 M-6244 equalized turntable preamplifier, transistorized,  
 (two required) ..... 994-6244

NOTE: To order cabinet, see below.



## DUAL TURNTABLE CABINET

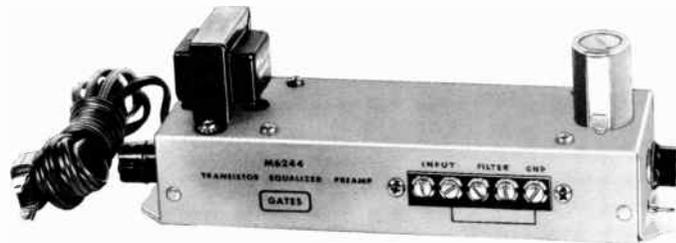
Beautifully styled, and dimensioned to accommodate either 12- or 16-inch Gates turntables.

Dual turntable cabinet..... 994-6449

## SINGLE TURNTABLE CABINET

Fits any decor. Accommodates either 12-inch or 16-inch Gates turntable.

Single turntable cabinet..... 994-6448



## TRANSISTORIZED PREAMPLIFIER

Single-channel preamplifier designed for use in broadcasting, recording, and general sound requirements where low distortion and exacting frequency response characteristics are demanded. Featuring self-contained power supply and transformer output. For stereo operation use two units. The input impedance of 47,000 ohms makes the M-6244 compatible with virtually all magnetic cartridges (including stereo).

## SPECIFICATIONS

**INPUT:** 47,000 ohms.

**OUTPUT:** Adjustable from -22 dBm to -12 dBm with 12 mV input.

**RESPONSE:** Within  $\pm 1$  dB of RIAA/NAB standard curve. Additional high-frequency, roll-off filter position provided.

**DISTORTION:** Less than 0.5% at normal levels (-22 dBm to -12 dBm output). Less than 1.0% at 10 dB overload (above 12 mV input).

**NOISE:** 68 dB or lower, below -12 dBm output (with 12 mV input).

**LOAD IMPEDANCE:** 600 ohms or 150 ohms, balanced or unbalanced.

**MAXIMUM OPERATING AMBIENT TEMPERATURE:** +60°C (+140°F).

**POWER:** 115 volts, 50/60 Hz, 1 watt.

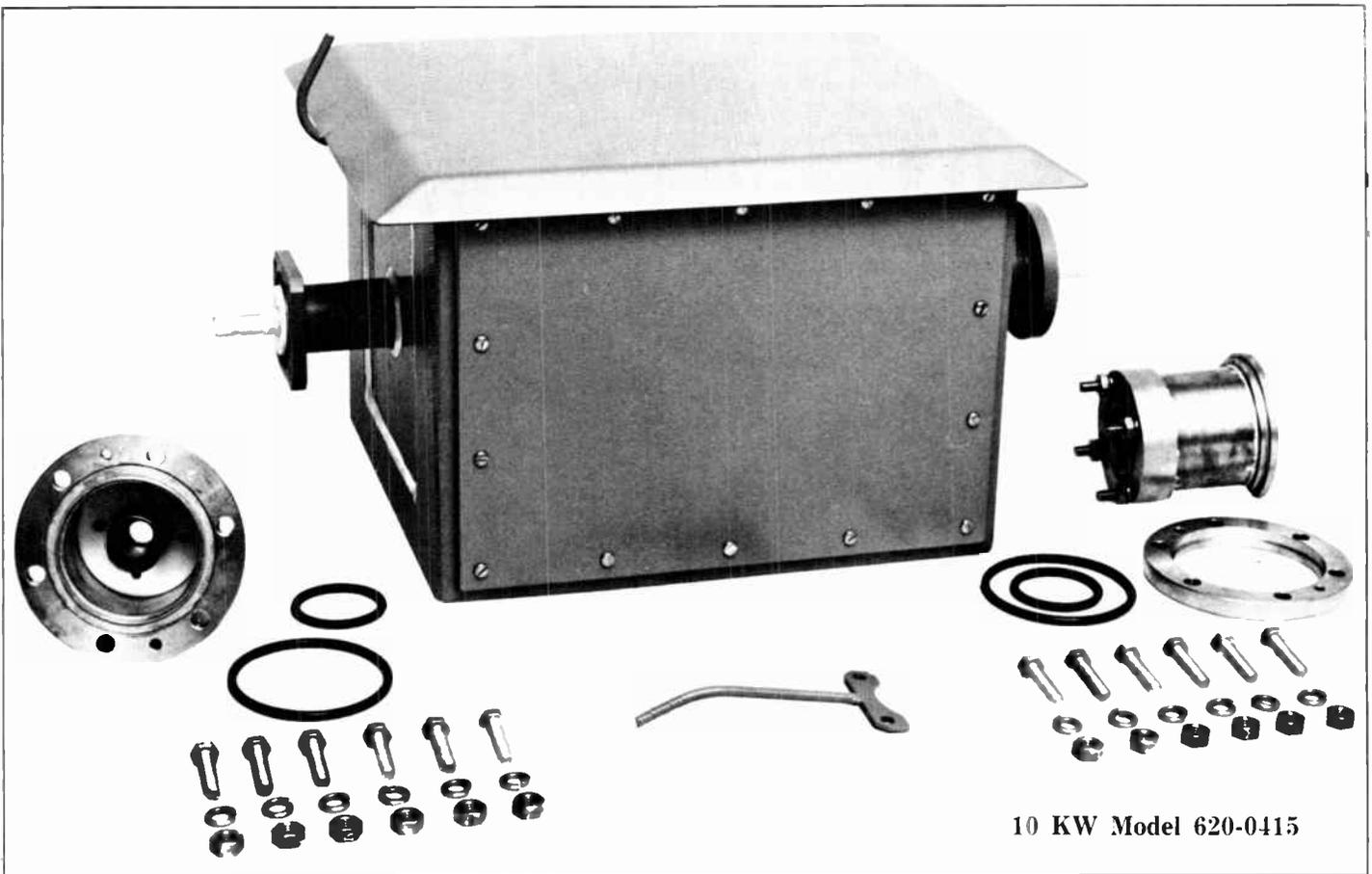
**MOUNTING:** Two holes for mounting to Gates turntable or inside of any cabinet. May be mounted in any position.

**SIZE:** 2 $\frac{3}{16}$ " wide, 8 $\frac{1}{8}$ " long, 2 $\frac{1}{8}$ " high.

**WEIGHT AND CUBAGE:** Net weight, 1 $\frac{1}{4}$  lbs. Packed weight, 8 lbs. Cubage, 1 cubic foot.

Transistor equalized turntable preamplifier (order two for stereo)..... 994-6244





## SPECIFICATIONS

### ELECTRICAL

**FREQUENCY:**

88 to 108 Mc/s - adjusted to the customer's operating frequency at the factory.

**SWR:**

Less than 1.05 to 1 at customer's frequency  $\pm$  0.5 Mc/s when terminated in a matched 50 ohm load.

**POWER RATING INTO MATCHED 50 OHM LOAD:**

10 KW—Model 620-0415.  
7.5 KW—Model 620-0397.

**INPUT:**

EIA 1 $\frac{5}{8}$ " flange male\* or female—620-0397.  
EIA 3 $\frac{1}{4}$ " flange female—620-0415.

**OUTPUT:**

Same as Input.

\*Box has EIA male connector. The male to male adapter may be removed if box connects to female fitting. Subtract 6" from flange to flange length for each adapter if removed.

### MECHANICAL

**WEIGHT:**

48 lbs.

**LENGTH OF BOX:**

17 $\frac{1}{4}$ "

**LENGTH:**

flange to flange 20".

**WIDTH OF BOX:**

13 $\frac{5}{8}$ "

**HEIGHT OF BOX:**

10"

**MOUNTING:**

2" Pipe flange on bottom of box.

**PRESSURIZATION:**

Designed for use in pressurized system—20 lbs./sq. in. max. gas will pass through the unit.

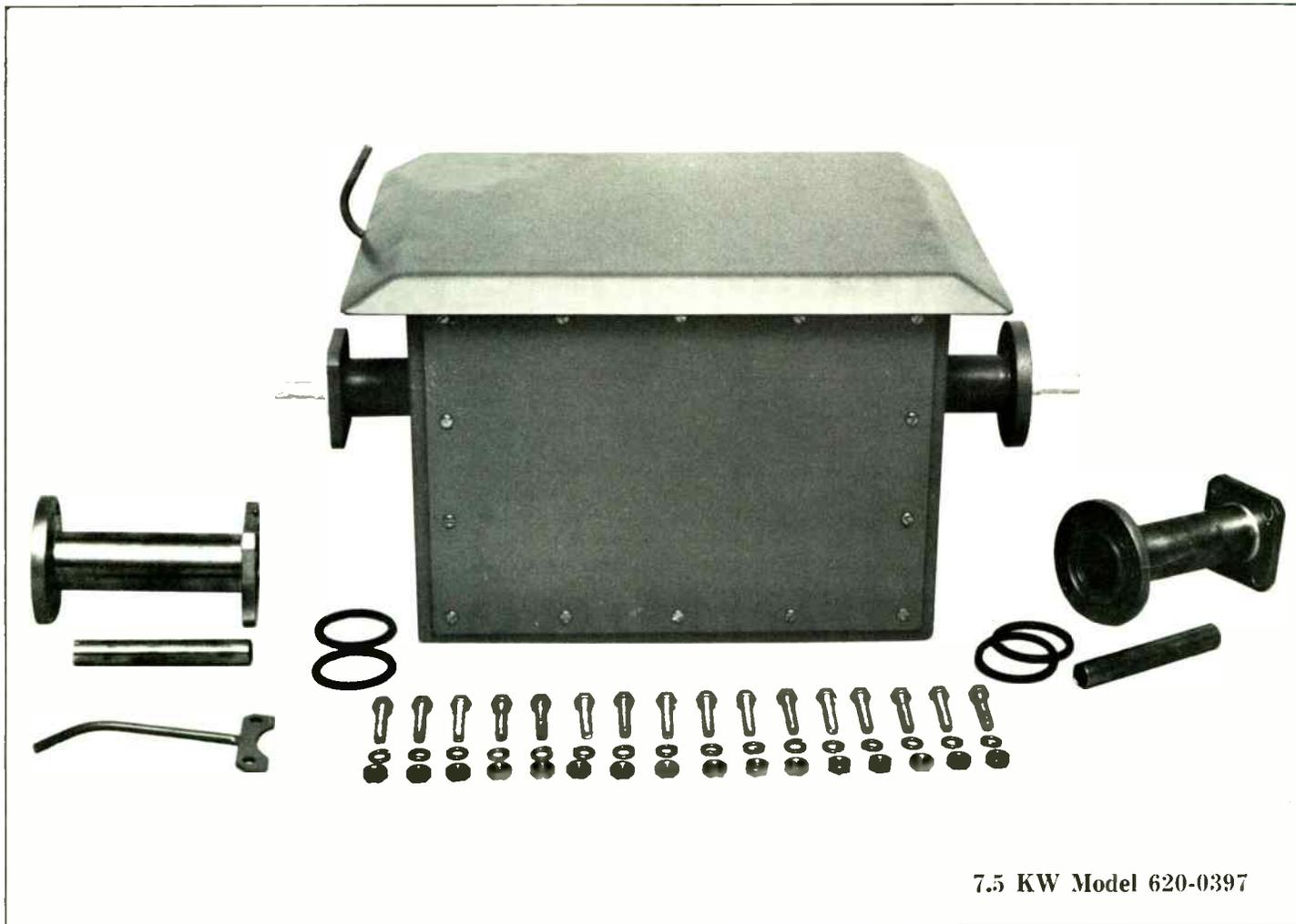
### ORDERING INFORMATION

ISOLATION TRANSFORMER, standard EIA 1 $\frac{5}{8}$ " flanges, adjusted to the customers operating frequency at the factory, for use with a maximum transmitter power of 7.5 kw ..... 620-0397-000

ISOLATION TRANSFORMER, standard EIA 3 $\frac{1}{4}$ " flanges, adjusted to the customers operating frequency, for use with a maximum transmitter power 10 kw. .... 620-0415-000



FM ISOLATION TRANSFORMERS



7.5 KW Model 620-0397

The Isolation Transformer is designed to couple the FM power across the base insulator of a transmitting tower used jointly as an AM and FM radiator without introducing objectionable mismatch into the FM antenna feed line. An isolation transformer is especially desirable for feeding high impedance AM radiators or AM radiators which are part of an AM directional antenna system which might be adversely affected by a "bazooka" isolation system.

**EQUIPMENT FURNISHED**

	7.5 KW	10 KW
	Model	Model
Isolation Transformer .....	1	1
6" male to male adapter .....	2	0
5/16 x 18 x 1 1/2" bronze bolt .....	16	12
5/16 x 18 hex. bronze nut .....	16	12
5/16" bronze lock washer .....	16	12
"O" Rings 1 5/8" .....	4	2
"O" Rings 3 1/8" .....	0	2
3/8" to 1 5/8" Adapters .....	0	2
Horn Gap .....	1	1

**TYPICAL SELECTIONS . . .**

A few of the many variations and combinations possible with Gates modular equipment cabinets are shown below. These examples serve to suggest how a modular system may be assembled to fit specific equipment on operational requirements.

The equipment shown below includes: transistorized Gates ten-channel Diplomat audio console, twelve and sixteen-inch

Gates transcription equipment, and studio accessories. Gates Radio Company also offers the world's most complete selection of standard production audio equipment. A Gates Sales Engineer would be happy to discuss particular programming requirements and recommend a complete control room "package" suited to your individual needs.



1—M-6449 Dual Pedestal  
1—M-6450 Top  
1—M-6456 Double Leg  
1—M-6455 Single Leg



1—M-6449 Dual Pedestal  
1—M-6450 Top  
1—M-6448 Single Pedestal



M-6454 "Combo" Desk Complete:  
2—M-6449 Dual Pedestal  
1—M-6450 Top



M-6449 Double turntable pedestal



M-6448 Single turntable pedestal



**Product Information Bulletin**

**MODULAR CONTROL ROOM EQUIPMENT DESKS**

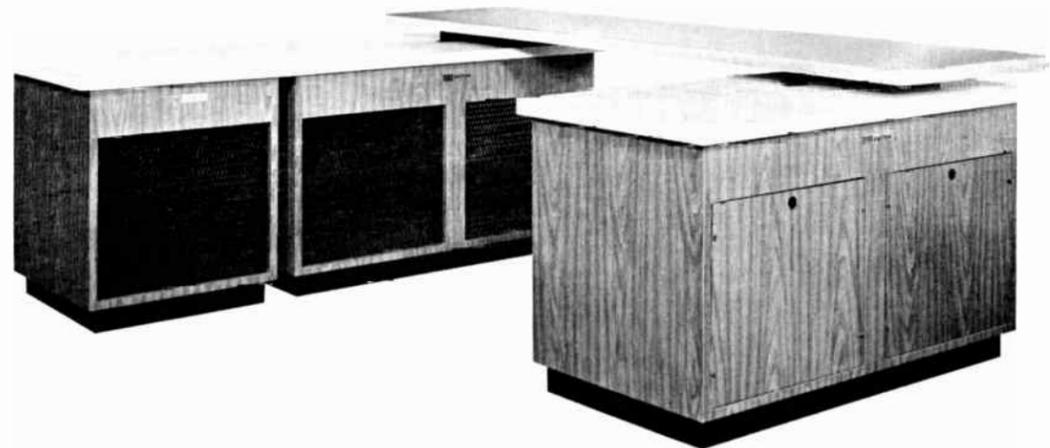


The fullest flexibility of custom cabinetry with the economy of standard production units combine to offer broadcasters a totally new and modern concept in control room desks. Beautifully styled in walnut grain and textured Formica, these desks have the appearance of fine furniture, but with strength and durability to last for years. "Building blocks" of single-width pedestal, double pedestal, uniform top section, plus two decorator leg sections can be assembled in dozens of configurations. Pedestal base sections have removable grill front and cabinet-finish rear doors to reveal standard 19" rack mounting rails. Cartridge tape

equipment, leveling amplifiers, jack fields, etc., may be mounted for operator convenience. The interior of each cabinet is also finished, so cabinets may be used for disc or tape storage, by removing the panels entirely. When used with turntables, the pedestals conform to NAB standards for transcription cabinets. For console wiring, a cable trough is concealed under the top section near the rear. The "horse-shoe" or "combo" configuration shown provides an attractive and functional control center in keeping with the aesthetic beauty of modern communications equipment.



## VARIETY OF COMBINATIONS . . .



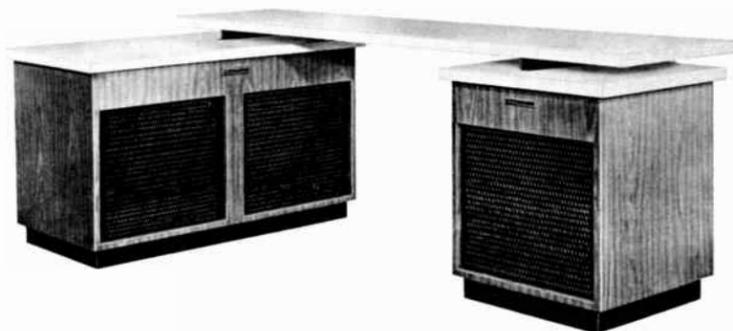
By choosing combinations of modular desk components, large and complex control room arrangements are made possible. Shown at the right is a desk system with one extended "wing". This could easily accommodate an extra turntable, two-way radio, or other miscellaneous control room equipment. Or, the top can be left bare for counter space, with the grilled area used for mounting any rack-mounted equipment such as: remote control, reel-to-reel recorders, utility amplifiers, or any of the sundry equipments used in modern broadcasting.

