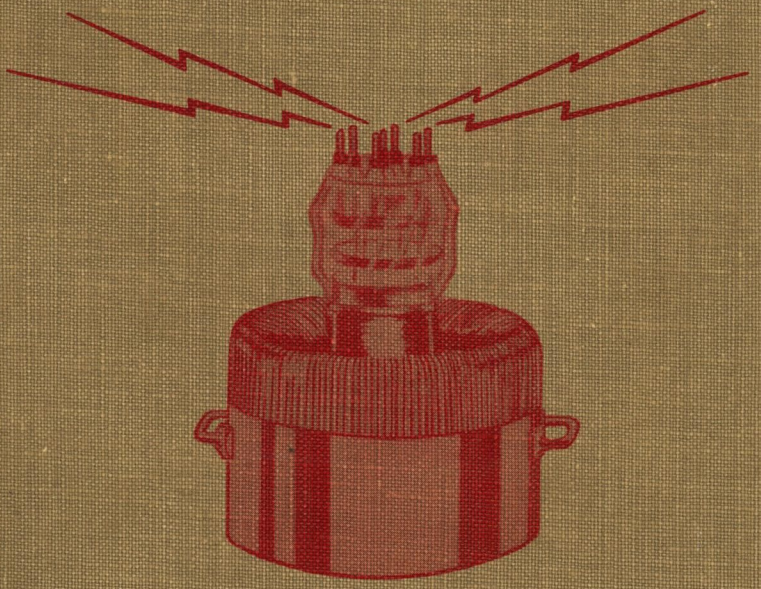
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GENERAL CATALOG

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A Word of Introduction

The equipment listed in this catalog is among the most comprehensive ever offered to the broadcast, communications and associated industries. Gates has prepared this catalog both as an informative book and a buying guide. Though provided to list all major items of manufacture by Gates, this catalog also lists parts and complete equipments manufactured by other reputable companies that have entered into distributing arrangements with Gates. Almost without exception, every item listed is carried in stock at either the main Gates factory and warehouses at Quincy, Illinois, or our various factory warehouse branches.

Our field sales, service and engineering are international in scope. Field sales engineers travel all areas of the United States. In addition to our main sales and engineering offices in Quincy, Illinois, branch offices are in Washington, D. C., Atlanta and Houston. The Atlanta and Houston branches carry a generous inventory of capital equipment as well as service parts. Sales in Canada are handled exclusively by the Canadian Marconi Company with its branches in every major city in Canada. International sales are handled by the international department of the Gates Radio Company, located at 13 E. 40th Street in New York City.

Established in 1922 *and nearing forty years of service, Gates is the senior member in the broadcasting fraternity of many fine manufacturing concerns. — Gates has consistently led in new and progressive designs. — Recognizing quality as of first importance, progressive engineering is backed by a strict manufacturing quality control in one of the world's most modern electronics factories.*

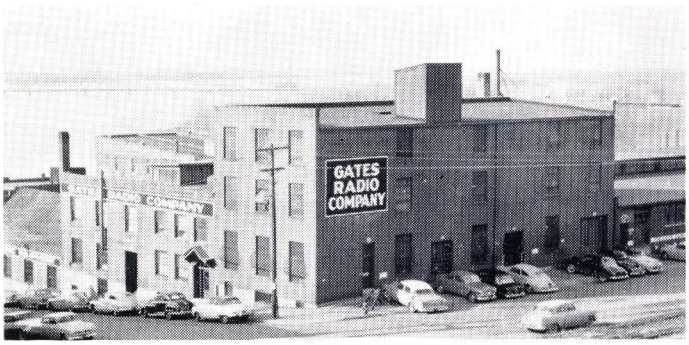
Gates is a member of the Harris-Intertype Corporation family, world leader in the Graphic Arts field. In addition to the two large Gates factories in Quincy, Illinois, this family includes manufacturing plants in Brooklyn, Cleveland, Dayton, Los Angeles, Westerly, R. I., Slough, England and West Berlin, Germany.

If your need is in radio broadcasting, television broadcasting, communications or industrial electronics, we wholeheartedly invite your patronage. Everyone in the Gates organization will do his very best to justify the confidence placed in us.

GATES RADIO COMPANY
SUBSIDIARY OF HARRIS-INTERTYPE CORPORATION

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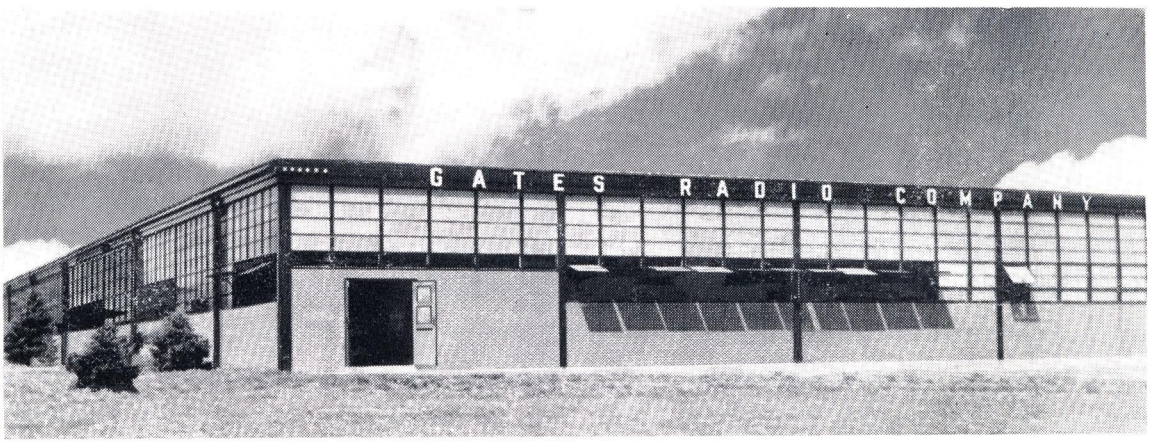
GATES OFFICES and FACTORIES



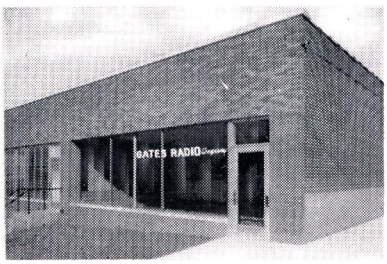
Gates Hampshire Street plant in Quincy, Illinois with 50,000 sq. ft. of manufacturing and administrative office space.