Development of this tasteful equipment cabinetry encompassed human engineering studies, styling analysis and comparison with established mechanical specifications where available. For instance, the turntable pedestals conform to the height standards of the NAB, and are four inches lower than the desk top section for comfortable operation. Color and texture of the cabinets blend easily with any studio color scheme and provide an "eye-pleasing" setting in keeping with the trend of modern office furniture.



Construction of the M-6450 uniform top section is of durable 3/4" base material, laminated with neutral finish Formica. A steel cable trough runs the length of the top for easy and neat console installations. Steel mounting brackets elevate

the top section, 4 inches from the side pedestals for very modern appearance, yet retaining commercial conservatism. Shown is a single-wing configuration, utilizing a top section, double pedestal and double leg section.



Many interesting variations in control room desks allow "tailor-made" arrangements for specific station operations. The single pedestal, serving as a right-hand desk base, may also provide rack space for cartridge, reel-to-reel recorder or storage. All pedestals have sturdy black steel bases with leveling feet. Each expanded metal grill or finished access

door removes to reveal 16" of standard 19" rack space. Double and single leg assemblies are of sturdy 1" satin chrome square steel tubing with leveling feet. Both 12" and 16" Gates turntables and all types of speech input consoles may be used with these cabinets.

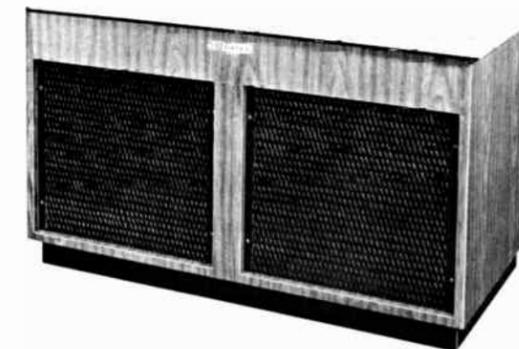
## SPECIFICATIONS



### SINGLE PEDESTAL, M-6448

Mounts one 12" or 16" turntable. 16" rack mount space front with expanded metal grill. 16" rack mount space rear with wood-grain door. Constructed of 3/4" solid flake board, laminated with Formica. Furnished with 2 1/2" steel base and floor levelers.

**FINISH:** Walnut. Top in Champagne and trim in Satin Black.  
**SIZE:** Height 26", width 23", depth 23".  
**WEIGHT:** Net, 60 lbs.; packed 70 lbs.  
**CUBAGE:** 12.



### DOUBLE PEDESTAL, M-6449

Mounts two 12" or 16" turntables. Total 64" of 19" rack mount space available front and back both sections. 3/4" Flake board with Formica laminate. 2 1/2" steel base and floor levelers.

**FINISH:** Walnut. Top in Champagne and trim in Satin Black.  
**SIZE:** Height 26", width 45", depth 23".  
**WEIGHT:** Net, 108 lbs.; packed, 140 lbs.  
**CUBAGE:** 18.

**NOTE:** Cabinets normally supplied less cut-outs for turntables. If cut-outs desired, a slight added cost is involved.

### METAL GRILL REPLACEMENTS

Where the expanded metal grill used on cabinet fronts, such as the M-6448 or M-6449, is to be eliminated in part, for rack mounted items, other size grills are listed below to fill the unused portion. Example, full grill is 16" high. If 5 1/4" rack space used, order M-6453B to fill remaining space.

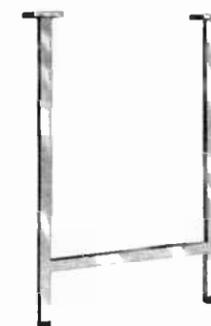
Grill 10 1/2" high ..... M-6453B  
 Grill 5 1/4" high ..... M-6453C  
 Grill 3 1/2" high ..... M-6453D

### UNIFORM TOP SECTION, M-6450

Complete with wiring trough, and angle brackets for assembly with pedestals or legs. When assembled, desk surface is 29" from floor. (Not Illustrated)

**FINISH:** Neutral Champagne Formica.  
**SIZE:** Length 84", depth 29", thickness 1 1/16". (Other lengths on special order).  
**WEIGHT:** Net; 55 lbs; packed, 70 lbs.  
**CUBAGE:** 7.5.

### DOUBLE LEG, M-6456



For supporting top section. Square, 1" steel welded construction with cross-brace. Complete with mounting flanges and floor levelers.

**FINISH:** Satin Chrome Steel.  
**SIZE:** 1" x 1" x 28", over-all width 21".  
**WEIGHT:** Packed, 10 lbs.  
**CUBAGE:** 2.

### SINGLE LEG, M-6455



Mounts beneath desk top section. Square, 1" steel tubing with mounting flange and floor leveler.

**FINISH:** Satin Chrome Steel.  
**SIZE:** 1" x 1" x 28".  
**WEIGHT:** Packed, 5 lbs.  
**CUBAGE:** 1.

## ORDERING INFORMATION

Single Turntable Pedestal, complete ..... M-6448  
 Double Turntable Pedestal, complete ..... M-6449  
 Uniform top section, complete with mounting angles & cable trough ..... M-6450

Single leg assembly ..... M-6455  
 Double leg assembly ..... M-6456  
 Combo desk system, complete with 2 double pedestals and top section ..... M-6454

## REEL-TO-REEL CASSETTES

Any standard reel-to-reel cassette can be used with Gates Broadcast Cassette Recorders; however, a high quality cassette is recommended for best results. These cassettes are available from Gates Radio Company in a variety of sizes:

Cassette Type	Time At 1-7/8 ips With Control Tones	Gates Part No.
GC-30	15 Minutes	732-0268
GC-60	30 Minutes	732-0269
GC-90	45 Minutes	732-0270
GC-120	60 Minutes	732-0271



**HARRIS  
INTERTYPE  
CORPORATION**



**GATES**  
A DIVISION OF HARRIS-INTERTYPE

# BROADCAST TAPE CASSETTE SYSTEM

## SPECIFICATIONS

<b>SPEED:</b> 1-7/8 IPS	<b>OUTPUT:</b> 0 dBm into 600 ohm load at standard record level (12 dB headroom)
<b>START TIME/ STOP TIME:</b> Virtually instantaneous	<b>CONNECTORS:</b> XL
<b>FREQUENCY RESPONSE:</b> 40 Hz to 15,000 Hz, within +2 dB to - 4 dB from a 333 Hz reference.	<b>INPUT:</b> Bridging, from -25 dBm to achieve zero level
<b>SIGNAL-TO-NOISE RATIO:</b> 47 dB below peak program level (1/4 track) with 40-10,000 Hz equalization, 42 dB below peak program level (1/4 track) with 40-15,000 Hz equalization and unweighted noise measurement bandpass.*	<b>POWER:</b> 117 VAC or 230 VAC, 60 Hz (50 Hz special)
<b>DISTORTION:</b> 1-1/2% maximum at 1 kHz at 0 dBm output	<b>DIMENSIONS—RACK MOUNT:</b> Transport (reproducer), 5-1/4 in. by 19 in. by 12 in. Record Amplifier, 3-1/2 in. by 19 in. by 12 in.
<b>FLUTTER AND WOW:</b> Less than 0.2%	<b>DIMENSIONS—DESK MOUNT:</b> Transport (reproducer), 6-1/4 in. by 16-1/2 in. by 12 in. Record Amplifier, 4-1/2 in. by 16-1/2 in. by 12 in.
<b>BIAS:</b> 100 kHz	*Equalization may be field changed by bias adjustment.

## ORDERING INFORMATION

Gates' Broadcast Cassette Playback only. Monaural. Complete with automatic rewind, auto cue, and auxiliary control tone circuits. Rack mount. 60 Hz	730-1413
Gates' Cassette Playback only, as above except 50 Hz.	730-1425
Gates' Cassette Playback only. Stereo. Rack mount. 60 Hz	730-1414
Gates' Cassette Playback only. Stereo. Rack mount. 50 Hz	730-1426
Gates' Broadcast Cassette Record/Playback. Monaural. 60 Hz. Complete matched pair with automatic rewind, auto cue, and auxiliary control tone circuits. Rack mount	730-1415
Gates' Broadcast Cassette Record/Playback. Monaural. As above except 50 Hz.	730-1427
Gates' Cassette Record/Playback. Stereo. Rack mount. 60 Hz	730-1416
Gates' Cassette Record/Playback. Stereo. Rack mount. 50 Hz	730-1428
Desk-mount Cabinet for cassette playback	730-1417
Desk-mount Cabinet for cassette record amplifier (purchase both cabinets for matched pair)	730-1418
Input Transformer (two required for stereo)	478-0320



123 HAMPSHIRE ST. • QUINCY, ILLINOIS • 62301 • U.S.A.

# GATES

## BROADCAST CASSETTE RECORDER/REPRODUCER

Gates professional reel-to-reel Cassette Tape Recorders and Reproducers signify the beginning of a new era of convenience in magnetic recording and playback for the broadcast industry. Combining the best features of conventional reel-to-reel equipment and endless-loop tape cartridges, the Gates Cassette units provide a broadcast quality tape transport that occupies just 5-1/4 inches of rack

space, or sits handsomely and conveniently on the console desk.

Stations now recording news and features on portable consumer-type cassette recorders will find the Gates professional cassette transport ideal for control room use—combining excellent audio quality with the convenience of high speed automatic cueing.



and level controls. All preamplifiers, amplifiers, oscillators and logic modules are solid-state, plug-in boards.

An important feature of the Gates recorder is the ease with which any one of the many events recorded on a cassette can be located, and a new event re-recorded (erasing the original), without affecting the other material recorded on the cassette.

The unique Auto Cue makes all of the convenience features of Gates' Broadcast Cassette possible—by stopping the tape automatically on record or playback at the beginning of each new event on the tape. The automatic cueing pulse is placed on the tape by pushing the Stop button when recording material on the cassette.

The Gates broadcast cassette recorder has a professional three-motor transport . . . with a synchronous capstan drive motor and a solenoid-operated capstan drive assembly, including a cue position for safe monitoring of the tape in the fast forward or rewind modes.

It is simple to control, with illuminated front panel push buttons for Fast Forward, Rewind, Stop, and Play. A socket on the rear chassis is provided for complete remote control.

All pre-amps, amplifiers, oscillators, and logic modules are solid-state, plug-in units. Automatic functions are: automatic rewind at tape end; automatic rewind on auxiliary tone; auxiliary tone control for use with automation systems; and automatic cue to the next event on the tape.



Chassis slides out for easy maintenance.

## THE ADVANTAGES OF THE REEL-TO-REEL CASSETTE

The compact reel-to-reel cassette offers many important features not found in the endless-loop type of tape cartridge.

For commercials, a control tone can automatically cue the cassette to the beginning of the next spot with the very important added advantage of being able to re-record any portion of the tape. An auxiliary tone recorded after the last commercial causes the cassette to automatically rewind and cue to the first commercial in just a few seconds. Rewind time is approximately one second per commercial.

50, 100, or more individual items can be recorded on a single tiny cassette. Any one of them can be located quickly, and changed without affecting the rest of the material recorded on the tape.

## MODELS AND TYPES

Gates professional Broadcast Cassette models are available in Playback Only, or Record/Playback combination models, and in monaural or stereo. The basic rack-mount design may be quickly adapted for desk mounting with the optional desk enclosures. All units are equipped with slide-out chassis for maintenance.

## RECORD AMPLIFIER

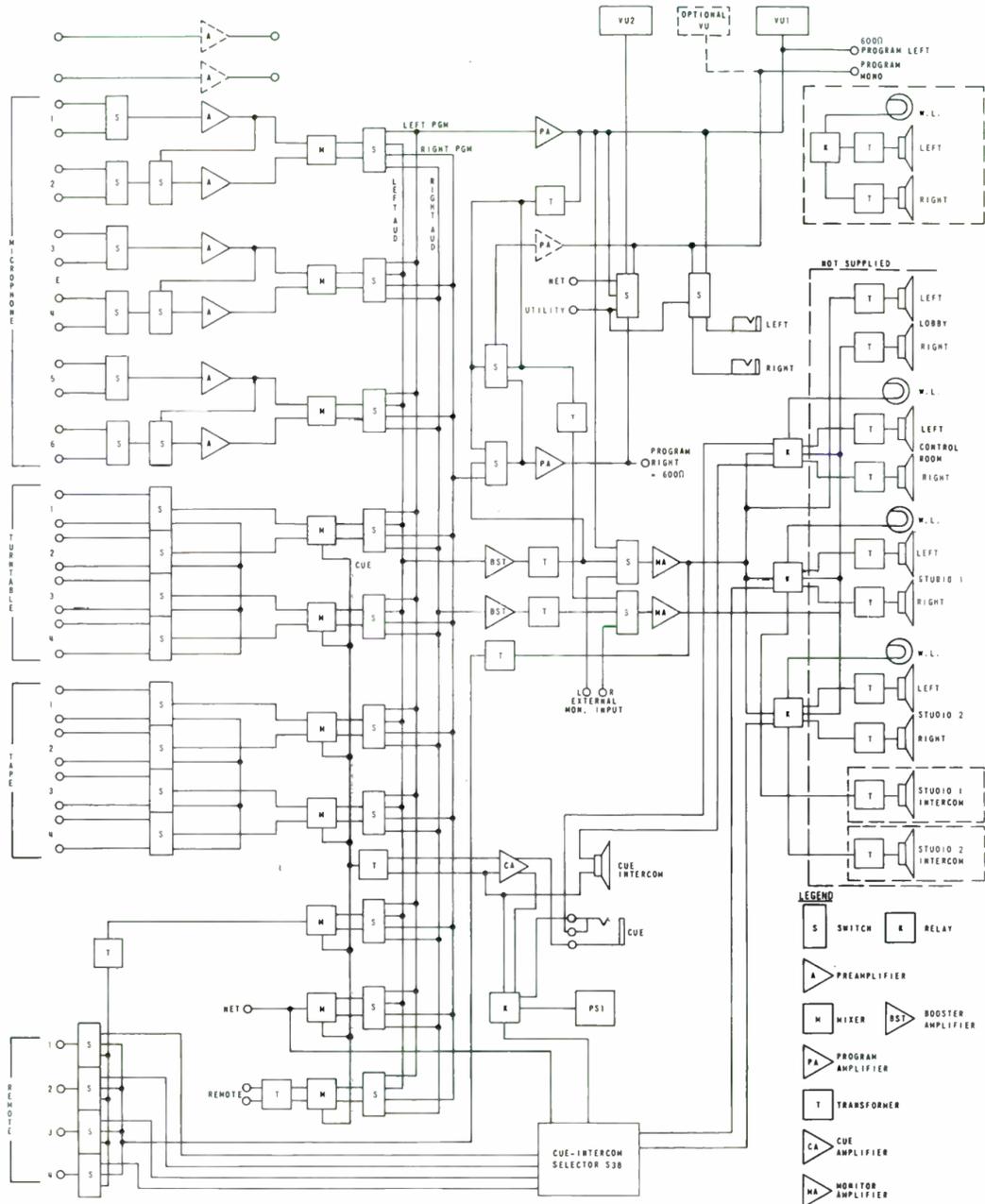
The record amplifier plugs directly into the reproducer. It features illuminated front panel push buttons for Record, Auxiliary Tone, and Stop. Also on the record amplifier are VU meter (two for stereo)

## TRACK CONFIGURATION

Positioning of audio and control tracks on Gates' Broadcast Cassette units is illustrated in the chart at the right. Program channels for mono or stereo are compatible with all standard cassette equipment, with the added advantage of complete mono/stereo track compatibility. Control tones for automatic cueing and auxiliary functions are contained on separate tracks in the four-track format. Automatic erase capability is provided for the two program audio tracks and one auto cue/auxiliary control channel. All Gates Broadcast Cassettes operate in a uni-directional mode.

HEAD CONFIGURATION OF REPRODUCE AND RECORDER MODELS		
	Audio Plus Automatic Cueing And Auxiliary Control Tone	
Mode	Monophonic	Stereo
Reproducer Only Model Number	730-1413	730-1414
Record/Reproducer Model Number	730-1415	730-1416
Program Audio Channels	One	Two
Erase Head	3/4 Track	3/4 Track
TRACK CONFIGURATION	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Control</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Control</div> <div style="border: 1px dashed black; padding: 2px; margin-bottom: 2px;">Audio</div> <div style="border: 1px solid black; padding: 2px;">Audio</div> </div> <p style="text-align: center; margin-top: 5px;">1/4 Track</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Control</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Control</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Audio</div> <div style="border: 1px solid black; padding: 2px;">Audio</div> </div> <p style="text-align: center; margin-top: 5px;">1/4 Track</p>

# The Executive



BLOCK DIAGRAM

## SPECIFICATIONS

### MIXING CHANNELS:

10 Full stereophonic each with stereo low impedance ladder attenuator.

### INPUTS:

12 Stereo microphones to 6 preamps.  
9 Stereo turntables, tape and projector inputs into 5 stereo mixers.  
4 Remotes into 1 stereo mixer.  
1 Individual stereo network channel.  
3 Stereo monitor inputs.

### OUTPUTS:

3 Program lines:  
2 Stereo program lines—simultaneous or stereo.  
1 Monophonic compatible or independent program line.  
8 Stereo muted monitor outputs.  
2 Stereo unmuted monitor outputs.  
4 Stereo recording outputs.  
10 or more Stereo speaker outputs.  
2 Interlocked studio intercom outputs.  
2 Headphone outputs.

### AMPLIFIERS:

10 Plug-in transistor preamplifiers.  
6 microphone preamplifiers.  
2 Optional microphone preamplifiers (where ordered).  
2 Booster amplifiers.  
3 Plug-in transistor program amplifiers.  
2 Program amplifiers feeding stereo/simultaneous outputs.  
1 Optional compatible or independent.  
1 Plug-in transistor cue/intercom amplifier.  
2 Full level transistor monitor amplifiers with ganged level controls.

### POWER SUPPLY:

1 Fully regulated, electronically protected transistor power supply.

### GAIN:

Microphone to program line: 104 db maximum.  
Turntable/tape/projector/remote to program line: 64 db maximum.  
Microphone to speaker output: 106 db.  
Turntable/tape/projector/remote to speaker output: 64 db.

### FREQUENCY RESPONSE:

(Typical)  $\pm 1.5$  db from 20 to 20,000 cps in all regular program circuits.  
 $\pm 1.0$  db from 30 to 15,000 cps in all regular program circuits.  
(Typical)  $\pm 2.0$  db from 20 to 20,000 cps in all monitor speaker circuits.  
 $\pm 1.5$  db from 30 to 15,000 cps in all monitoring speaker circuits.

### HARMONIC DISTORTION:

(Typical) 0.5% Maximum, 20 to 20,000 cps at +8 dbm output in all regular program circuits.  
0.5% maximum, 30 to 15,000 cps at +8 dbm output in all regular program circuits.  
0.5% maximum, 50 to 15,000 cps at +18 dbm output in all regular program circuits.  
(Typical) 1.0% Maximum, 20 to 20,000 cps at +38 dbm in all monitor speaker circuits.  
1.0% maximum, 50 to 15,000 cps at +39 dbm (8 watts) in speaker outputs.

### INTERMODULATION DISTORTION:

(Typical) 0.5% maximum, 20 to 20,000 cps at +8 dbm output in all regular program circuits.  
0.5% maximum, 30 to 15,000 cps at +8 dbm output in all regular program circuits.  
(Typical) 0.5% maximum, 20 to 20,000 cps at +18 dbm output in all regular program circuits.  
0.5% maximum, 30 to 15,000 cps at +18 dbm output in all regular program circuits.  
(Typical) 1.0% maximum, 20 to 20,000 cps at +38 dbm in all monitor speaker circuits.  
1.0% maximum, 50 to 15,000 cps at +39 dbm (8 watts) in all monitor speaker circuits.

### SOURCE IMPEDANCE:

Microphones—30/50 or 150/250 ohms.  
Turntable/tape/projector/remote/network—600 ohms.

### LOAD IMPEDANCE:

All program lines—600 ohms.  
Speaker outputs—4 to 16 ohms.  
Recording outputs—600 ohms.

### NOISE:

—122 dbm equivalent input noise—microphone to program line.

### CROSSTALK:

Below noise level in all channels.

### STEREO ISOLATION:

Below noise level in all channels.

### TRANSISTOR COMPLIMENT:

6 Industrial type totaling 76.

### POWER CONSUMPTION:

Approximately 50 watts at 110/117/125 volts, 50/60 cps.

### SIZE:

53½" long, 11¾" high and 17¾" deep. 107 lbs. net wt.

### FINISH:

Satin anodized black nomenclature on natural anodized aluminum background panels on a medium gray cabinet.

## ORDERING INFORMATION

Executive 10-channel transistor stereo audio control console, complete with 2 monitor amplifiers, 6 preamplifiers, 2 booster amplifiers, cue-intercom amplifier, 2 program amplifiers and power supply . . . **994-6158**  
Optional preamplifier . . . . . **994-6034**  
Optional program amplifier . . . . . **994-5700**  
Speaker matching transformer . . . . . **478-0275**  
Optional 3rd VU meter . . . . . **994-6208**  
Intercom sub-station . . . . . **994-6424**



QUINCY, ILLINOIS 62301 U.S.A.

J&K-1M-1071

ADV. 107A

# EXECUTIVE

## Ten Channel Transistor Audio Control Console

# GATES

HARRIS  
Communication  
Technology



- Provides 10 full stereo mixing channels.
- Completely transistorized, utilizing Gates Solid Statesman transistor amplifiers for superb performance.
- Completely self-contained. (A small primary isolation transformer is the only external item.)
- Provides for mixing, cueing and monitoring of multiple program sources, including microphones, turntables, tape recorders, remote pickups and networks.
- Provisions included for addition of third output program amplifier for compatible AM signal simultaneous with FM stereo program, or to feed a completely different program to AM transmitter and full stereo program to FM transmitter.
- When stereo programs are not broadcast, the two output channels may be used to feed either a monophonic signal to two transmitters simultaneously, or for two completely different programs.
- Microphone switching is arranged so that a single microphone can feed both channels for isolated

- monophonic announcements on stereo. Or, two microphones can be connected into the stereo preamplifiers for full stereo announcements.
- Signal levels are fixed-pad compensated throughout the console to minimize the necessity of readjusting gain controls when switching from one circuit to another.
- Cue-intercom system provides cueing of turntable and tape sources and intercom facilities between control room, each studio and remote lines.
- Stereo monitoring of both the program output and the audition bus is provided, as well as an external stereo monitor input.
- Large "feel-of-the-board" control knobs with prominent index blades used on all input channels.
- The free-floating front panel and "flip-top" lid are hinged to provide full accessibility to internal components.
- Dramatic styling by one of America's foremost industrial designers.



# The Executive

## GENERAL INFORMATION

**Mixing System:** Ten-channel stereo mixer utilizing low impedance ladder type controls in a parallel, minimum loss type, mixing circuit.

**Microphone Channels:** Three microphone channels can be individually switched from the front panel to either full stereo operation or fully isolated monophonic feed from one microphone into the stereo mixer. There are two separate preamplifiers in each of the three microphone channels, operated in parallel for stereo use. The second preamplifier is bridged off the first when a single microphone is used to feed the stereo program, simplifying disk jockey, control room or news room microphone insertions.

Microphone transfer switches are located immediately above the microphone mixing channels for instantaneous changes in programming requirements. A second switch for each microphone channel allows the selection of two sets of stereo microphones into each of the three channels. This permits the use of six sets of stereo microphones without patching.

**Turntable Channels:** Channels 4 and 5 have switching to accommodate four turntables into either channel in any sequence. A cue position on these two channels permits cueing in the channel not in use.

**Tape Channels:** Channels 6 and 7 have switching to accommodate four tape machines into either channel in any sequence. There is a cue position on channels 6 and 7 to permit previewing and cueing of all recorder material before feeding it to the transmitter.

**Remote Channel:** Four remote lines are switched into channel 8 when mixed into either stereo or monophonic programming. The stereo mixer in channel 8 has a splitting pad on the input to permit feeding a monophonic source to both sides of the stereo mixer.

**Network Channel:** Channel 9 is the network channel. It is also a stereo mixer with a splitting pad on the input, since most network facilities are monophonic at the present time. Should this condition change, you simply remove the splitting pad and the full stereo facilities are restored. An occasional stereo network program could be patched into one of the stereo channels. A cue position permits previewing the network, then smoothly fading it into the program channel.

**Auxiliary Channel:** Channel 10 is the auxiliary channel, with two isolation transformers on the input of the stereo mixer to prevent any interaction or grounding problems with almost any input source.

**Cue-Intercom System:** The new cue-intercom system provides flawless network monitoring, remote over-ride, remote talk-back, studio intercom, turntable cueing, tape cueing and general previewing and cueing on all but the microphone channels. The control room and studio speakers are muted by the channel keys and muting relays when there is a live microphone in any of these locations.

The cue signals from channels 4 through 10 are fed into the cue-intercom amplifier regardless of the position of the cue selector switch.

**Program Switching Functions:** One front panel switch changes the master operation of the **EXECUTIVE** console from stereo to simultaneous or separate operation, as desired by the operator. Stereo program busses and stereo audition busses are designated: "Program Left," "Program Right," "Audition Left," and "Audition Right." The "Program Left" bus is permanently connected to the "Master Left" channel.

In the STEREO position, the input of the "Master Right" channel is connected directly to the "Program Right" bus. Thus, each half of the dual attenuators feed through a program amplifier to the stereo output line.

If the optional program amplifier is used during stereo programming, its input is bridged across the output of both the "Master Left" and "Master Right" channels. The output of the optional amplifier is then equal to L+R, the compatible stereo signal, and may be used to feed an AM transmitter.

In the SIMULTANEOUS position, the input of the "Master Right" channel is bridged off the output of the "Master Left" channel. This allows simultaneous programming of an AM and FM transmitter. If the optional program amplifier is used, its input can also bridge the output of the "Master Left" channel for simultaneous feed.

In the SEPARATE position, the input of the "Master Right" channel for the optional program amplifier is connected to the "Audition Left" bus, so separate programming may be fed to the AM and FM transmitters.

The left hand VU meter is connected to the output of the "Master Left" channel at all times. This is the "Left" channel in stereo programming. The right hand meter can also be switched to the output of the "Master Left" channel for a calibration check. It may also be switched to the output of the "Master Right" channel for stereo metering. In addition, it may be switched to the output of the optional program amplifier to check the level of the compatible stereo, or separate programming, to the AM transmitter. The next position on this switch connects the meter to the network feed to check the level of the network at any time. The last position is for external measurements.

**Dual Phone Jacks:** Stereo phone jacks are provided on a mounting plate and supplied with the **EXECUTIVE** console. Mounting holes are provided in the plate to permit its installation on the front or top of the desk, or in any convenient place for the operator.

**Stereo Monitoring Amplifiers:** Two 8 watt amplifiers are built in the **EXECUTIVE** for complete stereo monitoring. An input switch on the stereo monitoring amplifiers permits them to be connected to the output of the master channels, the output of the audition bus booster amplifiers, or to an external stereo input. Two sets of muting contacts on each relay permits muting of the stereo speakers—in the control room and the studios. These relays are completely encased, and plug-in for complete reliability and maintenance.

**Transistor Amplifiers:** The **EXECUTIVE** stereo console is completely transistorized, incorporating Gates' exclusive Solid Statesman transistor amplifiers. These are absolutely the finest and most advanced transistor audio amplifiers in the entire broadcast industry. Each specification reveals a story of unparalleled performance and reliability.

All amplifiers are plug-in type, with the exception of the stereo monitor amplifiers. The standard amplifier complement consists of:

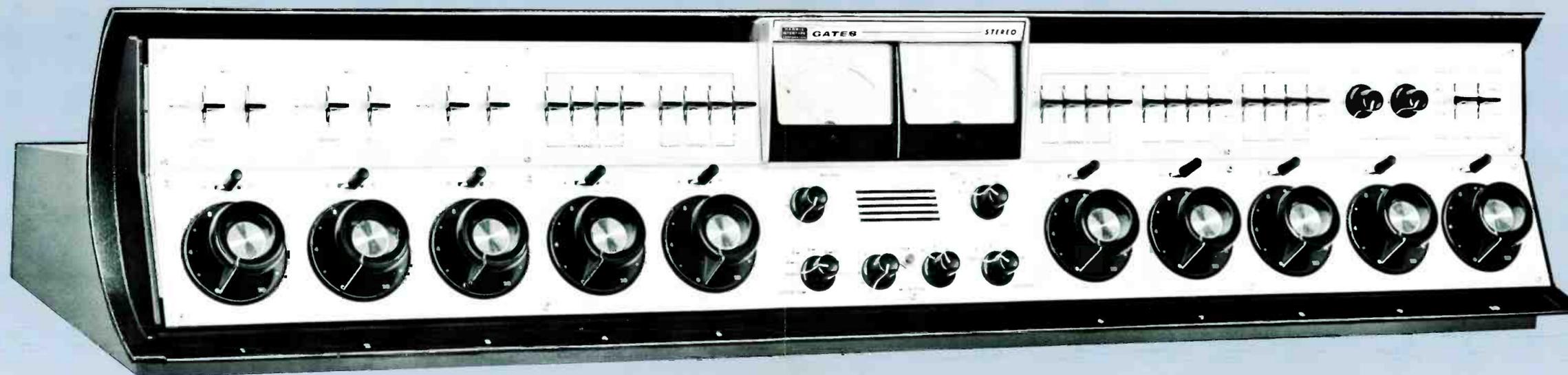
- 6 preamplifiers (3 pairs for stereo)
- 2 booster amplifiers (1 pair for stereo)
- 2 program amplifiers (1 pair for stereo)
- 2 monitor amplifiers (1 pair for stereo)
- 1 cue-intercom amplifier

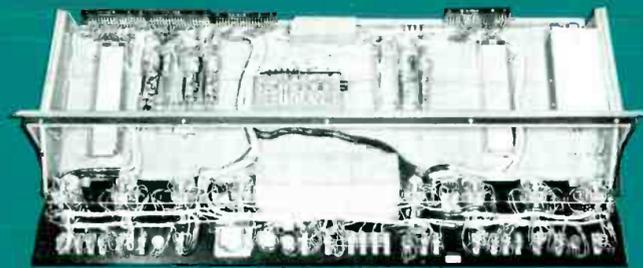
In addition, there is the regulated transistorized power supply and provisions for a third compatible program amplifier.

**Styling:** The styling concept of the **EXECUTIVE** follows the distinctive symbol of Gates' exclusive Solid Statesman line. The satin anodized aluminum control panel "floats" in a three-dimensional setting—outlined and accented in a sweeping crescent of mar-resistant black. The free-floating front panel and "flip-top" lid are hinged to provide full accessibility to all internal components.

The large primary control knob, designed exclusively for Gates and used on all input channels, has a prominent raised pointer to allow precise setting of any channel without visual observation. 2 1/4" wide at the top and standing 1 5/8" from front to panel, the index is a blade extending from pointer to center hub. The pointer may be used as a tab to easily fade one or more channels simultaneously with a single finger per knob. The design of these new knobs follows the concept that program control is "feel control."

# Ten Channel Transistor Audio Control Console





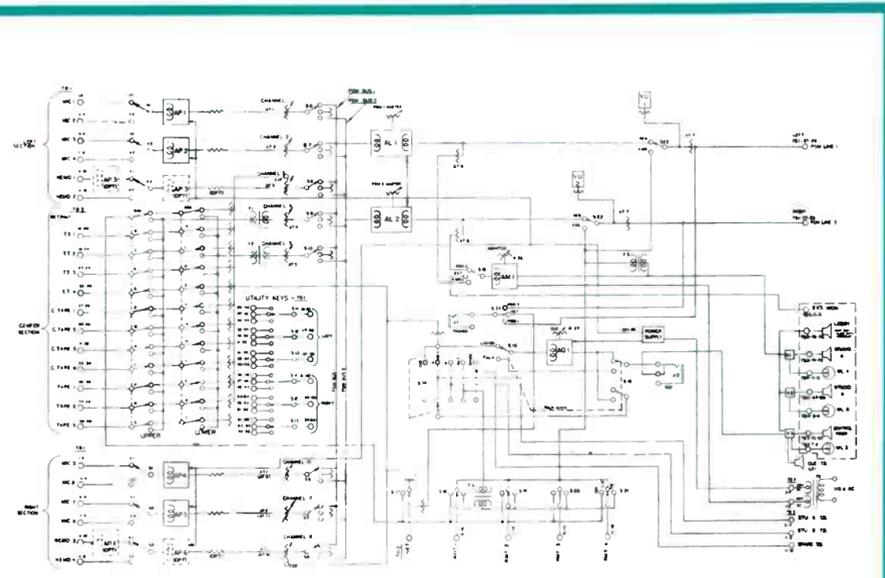
Free-floating front panel and removable lid are provided for full accessibility to internal components.



### PUSH-KEY SWITCHES

This is not the usual, inexpensive, push-button assembly found on early design audio consoles, but top quality, roller-actuated *push-key* switches. They are rugged and 100% reliable. The leaf sections have a positive wiping action, assuring dependable performance. Gold "reliability tested" contacts are on all program-carrying portions of the push-keys. The detail illustration reveals that construction is similar to the time-proven PBX type key. Contacts on each push-key station can be used to operate auxiliary relays on any or all of the 12 positions, to start turntables, tape recorders, cartridge equipment. Removed push-handle shows illuminated key feature.

Gates 12-station push-key control centers, which are exclusive with the President and Ambassador consoles, give you fast "touch-and-go" operation with the positive reliability of key switching.



The President  
BLOCK  
DIAGRAM

# The President

## SPECIFICATIONS

### MIXING CHANNELS: 8 Monophonic INPUTS:

- 12 Microphones into 6 preamplifiers (with 2 optional preamplifiers.)
- 11 Turntables, tape and projector inputs.
- 4 Remote lines.
- 1 Network.

### OUTPUTS:

- 2 Program lines.
- 3 Muted speaker outputs.
- 1 Unmuted speaker output.
- 2 Interlocked studio intercom speakers.
- 2 Headphone outputs.

### AMPLIFIERS:

- 6 Plug-in transistor preamplifiers.
- 1 Microphone preamplifier standard.
- 2 Optional microphone preamplifiers (where ordered).
- 2 Plug-in transistor program amplifiers.
- 1 Plug-in transistor cue-intercom amplifier.
- 1 Full level transistor monitor amplifier.

### POWER SUPPLY:

- 1 Fully regulated, electronically protected transistor power supply.

### GAIN:

- Microphone input to line output: 104 db  $\pm$  2 db.
- Turntable input to line output: 62 db  $\pm$  2 db.
- Microphone input to speaker output: 106 db minimum.
- Turntable input to speaker output: 64 db minimum.

### FREQUENCY RESPONSE:

- $\pm$ 1.5 db from 20 to 20,000 cps in all regular program circuits (typical).
- $\pm$ 2.0 db from 20 to 20,000 cps in all monitor speaker circuits (typical).
- $\pm$ 1.0 db from 30 to 15,000 cps in all regular program circuits.
- $\pm$ 1.5 db from 30 to 15,000 cps in all monitoring speaker circuits.

### HARMONIC DISTORTION:

- 0.5% Maximum, 20 to 20,000 cps at +8 dbm in all regular program circuits (typical).
- 1.0% Maximum, 20 to 20,000 cps at +38 dbm in all monitor speaker circuits (typical).
- 0.5% Maximum, 30 to 15,000 cps at +8 dbm output in all regular program circuits.
- 0.5% Maximum, 50 to 15,000 cps at +18 dbm output in all regular program circuits.
- 1.0% Maximum, 50 to 15,000 cps at +39 dbm (8 watts) in speaker outputs.