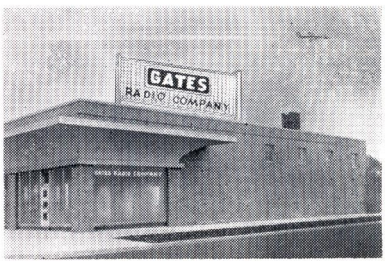
Quincy warehouse of Gates contains 30,000 sq. ft. and is the most strategically located building in Quincy in relation to air, rail and truck shipping.



Modern Broadway plant built by Gates in 1953 is located on a 7-acre tract and considered one of country's finest electronic manufacturing facilities.



Atlanta, Georgia stock carrying branch is located at 1133 Spring Street, N. W., telephone Trinity 6-0369.



Houston, Texas stock carrying branch is located at 2700 Polk Avenue, telephone Capitol 8-8536.

WASHINGTON OFFICE
Complete sales engineering, across from FCC offices, Warner Building, 13th & E Streets, N. W., telephone Metropolitan 8-0522.

THROUGHOUT CANADA
The Canadian Marconi Company, with main office in Montreal and branches in all principal Canadian cities. Telephone Atlantic 9441 in Montreal.

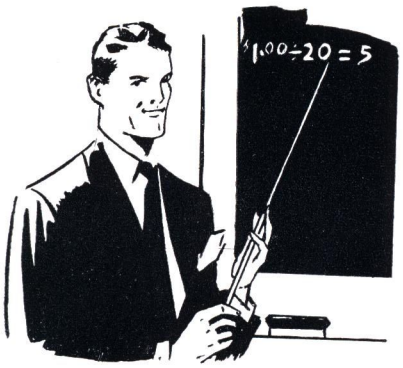
INTERNATIONAL
World-wide sales are conducted by the Gates International Division, 13 East 40th Street, New York City. Cable address ARLAB.

GATES RADIO COMPANY, Quincy, Ill., U. S. A.

Telephone BAldwin 2-8202

A SUBSIDIARY OF HARRIS-INTERTYPE CORPORATION, CLEVELAND, OHIO

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Sales Policy and Terms

(in brief)

GUARANTEE: The Gates guarantee is one of the most liberal in the entire manufacturing industry, a copy of which will be gladly mailed on request. Products listed herein but not manufactured by Gates are subject to the maker's guarantee.

PRICES: Gates sells through its own world-wide sales organization. A one-price policy is maintained. This is the lowest price and any discounts, normally provided, have already been deducted. Every effort is made to purchase at lowest prices and pass these savings on to our customers. Federal Excise Taxes, except in isolated instances, do not apply to broadcasting and communications equipment. In some states and cities, so-called Use Taxes are imposed. Where any tax is imposed, this is additive to the price and is explained as a separate invoice item.

CREDIT: We solicit open account transactions at our regular net 30-day terms. In some instances of urgency and where credit has not been established, shipment will be made C. O. D. Gates also has an excellent time payment plan. Full information is obtainable on request. Credit is only extended within the United States (see export).

SHIPPING: Terms are F. O. B. Quincy, Illinois, except as otherwise noted in the price list. In some instances, to provide faster service, shipment may be made direct from a vendor's factory and in this case terms are F. O. B. vendor's factory.

EXPORT: In Canada, all sales are through the Canadian Marconi Company, with head office in Montreal. Credit terms in Canada are those established by the Canadian Marconi Company. Overseas export sales are usually handled by the International Division, 13 East 40th Street, New York City, or Quincy, Illinois. Payment is either by irrevocable letter of credit or any approved and acceptable method to Gates. Terms are F. O. B. Quincy, Illinois. A small added charge is made for export packaging.

MODIFICATION: Gates reserves the right to modify any item in this catalog without notice where the modification improves the product. If alteration necessitates a price increase, Gates will notify the purchaser prior to shipment. Gates also reserves the right to withdraw any item, listed herein, from sale and without notice.

OTHER CONDITIONS: All orders are subject to final acceptance at our home office in Quincy, Illinois. Items damaged in transit should be called to the attention of the delivering carrier within five days for placement of claim and payment of damages. Gates is proud of its fast delivery policy. Failure to deliver promptly or delays of the transportation company shall not hold Gates liable for damage of any kind, nor shall delays in delivery relieve the purchaser of his obligation of performance.

Terms in any transaction are for the purpose of an understanding. Our objective is to be a fine organization to do business with, with cordial and sincere people and the finest quality we can install in our products.