### INTERMODULATION DISTORTION:

- 0.5% maximum in program circuits.
- 1.0% maximum in monitor circuits.

### SOURCE IMPEDANCE:

- Microphones—30/50 or 150/250 ohms.
- Turntable/tape/projector/remote/network—600 ohms.

### LOAD IMPEDANCE:

- 2 Program lines—600 ohms.
- Speaker outputs—4 to 16 ohms.
- Recording output—600 ohms.

### NOISE:

- 122 dbm relative input noise on microphone channels.
- 75 dbm relative input noise on turntable channels.

### CROSSTALK:

- Below noise level in all channels.

### TRANSISTOR COMPLEMENT:

- 7 Industrial type—totaling 55.

### POWER CONSUMPTION:

- Approx. rated 42 watts at 110/117/125 volts.
- 50 W cps.

### SIZE:

- 23 $\frac{3}{8}$ " long, 11 $\frac{3}{8}$ " high, 17 $\frac{3}{8}$ " deep.

### WEIGHT:

- 114 pounds, net.

### FINISH:

- Paint in anodized black nomenclature on natural anodized aluminum background panels, on medium gray cabinet.

## ORDERING INFORMATION



The President dual channel monophonic audio control console, complete with 4 preamplifiers, 2 program amplifiers, monitor amplifier, cue-intercom amplifier, power supply and 2 external VU meters..... **M-6209A**  
 Extra preamplifiers ..... **M-6034**  
 Intercom sub-station ..... **M-5303**



GATES RADIO COMPANY • QUINCY, ILLINOIS • 62301 • U.S.A.  
 A subsidiary of Harris-Intertype Corporation

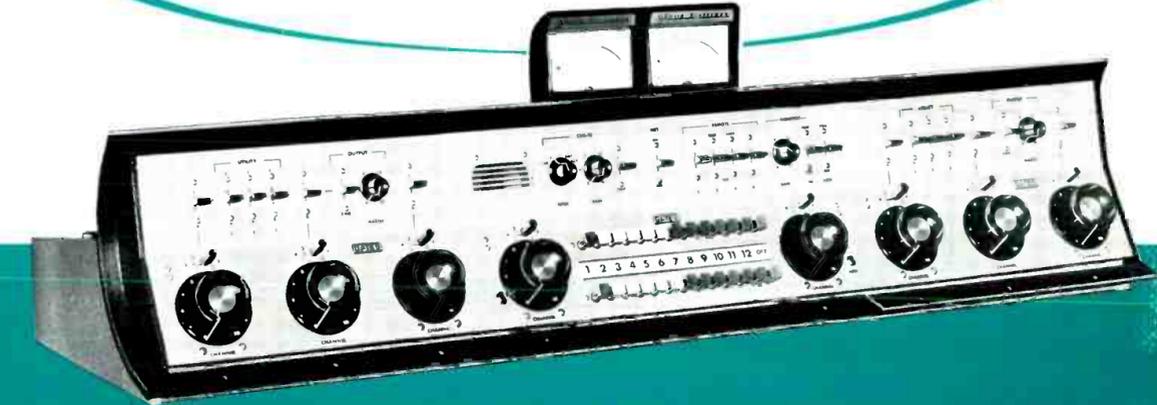
Litho on Harris-Intertype

CP-2.5-566

ADV-1068

# The President

## Dual Channel Transistor Audio Control Console



- Two illuminated banks of 12-position push-keys form a comprehensive medium level input control center.
- Completely transistorized, utilizing Gates *Solid Statesman* transistor amplifiers for superb performance.
- Wide-scope VU meters designed to be placed either on console housing or desk top.
- Completely self-contained. (A small primary isolation transformer is the only external item.)
- Gold "reliability-tested" contacts on all program carrying portions of the push-key switches.
- Contacts on each push-key station can be used to operate auxiliary relays on any or all of the 12 positions to start tape machines, turntables, projectors.
- Fully interlocked cue-intercom system with *Cue*, *Studio A Intercom*, *Studio B Intercom*, *Remote Talk-Back* and a *Spare* input position.
- Network cueing through cue speaker allows headphones to remain at output line position, to assure continuity of program thought and context.
- Signal levels are fixed-pad compensated throughout the console to minimize the necessity of re-adjusting gain controls when switching from one circuit to another.
- Regulated solid state power supply protects the console amplifiers from variations due to line and load regulation.
- Low impedance wiping contact step attenuators used in all input channels to provide time-proven trouble-free service.
- Exclusive "VA" fader controls with wing index fits naturally on the hand for "feel-of-the-board" control.
- A specially designed "top-hat" knob distinguishes the secondary controls.
- The free-floating front panel and "flip-top" lid are hinged to provide full accessibility to the internal components.
- Dramatic styling by one of America's foremost industrial designers.

from the Exclusive

**GATES** Solid Statesman Line

Dual Channel Transistor  
Audio Control Console  
Solid Statesman Line

## The President

*The President* is a completely transistorized dual channel audio control console, providing eight input mixing channels. It is distinctively designed with a totally new 12-position "control center"—activated by an array of illuminated gold-contact push-keys for precise fingertip command of input circuits. Twenty-eight inputs are provided in *The President*. When all six of the 3-position utility switches are used to expand the input facilities, a total of 45 inputs are available.



### GENERAL INFORMATION

**Mixing System:** Eight monophonic input mixing channels are provided utilizing low impedance, ladder type controls. Key selection allows any mixer to feed either program channel.

**Microphone Channels:** Eight microphones can be switched into four channels. Channels 1, 2, 6 and 7 each handle two microphones. Speaker muting is switched with mike selection. Channels 3 and 8 each provide two optional medium level or microphone level service by the addition of the optional plug-in microphone preamplifiers. If the preamplifiers are connected ahead of the input selector switch, the channels can fill the dual role of a microphone and medium level channel.

**Medium Level Inputs:** Two multiple station, illuminated push-keys provide 12 positions and "off" as a control center for all medium level inputs. This category includes turntables, cartridge tape systems, reel-to-reel tapes and projectors. The upper bank feeds into channel four, the lower into channel five. When the input positions are not switched into either channel, they are automatically connected to the cue bus for preview or cueing. The switches will accommodate 11 of the medium level inputs, plus the network and four remote lines into the 12th position. Thus, channels 4 and 5 account for 16 of the vital input circuits in a smoothly coordinated control center.

A large designation strip is placed between the rows of push-keys to permit abbreviating, numbering or lettering the input to each key.

Gold program circuit contacts provide reliable maintenance-free "dry contact" operation of the push-key switches. Silver alloy DC switching contacts illuminate the depressed station.

Isolation transformers are used generously in all of the critical circuits connected external to the "President."



**Cue-Intercom System:** A fully interlocked cue-intercom system is incorporated in *The President*. The cue position of mixing channels 3 and 8, the network input or any of the 12 push-key stations may feed the cue amplifier, regardless of the position of the cue amplifier input selector switch.

The input selections are: Cue, Studio A Intercom, Studio B Intercom, Remote Talk-Back and a Spare input position. All other functions are disconnected in the Cue position. Other input selections provide intercom service in addition to cue. The wiring of the cue intercom input selector switch prevents the intercom amplifier from feeding unwanted signals into any external circuit.

**Muting Relays:** The speaker muting relays have extra intercom muting contacts to prevent feeding an intercom signal into the studios when a live microphone is in use. The control room muting relay is factory wired to mute the console speaker for any type of signal when the control room microphone is in use. A cue phone jack permits headphone monitoring of the cue-intercom circuits during these periods.

**Transistor Amplifiers:** *The President* dual channel console is completely transistorized, incorporating Gates exclusive Solid Statesman transistor amplifiers to meet the expanded and exacting tests of performance and reliability. The standard amplifier complement consists of:

- 4 Plug-in transistor microphone preamplifiers
- 2 Optional additional transistor preamplifiers
- 2 Plug-in transistor program amplifiers
- 1 Plug-in transistor cue-intercom amplifier
- 1 Full level transistor monitoring amplifier
- 1 Fully regulated transistor power supply

The 10 db overload capacity of the program amplifiers, coupled with at least 20 db overload capacity in the microphone preamplifiers, make *The President* almost impervious to excessive program levels. The 6 db line isolation pad permits the connection of this console to highly reactive telephone lines without any noticeable interaction. The low distortion and flat response of the program amplifier chain provides quality that surpasses the measurement capabilities of most test instruments.

The +39 dbm (8 watt) capability of the transistor monitor amplifier is combined with flat response, low harmonic and intermodulation distortion that is almost beyond belief. The full level cue-intercom amplifier is peaked for maximum clarity with a pleasing, yet penetrating difference in sound from the monitoring system.

The regulated power supply protects the console amplifiers from variations due to line and load regulation. In addition, the power supply ripple is reduced to the point of non-existence to assure uniformly low noise in all of the console circuits. The power supply is also short-circuit protected to prevent damage to any of the transistors in either the power supply or amplifiers from a momentary or sustained short in any of the circuits.

**Styling:** The styling concept of *The President* follows the distinctive symbol of Gates' exclusive Solid Statesman line. The satin anodized aluminum control panel "floats" in a three-dimensional setting—outlined and accented in a sweeping crescent of mar-resistant black. The free-floating front panel and "flip-top" lid are hinged to provide full accessibility to all internal components.

The large primary control knob, designed exclusively for Gates and used on all input channels, has a prominent raised pointer to allow precise setting of any channel without visual observation. 2 1/4" wide at the top and standing 1 5/8" from front to panel, the index is a blade extending from pointer to center hub. The pointer may be used as a tab to easily fade one or more channels simultaneously with a single finger per knob. The design of these new knobs follows the concept that program control is "feel control."

Multi-position illuminated VU meters are provided with *The President*. They may mount anywhere along the top rail of the console, or with the mounting clip removed, be placed on the console desk. This feature is an additional aid in customizing this console to the requirements of the individual station. The meters are mounted in sturdy cast aluminum housings with interconnecting cables and plugs.



# DIPLOMAT

## SPECIFICATIONS

**OPERATING MODE:** Monaural, dual channel programming.

**MIXING CHANNELS:** Total —10. Three microphone, two turntables, two tape, one remote, one network and one auxiliary.

**INPUT CIRCUITS:** Total —20. Six microphone, four turntable, four tape, four remote lines, one network line and one auxiliary.

**AMPLIFIERS AND POWER SUPPLIES PROVIDED:** Three preamplifiers, two program amplifiers, one cue/intercom amplifier, one monitor amplifier and one power supply.

**OUTPUT CIRCUITS:** Two program outputs @ +8 VU, one monitor speaker output, unmuted (for lobby), four monitor speaker outputs, muted, two studio intercom outputs (Studio A, Studio B), and two headphone outputs.

**MONITOR OUTPUT:** 8 ohms nominal (4 to 16 ohms may be used). 8 watts (+39 dBm) output.

**GAIN:** Microphone to Line: 102 dB  $\pm$ 2 dB. Turntable/Tape/Auxiliary Inputs to Line: 56 dB  $\pm$ 2 dB. Remote and Network Inputs to Line: 50 dB  $\pm$ 2 dB.

**IMPEDANCES:** Microphones: 30/50 or 150/250 ohms, balanced. Turntable/Tape/Network/Auxiliary: 600 ohms, unbalanced. Remote Inputs: 600 ohms, balanced.

Program Line Output: 600 ohms, balanced. Monitor Speaker Output: 4 to 16 ohms, unbalanced.

**RESPONSE:** Program:  $\pm$ 1.0 dB, 30 Hz to 15,000 Hz @ +8 dBm.

Monitor:  $\pm$ 1.5 dB, 30 Hz to 15,000 Hz @ +39 dBm.

**DISTORTION:** Program: 0.5% maximum, 30 Hz to 15,000 Hz @ +8 dBm.

Monitor: 1.0% maximum, 50 Hz to 15,000 Hz @ +39 dBm.

**NOISE:** Program: 62 dB below +8 dBm output with —60 dBm input (—122 dBm equivalent input noise, measured 20 Hz to 20,000 Hz).

**FINISH:** Anodized aluminum front panel with satin anodized black lettering. Cabinet is finished in neutral beige.

**POWER:** 117 volts, 50/60 Hz, single-phase, 40 watts.

**MECHANICAL SIZE:** 53½" long, 11¾" high, 17¾" deep.

### ORDERING INFORMATION

The Diplomat, ten channel transistor dual programming audio control console, complete with preamplifiers, program amplifiers, cue intercom amplifier, monitor amplifier, and power supply ..... 994-6377  
 Optional microphone preamplifier ..... 994-6034  
 Optional third program amplifier ..... 994-5700

### HOME OFFICE AND MANUFACTURING FACILITIES

QUINCY, ILLINOIS 62301  
 123 Hampshire Street  
 Phone: 222-8200, Area 217

### AUTOMATIC TAPE CONTROL DIVISION

BLOOMINGTON, ILLINOIS 61702  
 1107 East Croxton Avenue  
 Phone: 829-7006, Area 309

### STOCK CARRYING BRANCH

HOUSTON, TEXAS 77027  
 4019 Richmond Avenue  
 Phone: 666-4333, Area 713

### DISTRICT OFFICES

NEW YORK, NEW YORK 10017  
 800 Second Avenue  
 Phone: 687-7971, Area 212

LOS ANGELES, CALIFORNIA 90007  
 1945 South Figueroa  
 Phone: 747-7129, Area 213

WASHINGTON, D. C. 20005  
 730 Federal Building  
 1522 K Street, N.W.  
 Phone: 223-5508, Area 202

### EXPORT SALES

ROCKE INTERNATIONAL CORPORATION  
 13 East 40th Street  
 New York, New York 10016  
 Phone: 689-0200, Area 212  
 Cables: ARLAB

### CANADIAN SALES

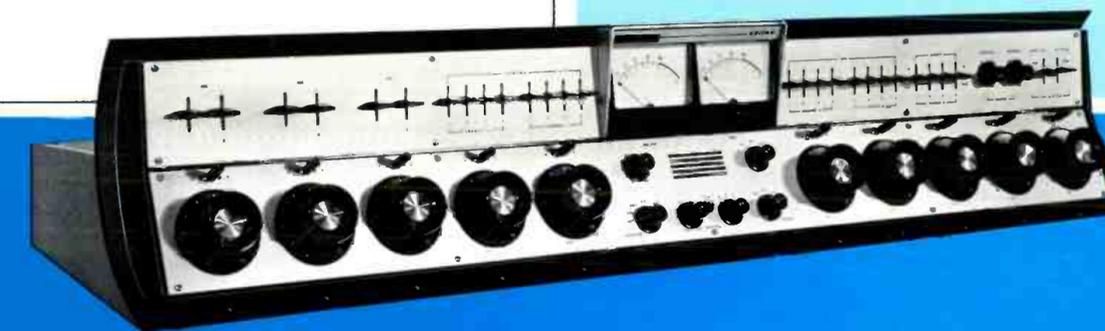
GATES RADIO COMPANY (CANADA)  
 Division of Harris-Intertype (Canada) Ltd.  
 Montreal Office  
 212 Brunswick Boulevard  
 Pointe-Claire, Quebec, Canada  
 Phone: 695-3751, Area 514

Toronto Office  
 19 Lesmill Road  
 Don Mills, Ontario, Canada  
 Phone: 447-7234, Area 416

# GATES DIPLOMAT

TEN CHANNEL  
SOLID STATE  
AUDIO CONTROL  
CONSOLE

from the **GATES** solid  
statesman line



- Dual Channel Monophonic
- Ten flexible mixing channels—20 inputs.
- Solid State plug-in modular amplifiers.
- Cue-Intercom system built-in.
- Large feel-of-the-board control knobs.
- Easy access to all components.
- Dual channel flexibility.
- Provision for spare microphone preamplifiers and program amplifier.

HARRIS  
INTERTYPE  
CORPORATION

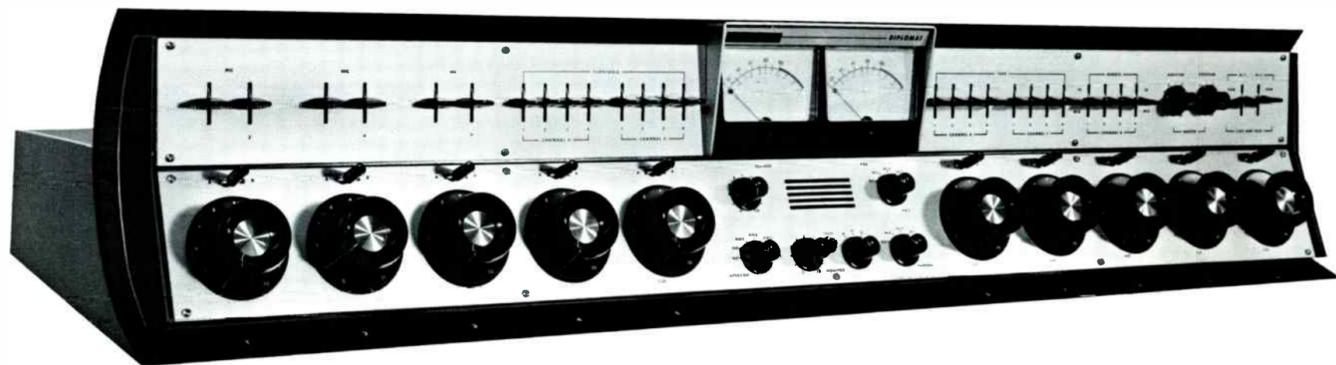
# GATES®

# GATES DIPLOMAT

The Diplomat 10 channel all solid-state console is a full facility audio system designed to meet today's critical requirements in AM, monaural FM and TV broadcasting.