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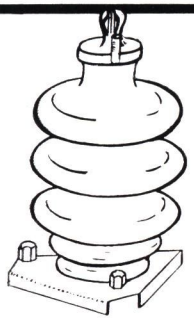
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Gates Model BC-50B 50,000 Watts AM

GATES

MASSIVE POWER



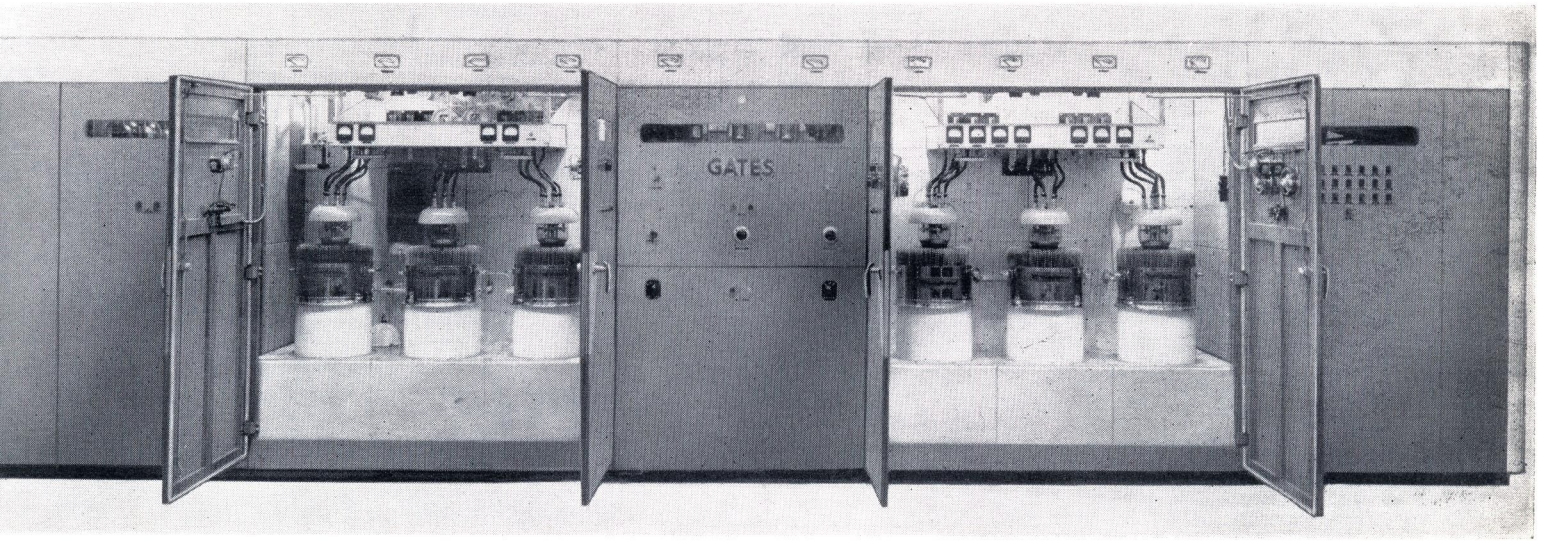
MODEL BC-50B 50,000 WATTS

Because of the conservative approach in design, "massive power" accurately describes this newest of 50 kilowatt AM broadcast transmitters. No effort has been made to make BC-50B the smallest of its kind. Conversely, the generous size, roomy construction permits "massive power". Here is ample room for husky components and the feature every transmitter engineer cherishes, **walk in to service.**

Outstanding is the 100,000 watt capabilities of both the power amplifier and modulator tube complement. This **loaf along** tube complement costs no more and means so much. — Longer tube life is indeed a cost savings that management will more than appreciate. Engineering will enjoy the promise of **on specifications performance** way beyond the normal tube life cycle of older designs.

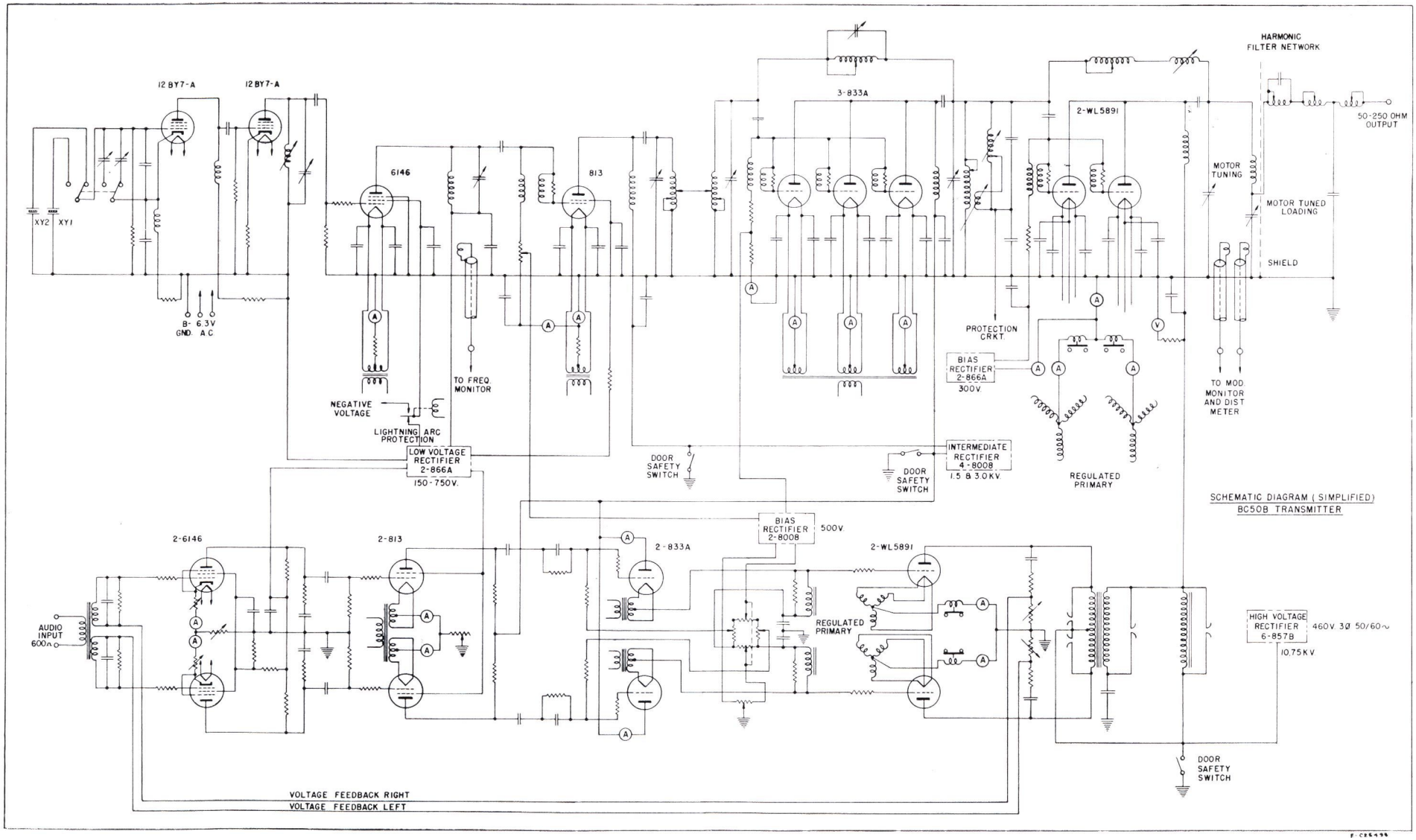
In the Gates BC-50B "massive power" is a combine of 36 years of engineering and manufacturing experience, — a transmitter that exemplifies quality throughout.