The Diplomat has wide flexibility in audio inputs, resulting in a unit which provides versatility in operation.

Twenty inputs feed into the ten mixing channels without patching. Full patching of the Diplomat is facilitated by simply removing terminal board jumpers and wiring these circuits to an optional patch panel.



## Dual Programming Ten Channel Transistor Console

### MIXING SYSTEM:

Ten-channel mixer utilizing low impedance, ladder type controls in a parallel, minimum-loss type mixing circuit.

### MICROPHONE CHANNELS:

Six microphone sources can be individually switched from the front panel to three channels. Microphone transfer switches are located immediately above the microphone mixing channels. A second unwired switch by each microphone selector provides utility keys for added facilities. Provisions are included for adding two optional preamplifiers.

### MEDIUM LEVEL CHANNELS:

Channels 4 and 5 have switching to accommodate medium level inputs (turntables) into either channel in any sequence. Similarly, Channels 6 and 7 have switching to accommodate four inputs (tape) into either Channel 6 or 7 in any sequence. Four remote lines may be switched into Channel 8. Channel 9 is intended for use as the network input. This provides the continuous convenience of monitoring network or recording network programs for delayed broadcasts regardless of any other medium level input in use. Channel 10 is an auxiliary channel and may be used for any special input.

All medium level channels have cue facilities and, in addition, Channel 8 has in-built talk-back facilities.

### MONITOR SPEAKER MUTING:

The control room and studio speakers are muted by the channel keys and plug-in muting relays when there is a live microphone in use in any of these locations.

### PROGRAM OUTPUTS:

The Diplomat is a full facility, dual channel console. Separate line amplifiers provide two, +8 VU line feeds.

The program channel line amplifier is permanently connected to feed the primary output line from the console. One VU meter monitors this channel at all times.

Using convenient front panel switching, the second line amplifier can feed the output of the audition channel or duplicate the program channel.

An unwired, utility output key is provided for situations requiring additional output switching.

The second VU meter can be switched to monitor the primary program channel, the output of the second line amplifier, the incoming network level, and an external utility input.

Provisions are included for adding a third program amplifier for use as a program spare.

### DUAL PHONE JACKS:

Phone jacks are provided on a mounting plate and supplied with the Diplomat console. Mounting holes are provided in the plate to permit installation on the front or top of the desk, or in any convenient place for the operator.

### MONITORING AMPLIFIER:

The Gates M-6108, 8 watt amplifier is used in the Diplomat for high fidelity monitoring. The front panel monitor selector switch permits the monitor amplifier to be connected to the output of the program channel, the output of the audition amplifier, or to an external input. Muting contacts on each interlock relay permit muting of the speakers in the control room and the studios. These relays are completely encased, and plug-in for complete reliability and easy maintenance.

### TRANSISTOR AMPLIFIERS:

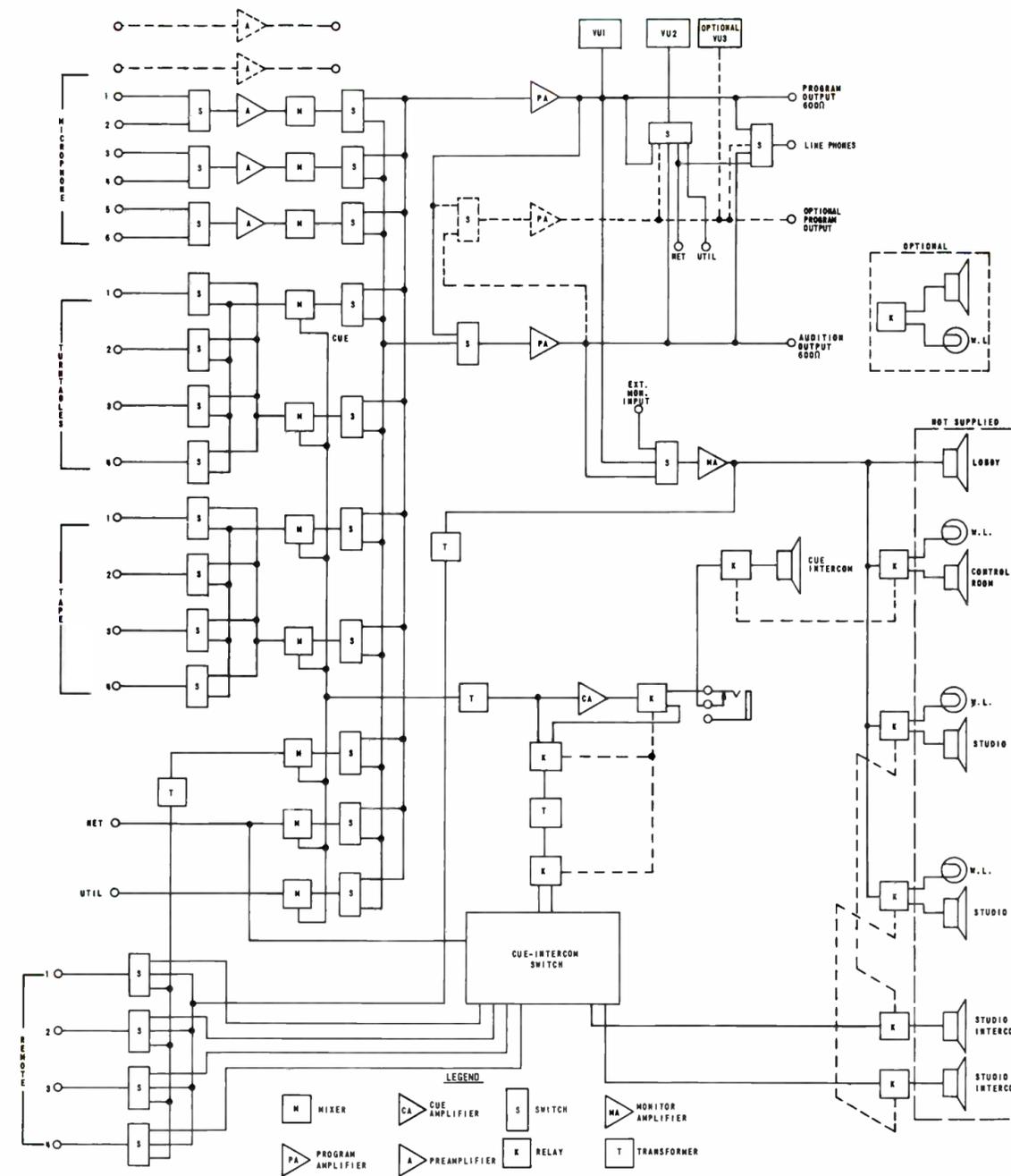
The Diplomat console is completely transistorized. Highest quality components are used throughout to provide the finest in electronic performance and operational reliability.

All amplifiers are plug-in type, with the exception of the monitor amplifier.

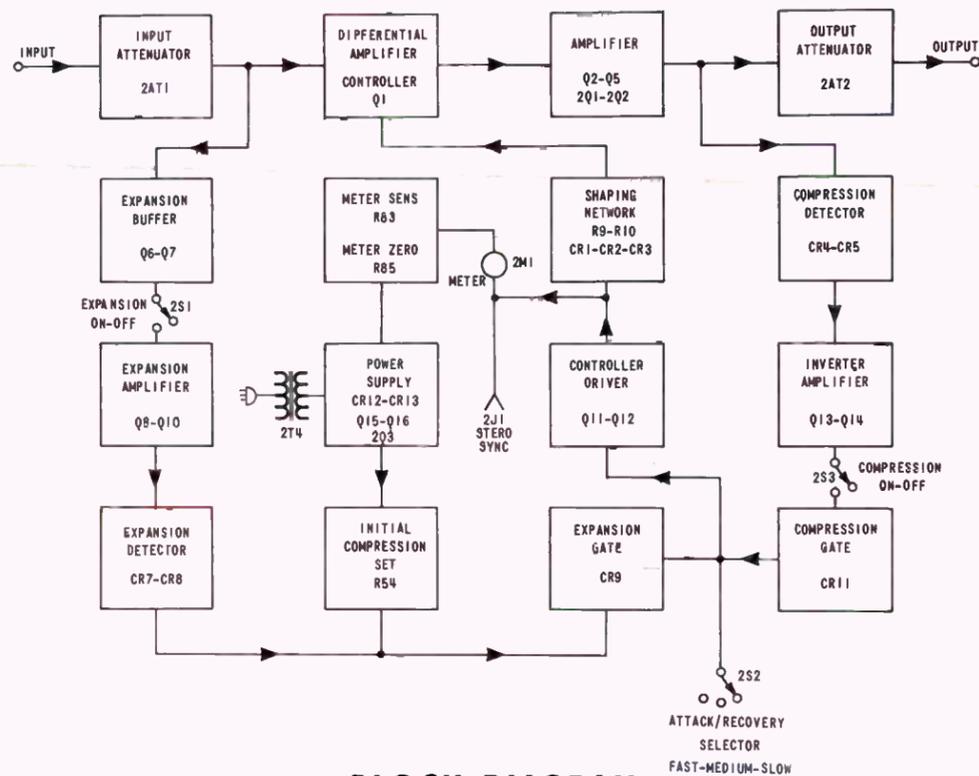
### STYLING:

The satin anodized aluminum control panel "floats" in a three-dimensional setting outlined and accented in a sweeping crescent of mar-resistant black. The free-floating front panel and "flip-top" lid are hinged to provide full accessibility to all internal components.

The large primary control knob, designed exclusively for Gates and used on all input channels, has a prominent raised pointer to allow precise setting of any channel without visual observation. Two and one-quarter inches wide at the top and standing 1 3/8" from front to panel, the index is a blade extending from pointer to center hub. The pointer may be used as a tab to easily fade one or more channels simultaneously with a single finger per knob. The design of these new knobs follows the concept that program control is "feel control."



DIPLOMAT CONSOLE  
BLOCK DIAGRAM



**BLOCK DIAGRAM**

**SPECIFICATIONS**

**GAIN:** All figures given with no attenuation in input and output controls (wide open).

**MAXIMUM GAIN:** 50 dB  $\pm 2$  dB @ 1 kHz with maximum expansion.

**NOMINAL GAIN:** 35 dB  $\pm 2$  dB @ 1 kHz with nominal signal (15 dB of compression) or no signal condition.

**MINIMUM GAIN:** 20 dB  $\pm 2$  dB @ 1 kHz with full (30 dB) compression.

**FREQUENCY RESPONSE:**  $\pm 1.0$  dB, 30 Hz to 16 kHz with or without compression.

**NOISE:** 70 dB below the threshold of compression.

**COMPRESSION ATTACK TIME:** 30 dB, selectable. Fast: 100  $\mu$  Sec. Medium: 1-2 M Sec. Slow: 30 M Sec.

**COMPRESSION RECOVERY TIMES:** 30 dB, dependent upon compression attack time. Fast: 12 Sec. Medium: 22 Sec. Slow: 53 Sec.

**EXPANSION ATTACK TIMES:** 15 dB, dependent upon compression attack time. Fast: 7.5 Sec. Medium: 15 Sec. Slow: 35 Sec.

**EXPANSION RECOVERY TIMES:** 15 dB, dependent upon compression attack time. Fast: 4 Sec. Medium: 5 Sec. Slow: 10 Sec.

**AMOUNT OF COMPRESSION:** 30 dB.

**AMOUNT OF EXPANSION:** 15 dB.

**COMPRESSION RATIO:** Better than 30:1, a 30 dB increase in the input signal will produce less than 1 dB rise in the output level.

**INPUT LEVEL:** -15 dBm to +25 dBm for 15 dB of compression.

**OUTPUT LEVEL:** Adjustable to +20 dBm maximum with compression, +30 dBm amplifier maximum.

**INPUT AND OUTPUT IMPEDANCE:** 600 ohms, balanced or unbalanced.

**DIMENSIONS:** 3 1/2" H x 13 5/8" D x 19" W (Standard rack).

**WEIGHT:** 14 lbs. net. 23 lbs. shipping.

**TEMPERATURE RANGE:** -20°C to +55°C. -4°F to +131°F.

**INPUT VOLTAGE:** 117/234 V, 50/60 Hz.

**INPUT POWER:** 5 watts.

**ORDERING INFORMATION**

Solid Statesman Automatic Gain Control Amplifier ..... 994-6629



GATES RADIO COMPANY • QUINCY, ILLINOIS • 62301 • U.S.A.  
A division of Harris-Intertype Corporation

GATES

SOLID STATESMAN  
AUTOMATIC GAIN  
CONTROL AMPLIFIER



# SOLID STATESMAN AUTOMATIC GAIN CONTROL AMPLIFIER

- Selectable Attack/Recovery Times  
Fast — Medium — Slow
- Separate expansion and compression dis-  
able switches
- Separate input and output attenuators
- All silicon solid state circuitry
- Differential amplifier gain controlling circuit
- Fully RF protected
- Excellent frequency response
- Low distortion
- Extended control range (30 dB)
- Two AGC's easily synced for stereo  
operation
- Fully field tested

Gates Solid Statesman AGC Amplifier (M-6629) is the most versatile automatic gain control system available today. A wide range of control on the amplifier, and an adjustable attack/recovery time feature, insure programming flexibility. The high compression ratio and rapid attack time generate consistently high modulation levels, while the slow attack/recovery mode will maintain control over average program material and extend dynamic range.

## SELECTABLE ATTACK RECOVERY TIMES

The wider control range, lower distortion and rapid attack time are made possible by the use of a "differential amplifier" as the gain controlling device. Extremely close balance of this amplifier provides the desirable characteristics of the M-6629. Another feature is the selectable attack/recovery time which allows each station to select the control time best suited to its program format.

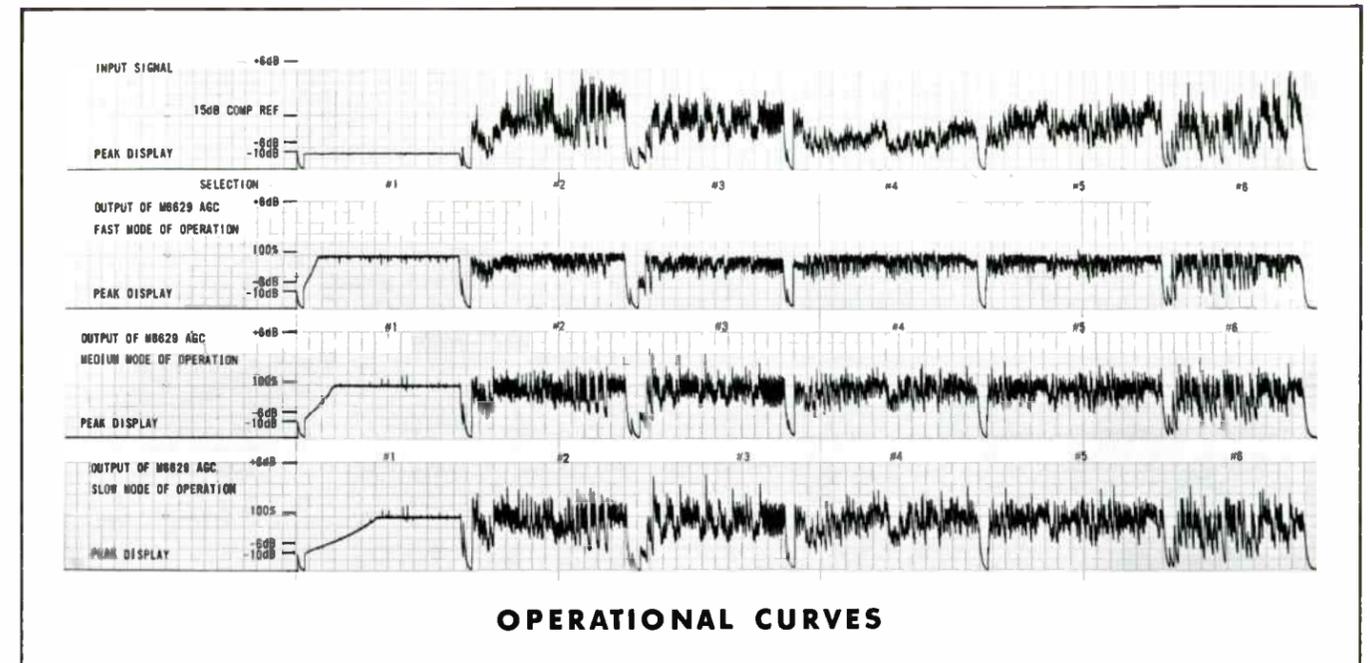
In the FAST mode, the reaction time is similar to that of other limiters now on the market. This operating mode is most desirable for those stations wanting the highest possible modulation levels.

In the MEDIUM and SLOW modes, reaction times are considerably slower. These operating modes are available to those stations which desire a lesser amount of control action than that found in the FAST mode.

Two Solid Statesman AGC Amplifiers may be synced together for stereo operation. A small jumper cable is all that is required.