(continued)



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SCHEMATIC DIAGRAM OF BC-50B TRANSMITTER. EXTREME DETAIL HAS BEEN OMITTED FOR EASY CIRCUIT IDENTIFICATION.

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GENERAL INFORMATION

(Model BC-50B 50,000 Watts)

Five cubicles or enclosures comprise the main transmitter unit which is 22½' wide, 78" high and 64" deep. Front and back doors are provided for each cubicle. Walk-in-to-service even to mats on the floor and service lights, assures ease of maintenance. Transmitter is beautifully styled in two tones of medium gloss gray with hardware in chrome.

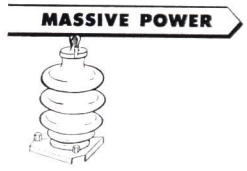
Air circulation is by simple under transmitter ducting. One large, slow speed squirrel cage blower supplies all cooling to each of the cubicles as well as the power tubes. Two small secondary blowers provide an air stream to the base of each rectifier tube.

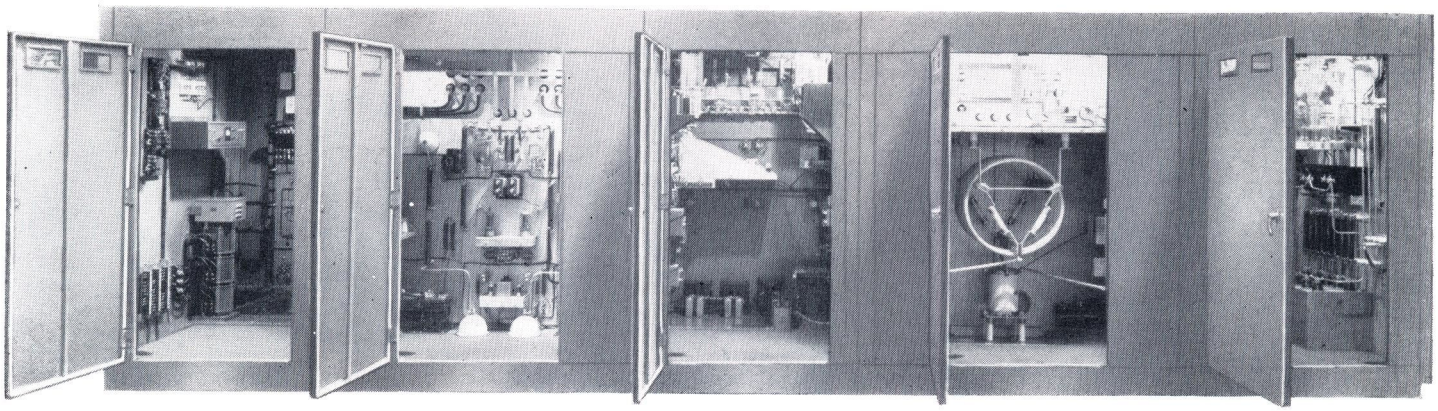
There are 5 radio frequency stages and 4 audio frequency stages. Power and modulator tubes are interchangeable. Vacuum type crystals are employed. Main primary voltage is 460 volts, 3-phase, which has been determined most readily available world-wide. Other primary voltages may be had where desired. There are 22 meters that measure every needed circuit including a filament hour meter. A separate primary contactor cabinet is supplied for secondary location such as near the utilities entrance or blower.

Six externally mounted, oil-filled transformer units include three plate transformers, filter reactor, modulation reactor and modulation transformer. These may be mounted either indoors or outdoors. — A spare tube socket for both PA and modulator allows almost instantaneous change by reason of inbuilt switch-over.

Electrically the Gates BC-50B has incorporated circuits very familiar to broadcasters, with today's modern engineering approach. RF harmonic reduction, lower distortion through both improved circuit and transformer design, construction for low air noise, use of vacuum type crystals and an ultra complete relay control system that permits unattended control — are just a few points where Gates engineers gave months of design attention.

In a field where illustrious names often appear, it becomes obvious that Gates must supply a "Fifty" that, wherever possible, must be ahead of all others. — We confidently feel that no finer 50,000 watt transmitter is available today and the sincerity of purpose by going the extra mile throughout the design could make Gates BC-50B **the best "Fifty"** available anywhere. Fully FCC approved, of course.





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MASSIVE POWER



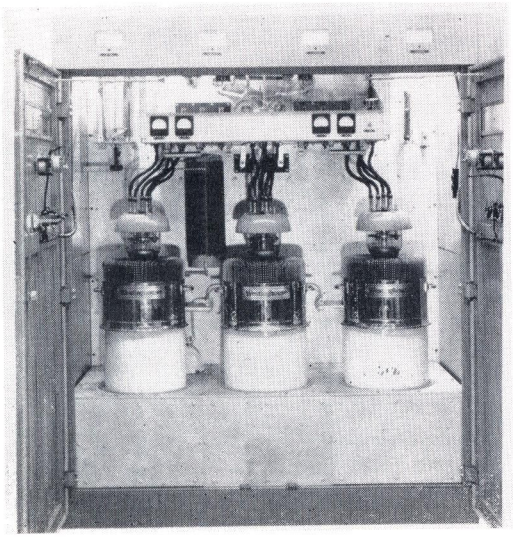
BC-50B RADIO FREQUENCY SECTION

Six RF stages are headed with dual vacuum type crystals requiring no temperature oven or thermometer. Intermediate amplifiers are self-neutralized up to the trio of 833A driver amplifiers. The reliability and proven long life of 833A tubes is well known to all. — The final power amplifier is two 5891 tubes operating single ended. Actual FCC rating of a single 5891 tube is 50KW. The use of two tubes is to permit lower plate voltage and current to each tube to develop both long tube life and even more important, trouble-free operation throughout ultra-conservative design. The third tube, illustrated below, is the spare which may be inserted in the circuit in 10 seconds.

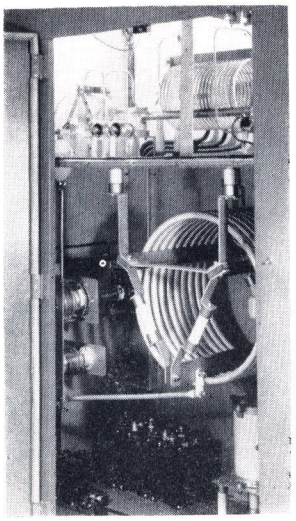
Complete attention has been paid to low harmonic radiation. An extensive Tee and harmonic network is part of the output system. The generous use of edgewise micalex insulated coils, even in lower power stages, signifies studiness and reliability. Illustrated below is the large silver plated tank inductor, a very necessary part in high output efficiency. In power stages, vacuum type capacitors predominate.

Metering is complete to every measurable circuit. Reaching every part in seconds has been a major design goal. **"Walk in to service"** is carried to the point of automatic service lights when the doors are opened and floor mats provided. — Some may say that Gates engineers have gone too far in massive design. The rebuttal is unquestioned superiority of quality.

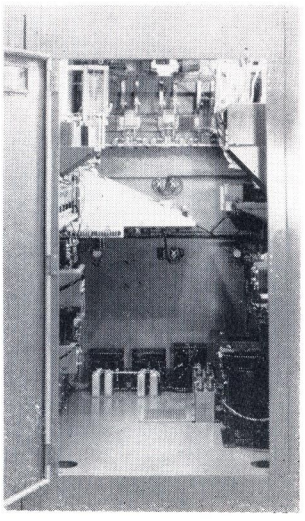
"Massive Power" output tube complement is reached from the front. The third tube is a spare, ready to insert in 10 seconds.



Tank and output coupling system are partially viewed in this rear illustration of the radio frequency section.



This fine view illustrates all power RF stages including the trio of 833A drivers. Note the roomy design. Easy to service?



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BC-50B MODULATOR SECTION

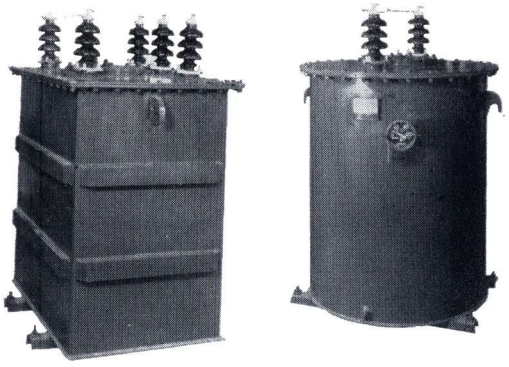
What is quite as desirable as an abundance of modulator power? Ease of modulation automatically results in low carrier shift, better regulation and not strangely — a smoother sounding audio quality. Here again the 100KW capabilities of the modulator tubes provide the big **performance plus.** Here is high level Class B modulation in the finest form where transformer design, cathode follower audio drive and a stable feedback system develop that smoothness in quality that is the result of low distortion and wide response.

There are 4 push-pull audio stages. All audio tube types are identical to those found in the radio frequency section. This interchangeability adds to utility and savings. — Metering leaves no important circuit untouched. Fifteen decibels of feedback is employed to improve the already excellent performance without feedback. Twin 833A audio drivers cathode couple to the modulator grids. Elimination of the driver transformer and coupling capacitors, because of cathode follower, reduces distortion and adds to reliability.

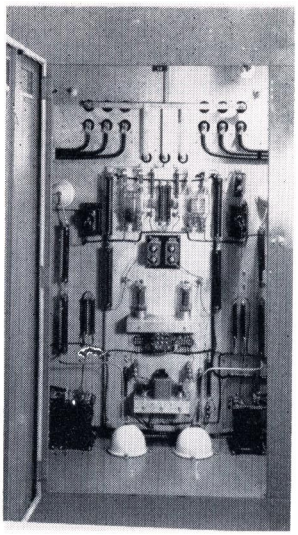
Modulation transformer and reactor have been specially designed. Phase shift at higher frequencies has been reduced to the point that high frequency distortion is low distortion too. Made for Gates by the manufacturer that supplied the transformers for Boulder Dam, nothing has been left undone to give broadcasters the quality that defines **"massive power".**

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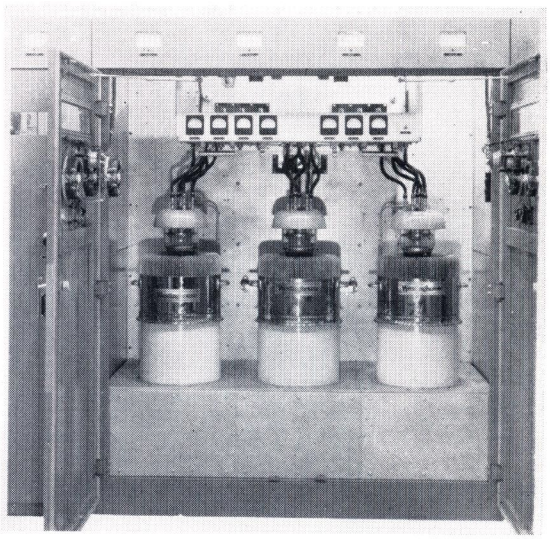
Modulation and reactor transformers are oil-filled and double impregnated, then mounted into gasket sealed steel tanks for indoor or outdoor service.