## CENTRALIZED OPERATING CONTROLS

Front panel controls permit the user to disable both the expansion and compression functions

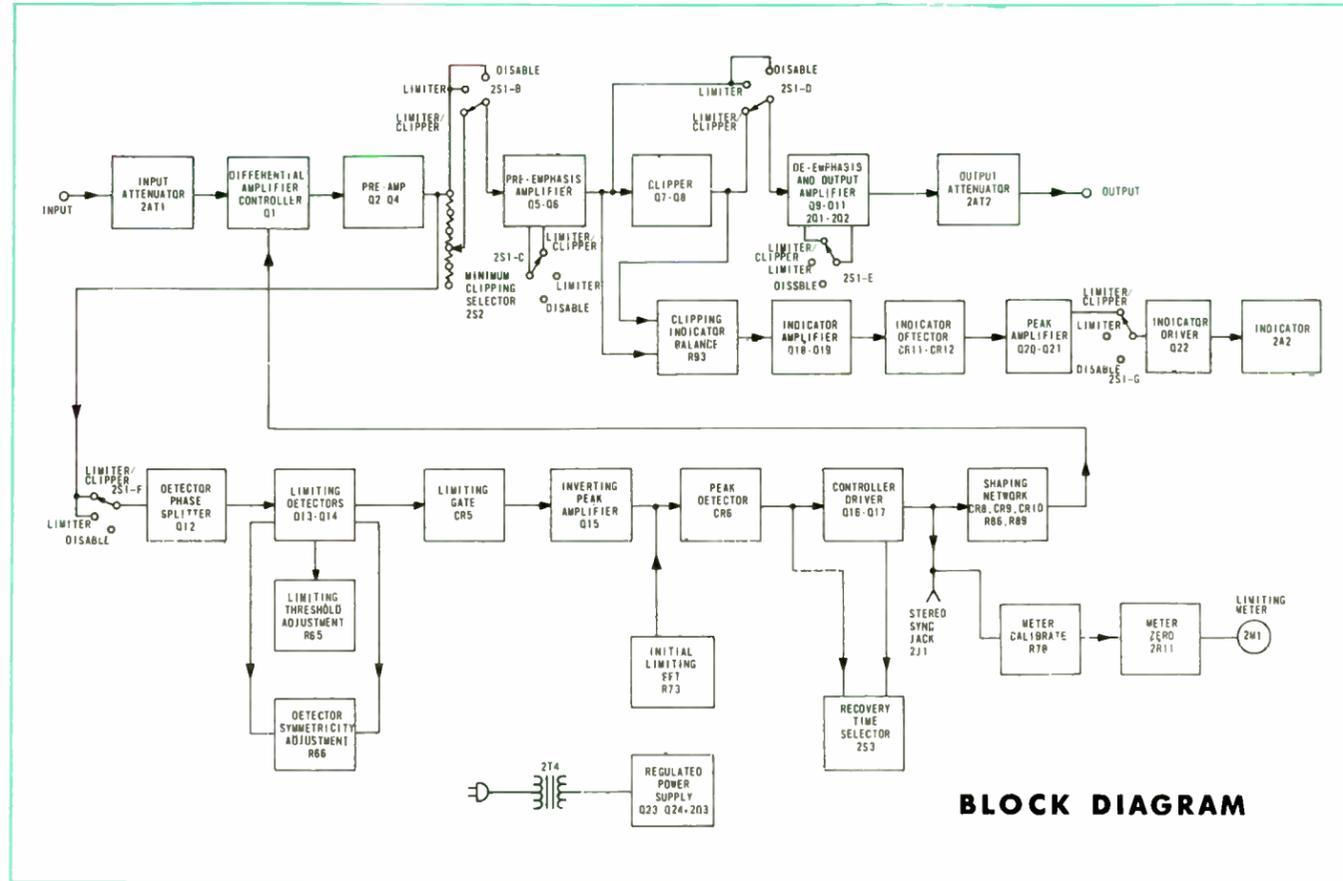


separately for proof of performance tests. Under these conditions the unit has the same gain as when 15 dB of compression, the ideal operating point, is being used. This provides a test position and at the same time maintains system calibration.

Only 3½" of standard rack space is required

for the M-6629. All operating controls are located behind the easily removable access panel. Circuit components are readily accessible by removal of the top cover. Input and output connections are provided on a barrier terminal block on the rear of the unit, along with the stereo sync jack and AC power and fuse.





**BLOCK DIAGRAM**

# GATES

## SOLID STATESMAN FM LIMITER

### SPECIFICATIONS

- GAIN:** 50 dB,  $\pm 2$  dB max. @ 1 kHz. (May be reduced by built-in input and/or output attenuators).
- FREQUENCY RESPONSE:**  $\pm 1.0$  dB, 30 Hz to 16 kHz, below threshold of instantaneous limiter.
- HARMONIC DISTORTION:** 1% Max. 30 Hz to 16 kHz, below limiting, or at 10 dB of limiting in any recovery made.
- NOISE:** 70 dB below the threshold of limiting. (Limiting Threshold 30 Hz to 16 kHz.)
- ATTACK TIME:** 40 microseconds, maximum (no "thumping").
- RECOVERY TIME:**—Selectable:  
 FAST: Dynamically Gated for 200 milliseconds  
 MEDIUM: 2 seconds  
 SLOW: 10 seconds
- AMOUNT OF LIMITING:** 30 dB.

- LIMITING SLOPE:** Better than 30:1. (A 30 dB increase in the input signal will produce less than a 1 dB rise in the output level.)
- INPUT LEVEL:** -17 dBm to +23 dBm for 10 dB of limiting.
- OUTPUT LEVEL:** Adjustable to +23 dBm maximum with limiting, +30 dBm amplifier maximum.
- INPUT AND OUTPUT IMPEDANCE:** 600 ohms, balanced or unbalanced.
- DIMENSIONS:** 3½" H x 13⅝" D x 19" W (standard rack).
- WEIGHT:** 14 lbs. net; 23 lbs. shipping.
- TEMPERATURE RANGE:** -20°C to +55°C. -4°F to +130°F.
- INPUT POWER:** 115/230 volts, 50/60 Hz, 5 watts.

### ORDERING INFORMATION

Solid Statesman FM Limiter ..... 994-6631



GATES RADIO COMPANY • QUINCY, ILLINOIS • 62301 • U.S.A.  
A division of Harris-Intertype Corporation



# SOLID STATESMAN FM LIMITER

## IMPORTANT FEATURES

- Selectable recovery times  
FAST • MEDIUM • SLOW
- Selectable frequency threshold for instantaneous peak controlling
- High compression ratio—greater than 30:1
- High output modulation due to unique dynamic recovery circuit
- Separate input and output attenuators
- Extended control range (30 dB)
- Low distortion
- Fully field tested

Gates' new Solid Statesman FM Limiter (M-6631) is designed to prevent FM over-modulation, while retaining the original fidelity of the program material. This is accomplished through a combination of limiting, pre-emphasis, instantaneous peak controlling and de-emphasis.

A wide control range, low distortion and rapid attack time are outstanding features of the M-6631—made possible by the extremely close

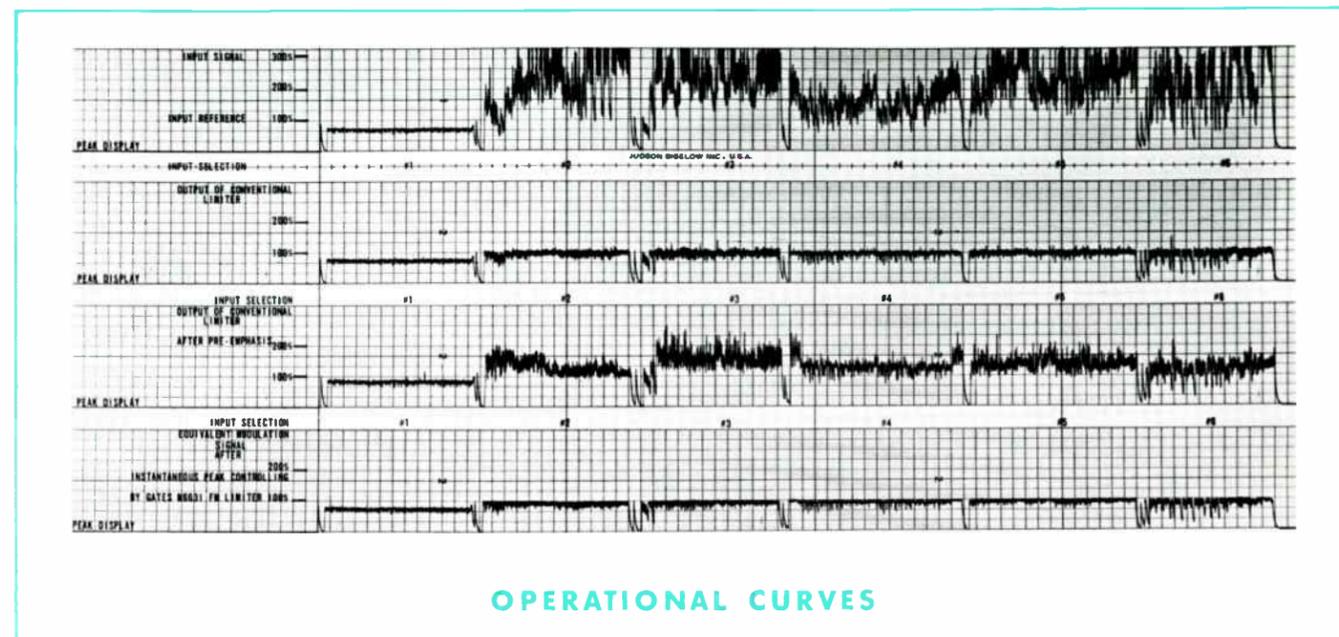
balance of the "Differential Amplifier" used as the gain control device.

Another important feature is the selectable recovery time, which allows each station to choose the best recovery time (FAST, MEDIUM, SLOW) for its type of programming.

In the FAST mode of operation the FM Limiter has dynamic gated recovery. This permits very fast (200 millisecond) recovery times for the highest possible modulation levels, while distortion figures are almost as low at 30 Hz operation as at 1000 Hz.

The MEDIUM and SLOW positions are conventional and offer slower recovery times for stations desiring protection from over-modulation, but more subtle operation.

The selectable frequency threshold for instantaneous peak controlling permits the local station to select the frequency at which the instantaneous peak controller starts operating. This control function is related to the FCC 75 microsecond pre-emphasis curve, and is intended to offer stations



OPERATIONAL CURVES

positive protection, but lesser amounts of control action if desired.

Two FM Limiters may be synced together for stereo operation with a small phone jumper.

A front panel control permits the user to disable the unit for proof of performance tests.

Only 3 1/2" of standard rack space is required for the M-6631 FM Limiter. All operating controls are located behind the easily removed front access panel. Circuit components are readily accessible by removing the top cover. Input and output connections are provided on a barrier terminal block on the rear of the unit along with the stereo sync jack and AC power and fuse.



... from the Exclusive **GATES** Solid Statesman Line

# DUALUX II

## EIGHT CHANNEL TRANSISTOR AUDIO CONTROL CONSOLE

... featuring the versatile Program Output Selector



### features:

- Control AM, FM, FM stereo, and SCA from one point during all or part of the broadcast day.
- Versatile audio switching.
- Twenty-two Inputs—13 mono and 6 stereo sources plus inputs from automation equipment, network, and an SCA channel.
- Micro-Muting—Silences loudspeakers in micro-seconds.
- Solid State monitor amplifiers for mono and stereo.
- Program Output Selector permits simultaneous or independent mono or stereo mixing.
- Extremely low distortion.
- Interchangeable Cue, Program, and Monitor Amplifiers for greatest reliability.
- Unexcelled frequency response.
- Cue Intercom to two studios built-in.
- All solid state modular amplifiers with printed circuit boards.
- Attractive, contemporary styling.

## DUALUX II Specifications

### MIXING CHANNELS:

Total 8. Two microphone—mono. One microphone—stereo. Two turntable/tape—stereo. Two turntable/tape—mono. One remote/network—mono.

### INPUT CIRCUITS:

Total 22. Four microphones—mono. Two microphones—stereo pair. Four turntable/tape—stereo pair, four turntable/tape—mono. Four remote lines, one network, one SCA source—mono, two automation sources—stereo pair.

### AMPLIFIERS AND POWER SUPPLIES PROVIDED:

Four preamplifiers, six output modules—program/monitor/cue (all interchangeable as supplied). Two muting modules, four power supply modules, and M-6556B transformer panel.

### OPERATING MODE:

Tri-channel—mono/stereo simultaneously, or 3 channel monophonic.

### OUTPUT CIRCUITS:

Three program outputs @ +8 VU, three record outputs @ -16 VU, (bridged program line), two monitor speakers unmuted (left and right for lobby), six monitor speakers muted (left and right for studios A & B & Control Room), two studio intercom outputs (Studio A, Studio B).

### AUXILIARY INPUT/OUTPUT CIRCUITS SWITCHED THROUGH CONSOLE:

Inputs: AM-Automation, FM-Left automation (mono), FM-right automation (stereo), programming for SCA-41 kHz. Output: Programming for SCA-41 kHz.

### IMPEDANCES:

Microphones: 30/50 or 150/250 ohms balanced. Turntable/Tape: 150/250 ohms unbalanced. Network/Remote: 500/600 ohms balanced. Audition Output: 600 ohms balanced.

### MONITOR OUTPUT:

8 ohms nominal, for use as follows:  
 A. Single 8 ohms speaker.  
 B. Two 16 ohm speakers in parallel.  
 C. Up to six 48 ohm speakers (using the 48/8 ohm transformer supplied in parallel).  
 D. Any combination of speakers and/or transformers with a resultant network of 8 ohms or higher.

### GAIN:

Microphone to Line: 100 dB, ±2 dB.  
 Medium Level to Line: 60 dB, ±2 dB.

### RESPONSE:

Program and Monitor: ±1.0 dB, 20 Hz to 20 kHz.

### DISTORTION:

Program Circuits: 0.5% maximum, 20 Hz to 20 kHz @ +18 dBm.  
 Monitor Circuits: 1.0% maximum, 20 Hz to 20 kHz @ +40 dBm (10 watts).

### NOISE:

Program Circuits: 74 dBm below +18 dBm with -50 dBm input (-124 dBm equivalent input noise measured 20 Hz to 20 kHz). Monitor Circuits: 74 dBm below +40 dBm with -50 dBm input (-124 dBm equivalent input noise measured 20 Hz to 20 kHz). Medium Level Inputs: (program) 74 dB below +18 dBm.

### FINISH:

Satin anodized aluminum panels with lettering in black. Cabinet color, two-tone beige-gray.

### POWER:

117 volts, 50/60 Hz, single-phase.

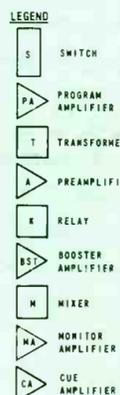
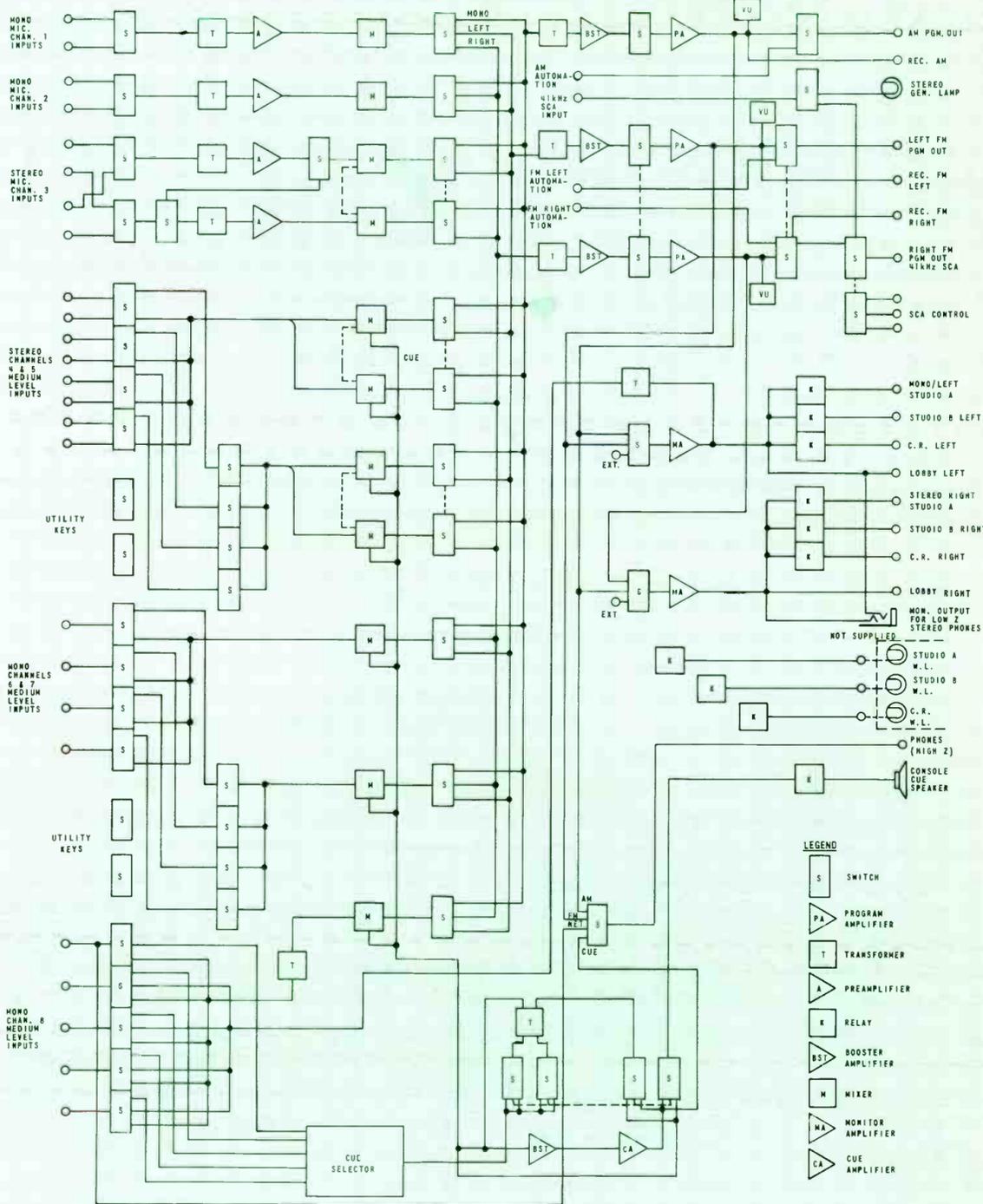
### SHIPPING DATA:

Packed weight: Domestic 140 lbs. Export 220 lbs. Cubage 16 cu. ft.