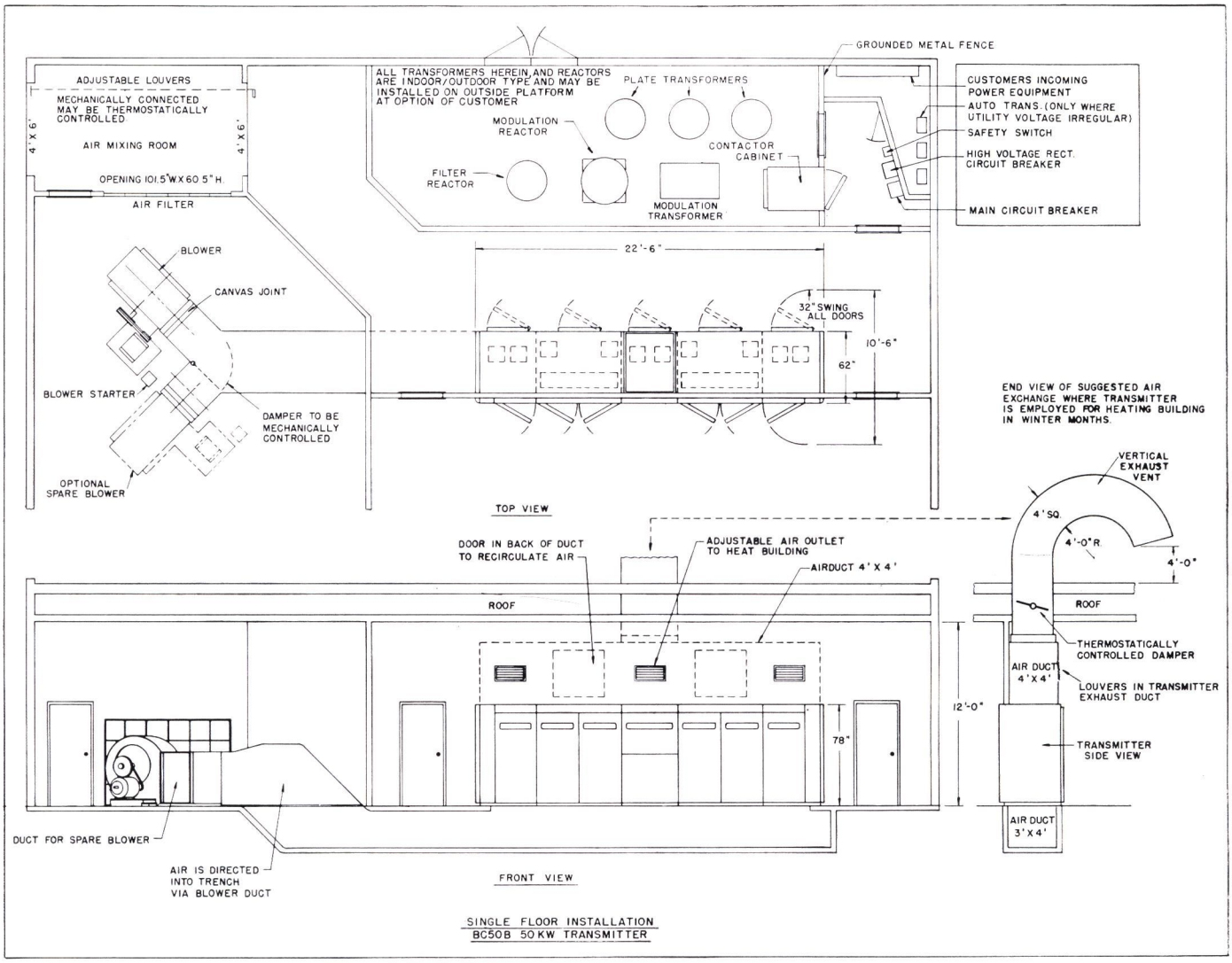
Rear view audio section showing 833A drivers, intermediate power supply and feedback system.



Front of modulator section. Third modulator is optional spare. Note wide, unobstructed access doors and the 11 meters in this section alone.



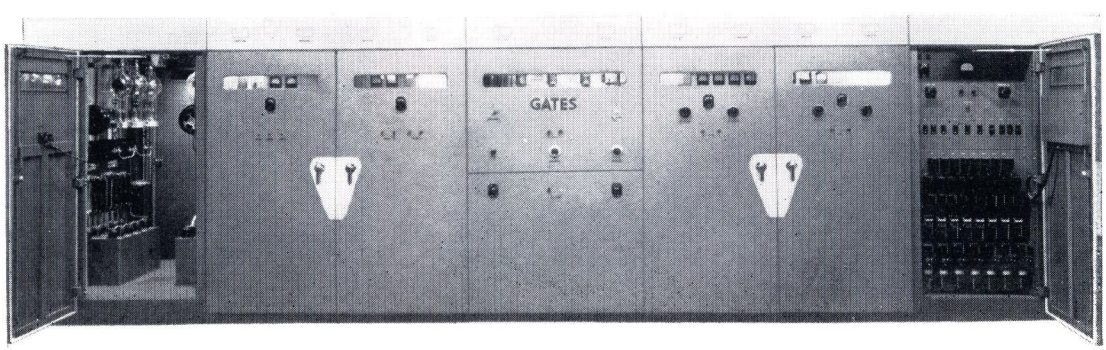
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Model BC-50B

Installation of the 50,000 watt equipment may be made in several excellent and by no means complicated procedures. Drawings on this and the opposite page are suggestions and many alternates are very acceptable.

A one-floor plan sketch is shown above. The transformers and reactors are shown indoors but this space may be conserved by placing them outdoors as these units are of the outdoor type as well. A typical outdoor arrangement is shown at the top of next page. In this arrangement, the main cooling blower

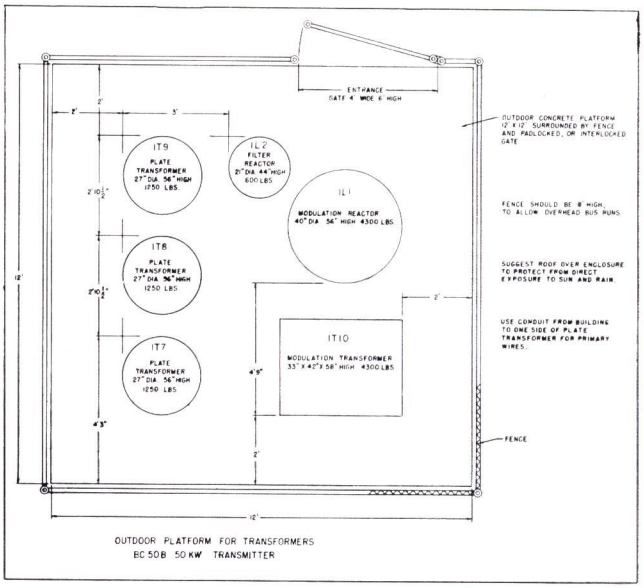


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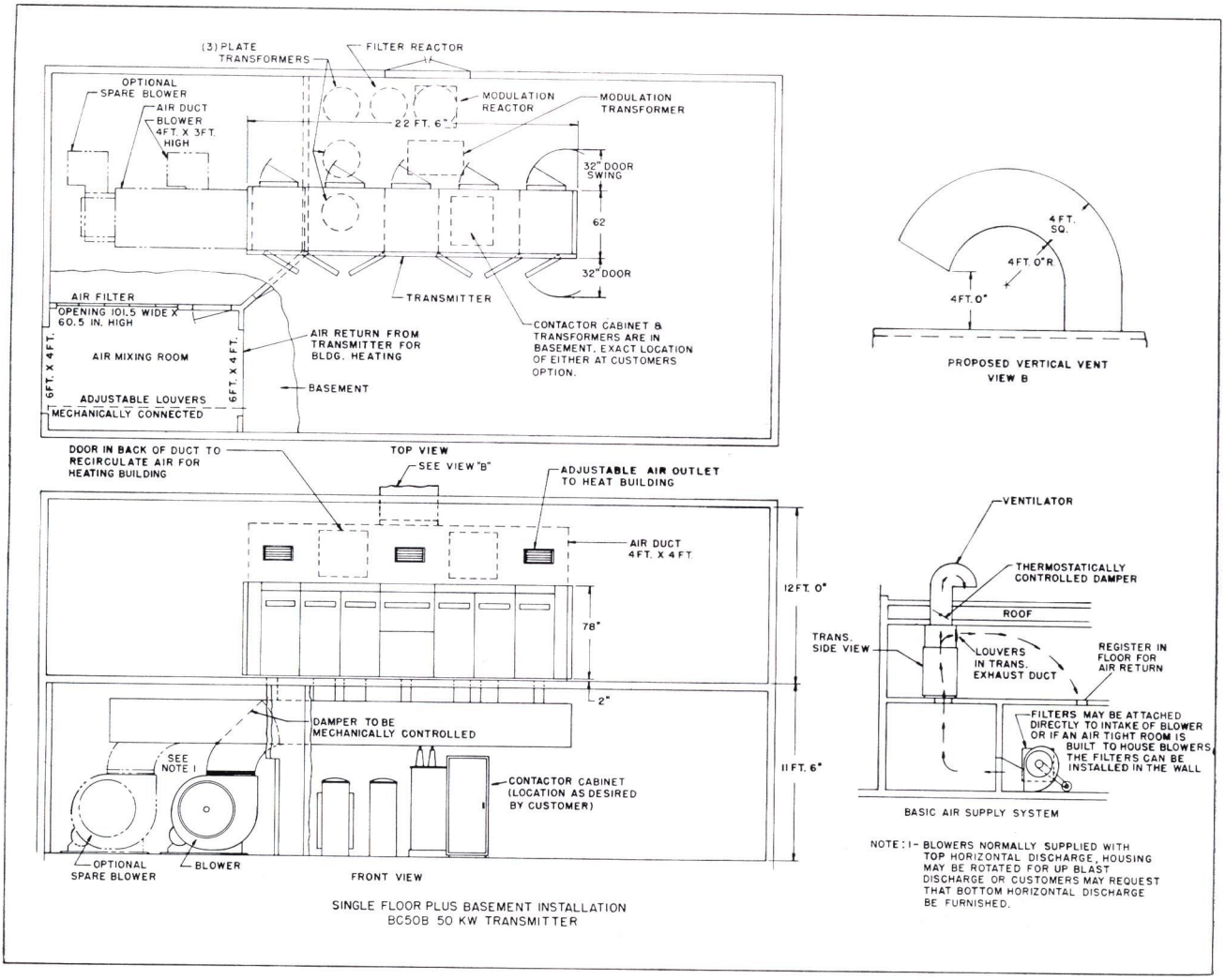
is often placed in a separate room, though by no means mandatory. — Adjustable air outlets have been shown. In winter months the heat normally exhausted during summer months may be employed for building warmth. Approximately 175,000 BTU is available for this purpose.