### MECHANICAL SIZE:

51 3/4" wide, 17" deep, 11 1/2" high.

## Block Diagram



## ORDERING INFORMATION

Dualux II, eight channel mono/stereo console for tri-channel operation. Complete with four M-6549A preamplifiers, six M-6550A program/monitor/cue output modules (interchangeable), two M-6553 and M-6553A solid state muting modules, and M-6551 and M-6552 power supply modules, and M-6556B transformer panel ..... 994-6542-001



GATES RADIO COMPANY • QUINCY, ILLINOIS • 62301 • U.S.A.  
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# DUALUX II

## EIGHT CHANNEL TRANSISTOR AUDIO CONTROL CONSOLE

**DUAL CHANNEL WITH STEREO:** With its capabilities for extensive mixing and switching, the Gates solid state Dualux II is ideal for the broadcaster who wants to control AM, and FM, FM stereo and SCA from one control point during all or part of the broadcast day.

Monophonic or stereophonic mixing can be done independently or simultaneously. Simplified control of any mode of broadcasting is achieved through the Dualux II's exclusive program output selector. An interlocking system guards against the programming of any unacceptable combinations.

**WIDE CHOICE OF INPUTS:** Twenty-two audio inputs can be fed to the Dualux II. These include: thirteen monophonic sources, six stereo sources, automatic programming equipment and an SCA channel. Four unwired utility keys allow addition of sources of your choice.

**MICROPHONE CHANNELS (1, 2, & 3):** Four single monophonic microphones can be individually switched to channels 1 & 2. Either of two stereo microphone pairs can be mixed on channel 3 and a switch is provided to combine the output during monophonic only broadcasting.

**MEDIUM LEVEL CHANNELS (4, 5, 6, 7, & 8):** Channels 4 and 5 will each mix four stereo sources, while channels 6 & 7 each will mix four monophonic sources. These sources can be cartridge tape machines, reel-to-reel tapes or turntables.

Channel 8 will mix four remote inputs and has a network input. Cueing is provided on all medium level channels.

**POSITIVE MIXING CONTROL:** Low impedance ladder step type attenuators are used in the minimum loss mixing circuits. Large "feel of the board" VA control knobs are used to make mixing more efficient. An illuminated key selector above each of the mixing knobs selects the mixer output to AM or FM. Center position is off. Color inserts are provided for all mixer knobs to aid in identification.

**MONITORING:** The Dualux has two solid state monitoring amplifiers for both stereo and mono monitoring. Monitoring outputs are for control rooms, Studio A, B, and lobby. Cue intercom connections are provided to Studio A and B.

**SOLID STATE MUTING:** The Dualux II has Gates' new "Micro-muting" which silences loudspeakers in microseconds.

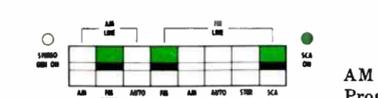
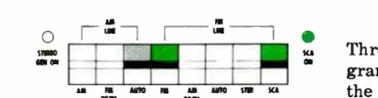
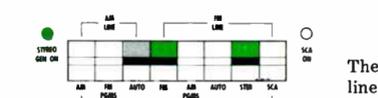
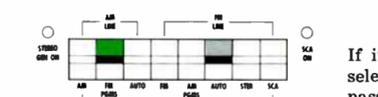
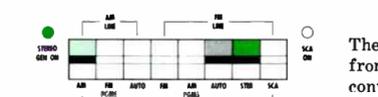
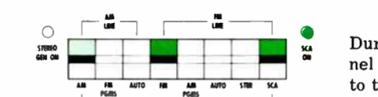
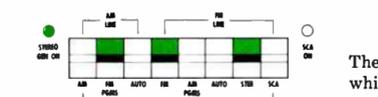
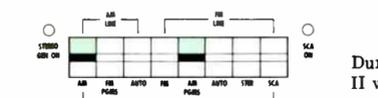
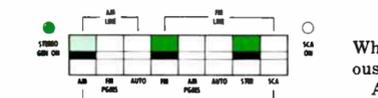
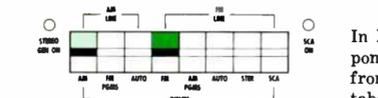
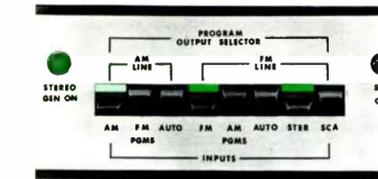
**UNSURPASSED AUDIO:** Gates new advanced all solid state plug-in amplifiers are one of the many sons for the excellence of the Dualux II. Their performance is outstanding.

Audio response is excellent, distortion at an unsurpassed low level. Consequently, the Dualux II provides audio quality which makes it the perfect console for any type of broadcasting—AM, FM, or FM Stereo/SCA.

**MODULAR CONSTRUCTION:** All amplifiers are packaged in extruded aluminum housings and use plug-in connections. All components are mounted on circuit boards and etched wiring is used to add reliability and contribute to the excellent distortion and noise specifications of the console. Silicon transistors are used to assure optimum console performance over a wide ambient temperature range. All amplifiers are completely accessible when the top of the console is opened, simplifying maintenance.

**INTERCHANGEABILITY:** Program, cueing, and monitor amplifiers all have the same electrical design and construction and are completely interchangeable. As a result, three backup program amplifiers are provided as part of the console.

**HIGH LEVEL, HIGH FIDELITY OUTPUT:** The 40 dB gain preamplifiers have exceptionally high input and output level handling capabilities to accommodate microphone levels from -77 to -17 dBm without overload or distortion. The program amplifiers deliver +32 dBm output and the monitor amplifiers +40 dBm, all with unsurpassed frequency response, low distortion and low noise.



### EXCLUSIVE PROGRAM OUTPUT SELECTOR

The versatility of this console is further aided by this exclusive selector network. It enables control of virtually any mode of programming.

#### MODE 1—SEPARATE AM & FM MONOPHONIC

In Mode 1, the AM transmitter is programmed from any mixing channel, when corresponding keys are operated to the left. Similarly, the FM transmitter is programmed from the FM bus. During this nonstereo period, only the Green "AM" and Red "FM" tabs are selected.

#### MODE 2—AM MONO WITH SEPARATE FM STEREO

While programming monophonic material to the AM audience, Dualux II can simultaneously broadcast a completely independent stereophonic program for FM. A red status lamp indicates that FM is programmed in stereo.

#### MODE 3—COMBINED PROGRAMMING FROM AM

During periods when programming may be duplicated on both AM and FM, the Dualux II will "follow" either primary bus to both transmitter lines.

#### MODE 4—COMBINED PROGRAMMING FROM FM STEREO

The broadcaster may wish to program stereophonic entertainment to the FM audience while, at the same time, duplicating the broadcast on AM monophonically.

#### MODE 5—SEPARATE PROGRAMMING WITH SCA

During non-stereo periods, and no matter what source is selected for AM or main channel FM programming, the Dualux II will automatically route an external audio signal to the FM transmitter, and activate the 41 kHz SCA channel. A red warning light shows when this SCA channel is in service.

#### MODE 6—LIVE AM, FM STEREO AUTOMATION

The Dualux II also provides flexibility for programming the AM or FM transmitters from external automatic programming equipment. In this situation, AM is programmed conventionally through the console, and the FM transmitter is broadcasting stereophonically from automation equipment.

#### MODE 7—COMBINED AM & FM FROM AUTOMATION

If it is desired to automate completely during a portion of the broadcast day, simply select both AM Line Output and FM Line Output to "Auto". The Dualux II is then bypassed and external automation system(s) may program the transmitters.

#### MODE 8—FM STEREO WITH AM AUTOMATION

The engineer may devote full attention to FM Stereo broadcasts. The AM transmitter line is carrying prerecorded programming from automation equipment.

#### MODE 9—AM AUTO, FM MONO, AND SCA

Three simultaneous audio signals can be processed by the versatile Dualux II. AM programs are originating from an external programming source. FM programming is from the normal console inputs with monophonic sources, or stereo material combined to feed the FM line. External service feeds the 41 kHz SCA channel of the FM transmitter.

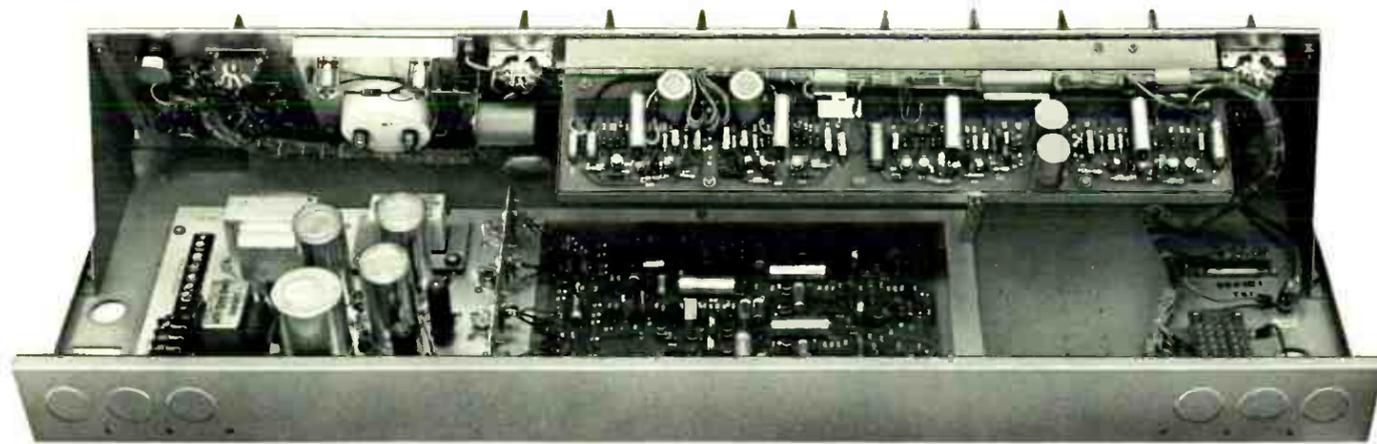
#### MODE 10—COMBINED PROGRAMMING WITH SCA

AM duplicates the FM broadcast. The FM SCA may be operating, as it is activated by Program Output Selector tab.



Solid Statesman Line

... from the Exclusive **GATES** Solid Statesman Line



Complete access to all components is via the easily removed cover of the Yard II. All input and output connections can be made through the rear or the bottom of the console. Convenient knock-outs on the rear apron provide entry for wiring cables.

## Specifications

### GENERAL

**MIXING CHANNELS:** Total of eight, all monaural. Two microphone, five medium level, one network/remote.

**AMPLIFIERS PROVIDED:** Two preamplifiers, two booster amplifiers, one program amplifier, one monitor amplifier, and one cue amplifier.

**OPERATING MODE:** Monaural.

**INPUT CIRCUITS:** Four for microphones, two for turntables, two for tape, one utility, three for network/remote.

**OUTPUT LINES:** One program, two muted speaker, one non-muted speaker, one cue speaker (muted), two headphone (monitor and cue).

### MICROPHONE (CH. 1 & 2) TO PROGRAM LINE OUT

**MAXIMUM GAIN:** 103 ± 2 dB.

**FREQUENCY RESPONSE:** ±1 dB, 30 to 15,000 Hz.

**DISTORTION:** Less than 0.75%, 30 to 15,000 Hz, at +18 dBm output.

**NOISE:** More than 73 dB below +18 dBm output with -50 dBm input. Equivalent input noise is better than -123 dBm, 30 to 15,000 Hz.

**CROSSTALK:** Below noise level, with normal levels and control settings.

**MICROPHONE IMPEDANCE:** 30/50 or 150/250 ohms, balanced.

### MEDIUM LEVEL (CH. 3-7) TO PROGRAM LINE OUT

**MAXIMUM GAIN:** 63 ± 2 dB.

**FREQUENCY RESPONSE:** ±1 dB, 30 to 15,000 Hz.

**DISTORTION:** Less than 0.75%, 30 to 15,000 Hz at +18 dBm output.

**NOISE:** More than 73 dB below +18 dBm output with -10 dBm input, 30 to 15,000 Hz.

**CROSSTALK:** Below noise level, with normal levels and control settings.

**INPUT IMPEDANCE:** 150 ohms, unbalanced.

### NETWORK/REMOTES (CH. 8) TO PROGRAM LINE OUT

**MAXIMUM GAIN:** 43 ± 2 dB.

**FREQUENCY RESPONSE:** ±1 dB, 30-15,000 Hz.

**DISTORTION:** Less than 0.75%, 30 to 15,000 Hz at +18 dBm output.

**NOISE:** More than 73 dB below +18 dBm output with +10 dBm input, 30 to 15,000 Hz.

**CROSSTALK:** Below noise level, with normal levels and control settings.

**INPUT IMPEDANCE:** 600 ohms, balanced.

### MONITOR CIRCUITS

\***GAIN:** Mic. - Pgm. - Mon. Out 124 ± 2 dB

Mic. - Aud. - Mon. Out 106 ± 2 dB

Med. - Aud. - Mon. Out 66 ± 2 dB

Ext. Mon. - Mon. Out 46 ± 2 dB

\*Approximately 11 dB additional gain is available by shorting out the R37, 10,000 ohm resistor, connected between the Monitor Selector Switch and the Monitor Gain control.

**FREQUENCY RESPONSE:** ±1 dB, 30 to 15,000 Hz.

**DISTORTION:** Less than 1%, 30 to 15,000 Hz at +40 dBm (10 watts) output.

**NOISE:** More than 73 dB below +40 dBm (10 watts) output, 30 to 15,000 Hz.

**CROSSTALK:** Below noise level, with normal levels and control settings.

### POWER REQUIREMENTS

**LINE VOLTAGE AND FREQUENCY:** 117V (as shipped) / 234V, 50/60 Hz.

**POWER CONSUMPTION:** 60 watts, maximum.

### PHYSICAL SIZE

**CONSOLE:** 38" wide, 13" deep, 8½" high.

**CONSOLE WEIGHT:** 54 lbs.

**POWER TRANSFORMER:** Approximately 6½" long x 4" wide x 3½" high.

## ORDERING INFORMATION

Yard II Audio Console complete ..... 994-6616



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# YARD II

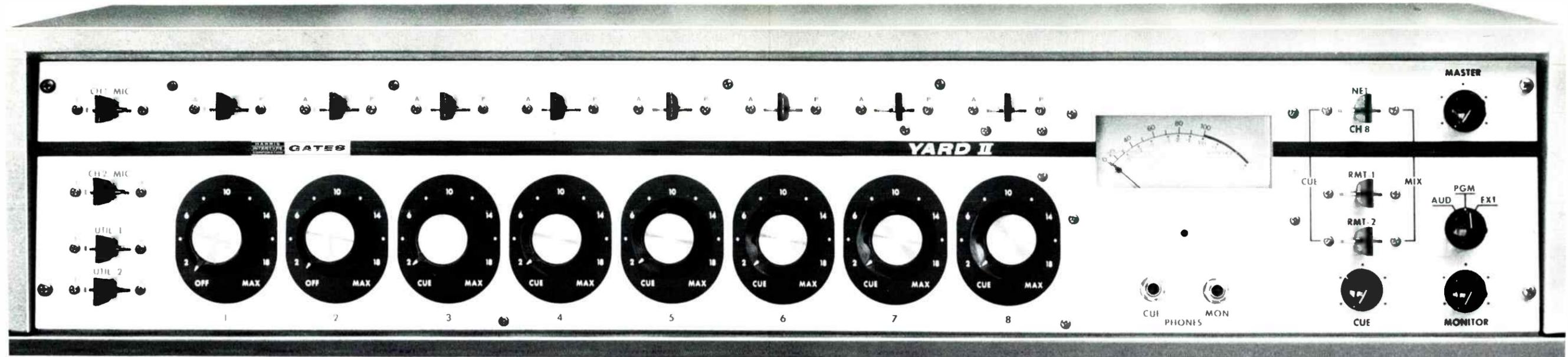
## EIGHT CHANNEL TRANSISTOR MONOPHONIC AUDIO CONSOLE



## features:

- Eight Mixing Channels—12 inputs.
- High Fidelity Performance—extremely low noise.
- Crosstalk below measurable noise levels.
- Built-in Cue Amplifier and speaker.
- Low Silhouette Styling.
- Independent Channel Monitoring and Recording.
- Complete Accessibility to all components.
- Monitor-Amplifier Built-in.
- Compact and lightweight.
- Total Solid State (Silicon) Design.

# EIGHT CHANNEL TRANSISTOR MONOPHONIC AUDIO CONSOLE



## THE YARD II

Successor to the famous Yard console, the new Yard II now offers even greater versatility with the added reliability of total solid state design. Just over a yard wide, Gates Yard II console offers 12 inputs into 8 mixing channels. It is ideal as a full control facility for smaller AM and FM monophonic stations and a perfect sub-master control or production console in larger operations. The low silhouette styling is a definite "plus" for television use.

Functionally arranged, the eight mixing channels are in the center of the board with the meter to the right, along with master gain controls. Preamplifiers used on microphone channels 1 and 2 may select from two low impedance microphones on each input. Five medium level channels can be used with any sources, such as turntables, tape recorders, etc. The eighth channel is specifically designed for use with network and two remote sources, and separate front panel switches provide selection of any of these inputs.

**INDEPENDENT CHANNEL MONITORING AND RECORDING:** Any of the 8 input channels may be switched to either the program or audition position to permit independent monitoring or recording of any incoming sources without disturbing programming.

**HIGH FIDELITY PERFORMANCE:** Frequency response of the Yard II is uniform  $\pm 1$  dB from 30 to 15,000 Hz. Noise is better than 73 dB below normal output with crosstalk below the noise at normal levels and control settings. Distortion is less than 0.75% from 30 to 15,000 Hz at a +18 dBm output.

**VU METER:** A four-inch illuminated 'B' scale VU meter is flush mounted with the Yard II front panel for accurate level measurement.

**LOW SILHOUETTE STYLING:** Only 8½ inches high, the Yard II offers an excellent over the top view, especially adaptable for TV operation.

**ACCESSIBILITY:** All components can be quickly reached through the lift off top. The entire console is hinged at the rear for complete access to the under side of the console.

**INPUTS:** Four microphones, five medium level inputs, and three external line inputs. Cue bus is connected to mixers 3 through 8 to provide rapid cueing on all six channels.

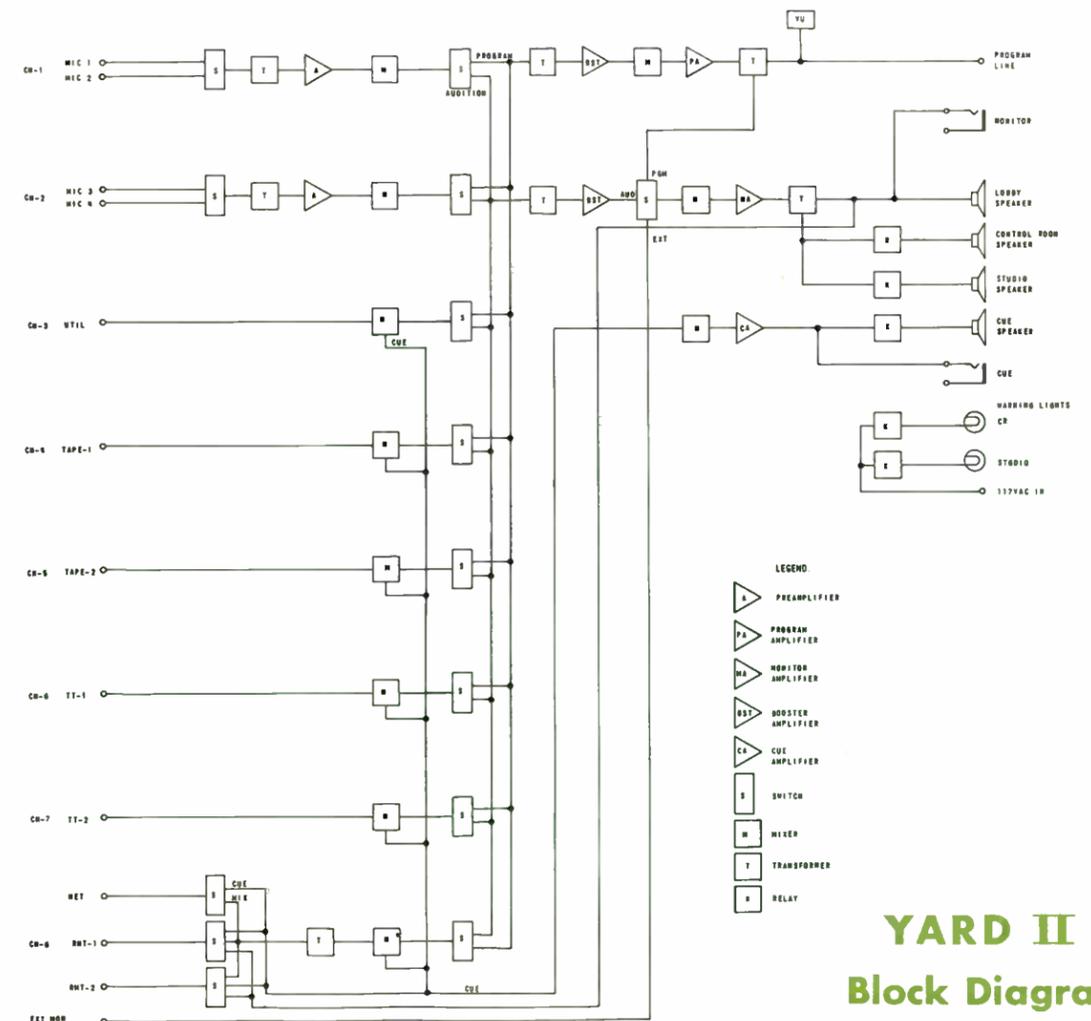
**CUE AMPLIFIER:** Built-in cue speaker in the top of the console provides cue from channels 3 through 8 to either the speaker built into the console or through the separate cue headphone jack.

**BOOSTER AMPLIFIER:** A monitor booster amplifier is provided as standard equipment to allow switching the monitor amplifier from program to audition without changing level.

**MUTING RELAYS:** Two muting relays are supplied to operate warning lights as well as muting of the control room and studio speakers. A terminal strip on the console permits flexible selection of muting relay operation by simply changing jumper wires.

**COLOR CODED CONTROLS:** Mixer knobs are supplied with various colored disc inserts to color code controls such as red for turntables, green for studio A, etc.

**COMPACT AND LIGHTWEIGHT:** The 38" Yard II console is one of the most compact, full facility consoles ever produced. It measures 38" wide, 8½" high, and 13" deep, and weighs only 54 pounds.



**YARD II**  
Block Diagram

# STUDIOETTE 80

## Transistor Console

### SPECIFICATIONS

**MIXING CHANNELS:** Total 4. Key selected to program or audition bus. Channels 1 and 2 for microphones, 3 and 4 for multi-input use such as turntables, tapes, etc. Cue position on faders 3 and 4.

**AMPLIFIERS PROVIDED:** 1 program, 1 monitor, 2 pre-amplifiers.

**OPERATING MODE:** Single channel monaural.

**INPUT CIRCUITS:** 4 microphones, 3 turntables, 2 reel-to-reel and 1 cartridge machine, 2 remote lines, 1 network line. (1 external input for the monitor amplifier).

**OUTPUT LINES:** 1 program, 2 muted speakers, 1 non-muted speaker, 1 cue bus for accessory amplifier/speaker.

**IMPEDANCES:** Microphones—30/50 or 150/250 ohms, balanced; turntable/tape/network/remote — 600 ohms, balanced. Programming output—600 ohms, balanced. Monitor speakers 8 ohms, balanced. Note: where more than 3 loudspeakers are used, see ordering information for additional transformers.

**GAIN: (Maximum)** Microphone input to program line output 100 dB. Turntable/tape/network (medium level) input to program line output 60 dB. All measurements  $\pm 2$  dB.

**RESPONSE:** Program and monitor circuits  $\pm 1$  dB 30 to 15,000 Hz.

**DISTORTION:** Program circuit 1% or less between 30-15,000 Hz at +8 dBm output level. Monitor amplifier 1% or less at 40-15,000 Hz at +40 dBm (10 watts).

**NOISE:** Program circuits: 70 dB or better below +18 dBm output with -50 dBm input (equivalent input noise is -120 dBm).

**MONITOR CIRCUITS:** More than 70 dB below +40 dBm output.

**CROSSTALK:** Less than 10 dB above noise level with normal control gain settings for proper programming.

**POWER:** 117 volts (as shipped)/234 volts, 50/60 Hz. Power consumption: 25 watts maximum.

#### CABINET DATA:

Size: 24" wide, 8" high, 18" deep.

Finish: Front panel—satin natural anodized aluminum with black markings. Cabinet—beige gray with pebble texture.

Weight: 46 lbs. unpacked.

**SHIPPING DATA:** Packed weight: (domestic) 75 lbs.; (export) 120 lbs. Cubage: 5 cubic feet.

### ORDERING INFORMATION

STUDIOETTE 80 transistor audio console .....	994-6769-001
Recommended spare parts kit (100% semi-conductors, fuses, pilot lights) .....	994-6905-001
Isolation transformer .....	478-0009-000
Monitor speaker transformers:	
For one speaker .....	478-0291-000
For three speakers .....	478-0290-000
Cueing amplifier with built-in speaker .....	994-5377-001



QUINCY, ILLINOIS • 62301 • U.S.A.

# GATES



## STUDIOETTE 80

### Transistor

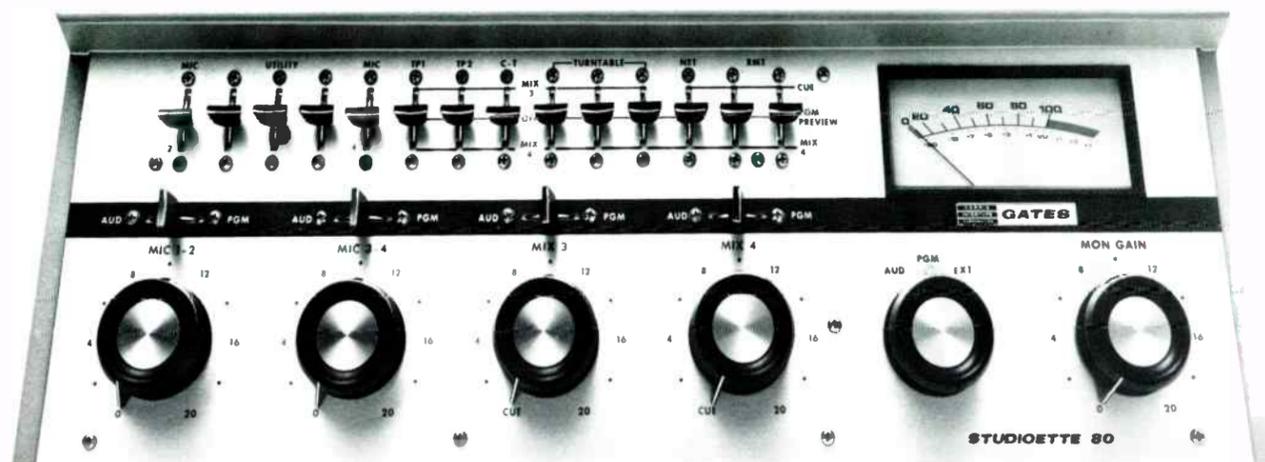
### 4-Channel

### Audio Control

### Console



# STUDIOETTE 80 Solid State Four Channel Audio Control Console



## Features:

- All solid state . . . silicon transistors
- 13 inputs into 4 mixing channels
- Inputs and outputs have isolation transformers
- Faders are the reliable step-type attenuators
- Compact size allows portable operation
- Muting relays have shock mounting for low operating noise
- Hinged top front panel and inner chassis for ease of maintenance

A successor to Gates' famous Studioette, in use in over 1,000 radio stations, the Studioette 80 is a solid-state, four-mixer monophonic console that provides a high degree of flexibility through the use of 13 input selector switches.

Although compact in size, the Studioette 80 offers a wide range of facilities, and is ideal as a main console in medium and smaller size stations. In larger stations, the Studioette 80 will find application as a production console, or may be used for independent programming from a second studio. It is also excellent for use in mobile units and at other remote locations.

**OPERATION:** One of the design objectives in the engineering of the Studioette 80 was to enhance the console's versatility. Although a small console, the Studioette 80 has a great number of input facilities. It provides 4 mixing channels with channel keys and a row of 13 input keys for multiple circuit combinations. Three utility keys are provided for specialized station needs and may be wired into any input. The channel attenuators are high quality step-type controls. Channels 3 and 4 include

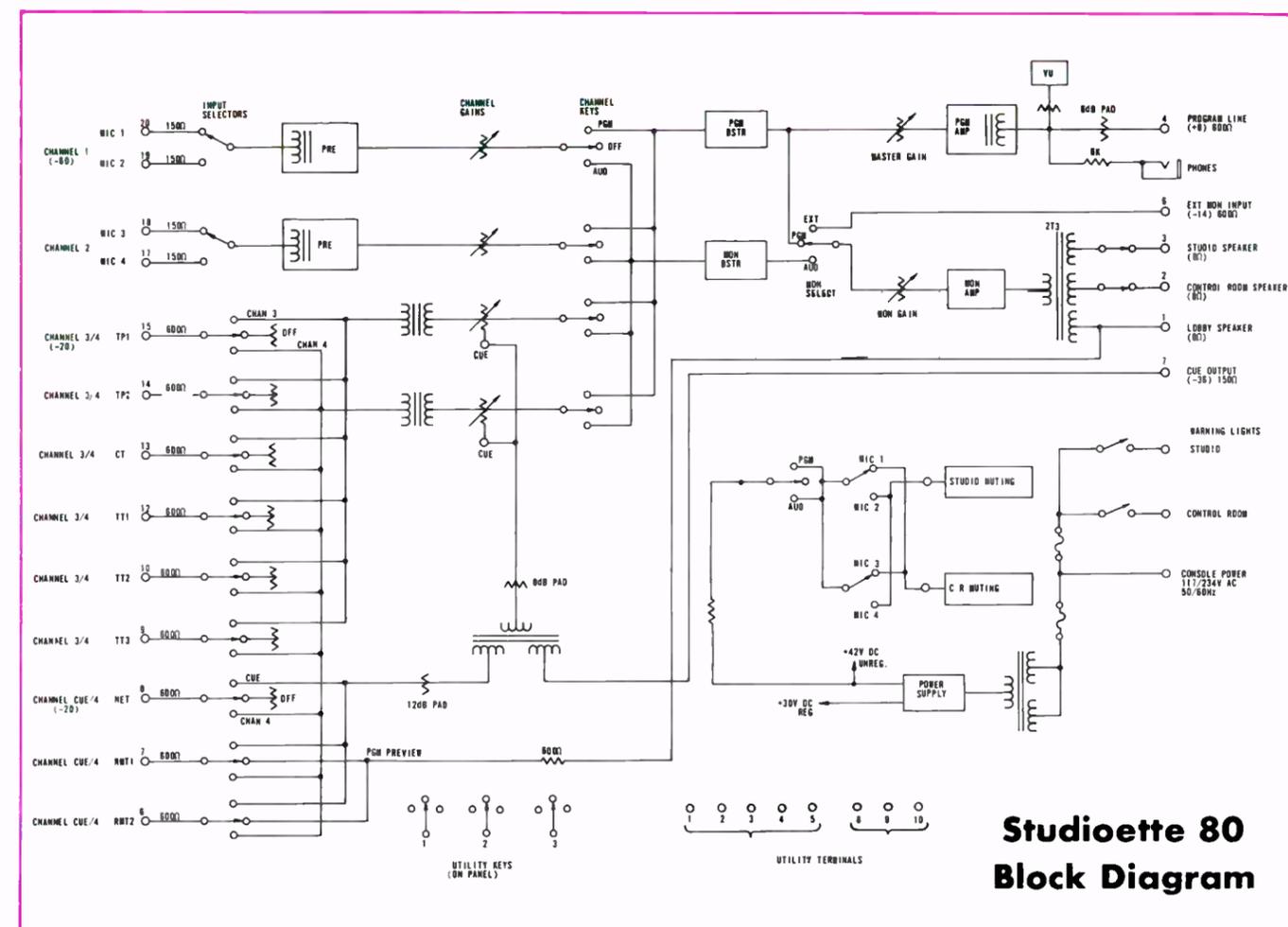
a cue position attenuator. In addition, the inputs and outputs have isolation transformers which prevent ground loops and subsequent system problems.

Four microphones may be key-selected into two preamplifiers. Three turntables, two reel-to-reel and one cartridge machine, two remote lines and network are also accommodated. A 10-watt monitoring amplifier, the same high-quality product found in larger Gates' consoles, is standard equipment.

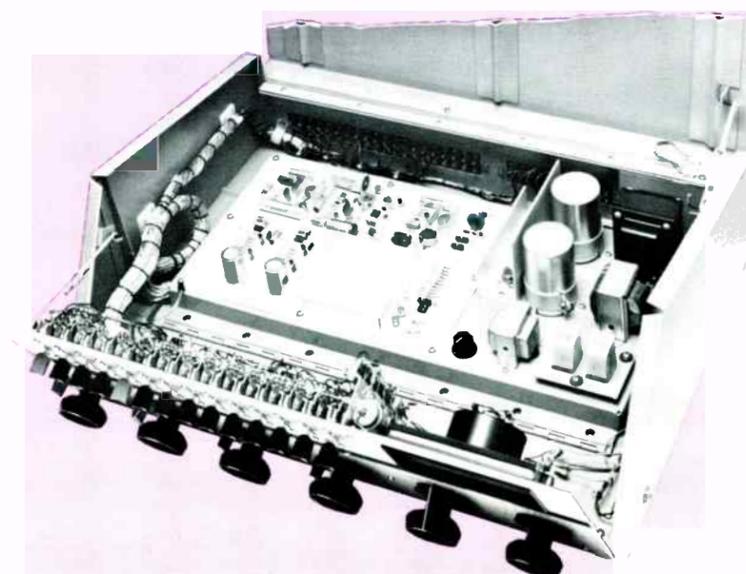
**MUTING SYSTEM:** Dual muting relays handle speaker and warning-light functions. These relays are shock mounted on a sub-chassis to prevent mechanical noise during switching. As a protective feature, warning lights and amplifier circuitry are fused separately. These relays operate in conjunction with the microphone keys and optional muting arrangements are possible with this design.

**ADDITIONAL FACILITIES:** A monitor-selector key switches the monitoring amplifier input to (1) program circuit, (2) terminals for an external source, and (3) audition circuit. A headphone jack is always available across the program line. The 4-inch illuminated VU meter has modern scale and bezel styling. This meter is connected to the program line, indicating +8 VU output at "0" scale reading. A special cueing amplifier/speaker system is available and can be ordered as an accessory item. The Studioette 80 is designed for 117/234 VAC, 50/60 Hz.

**MECHANICAL FEATURES:** Silicon transistors are used throughout the Studioette 80. Mounted in a smartly-styled, all-metal housing, the console is finished in dark-gray pebble texture. The Studioette 80, which features hinged cover and front panel for ease of maintenance, is equipped with specially designed "feel-of-the-board" VA knobs, similar to those used on Gates' larger consoles.



**Studioette 80  
Block Diagram**



Hinged top cover and front panel swing open for easy access to components