As BC-50B is 100% air cooled, installation is straightforward and can be speedily accomplished.

In the sketch below, BC-50B is installed in a one-floor-plus basement arrangement. Here the blower and power transformer units are mounted below the transmitter. Obviously this arrangement permits a smaller building area and yet full convenience is enjoyed. — Here again, the heat dissipated through the air cooling system is used for building heat in cold months. Many alternatives to this suggested layout can be easily visualized.



Where main power components are outdoor installed, the above suggested layout calls for a simple concrete platform with cyclone fence, or similar, on all sides.



SINGLE FLOOR PLUS BASEMENT INSTALLATION
BC50B 50 KW TRANSMITTER

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MASSIVE POWER



MODEL BC-50B 50,000 WATT TRANSMITTER

HIGH VOLTAGE RECTIFIER. Six 857B rectifier tubes operate in a 3-phase, full wave system, producing approximately 10.7 KV to the PA and modulator tubes. This long life rectifier tube complement has been proven over a period of years as the lowest cost, trouble-free rectifier system available. The output of the filter reactor has 16½ mfd. of filter for both extremely low noise and marvelous regulation. — The rectifier cubicle is of **walk-in design** from both front and rear. Condenser discharge switches and double safety door interlocks, connected to a most elaborate relay/circuit breaker system, insure personnel safety.

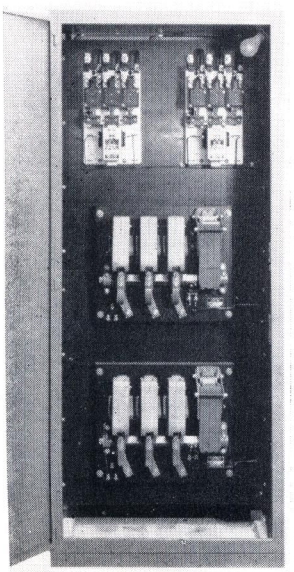
Three oil-filled main plate transformers (one for each phase leg) are provided for reliability. These are usually outdoor mounted but indoor mounting is also very practical. There are two additional lower voltage power supplies plus two bias supplies, all of the reliable time proven tube type.

PROTECTION. At any power, few transmitters are as well protected. The main primary contractor cabinet (illustrated below) contains the plate, start and run contactors interlocked by auxiliary relays in the same cabinet, to the ultra complete protective system, which is the right cubicle of the transmitter enclosure and illustrated below. This cubicle has a non-interlocked front door to reach any protective relay or breaker. 21 status lights, located on the front door, indicate immediately the relay circuit activated.

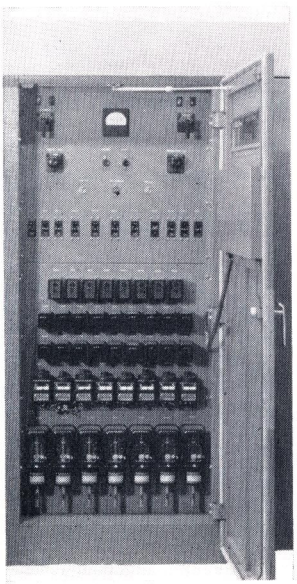
There are 7 major overload relays, 18 intermediate overload relays, 8 time delay relays, 8 auxiliary relays that pilot larger contactors and 11 primary circuit breaker type switches. — This very complete complement can be quickly summarized by stating, "every circuit and every facility, large or small, is 100% protected."

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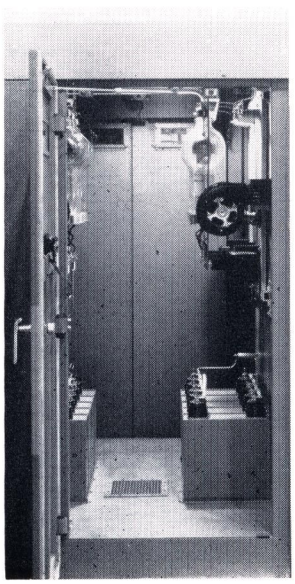
Contactor cabinet is usually installed near the primary entrance and interlocks to the complete BC-50B protective system.



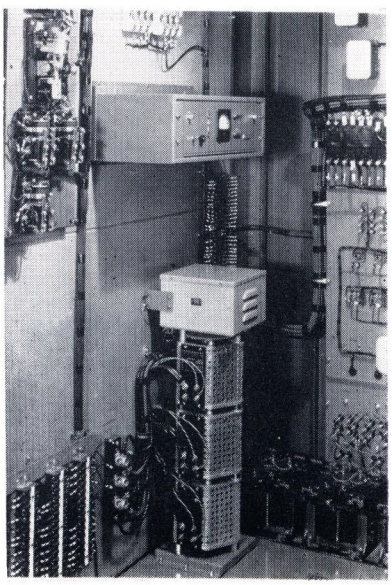
Lifeguard of "massive power" is this most complete protective system which interlocks to every function of the transmitter.



Rear view of HV rectifier cubicle. Long life, trouble-free vacuum tubes are in "walk in to service" surroundings.



Here is a close-up of the electronic filament voltage regulator. Wave form is held perfect by use of an automatic motor driven variable auto transformer.



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MODEL BC-50B 50,000 WATT TRANSMITTER

REGULATION. Under the subject of "High Voltage Rectifier" it was pointed out that 16½ mfd. paralleled the filter output. This provides the great asset of output voltage stability. — Added to this is 100% automatic regulated filament voltage to every tube in the entire transmitter. — A standard Gates 3-phase voltage regulator consists of an electronically controlled motor driven auto transformer, keeping filament voltage within ½% (approximately .05 volts variation on an 11 volt PA filament) at all times.

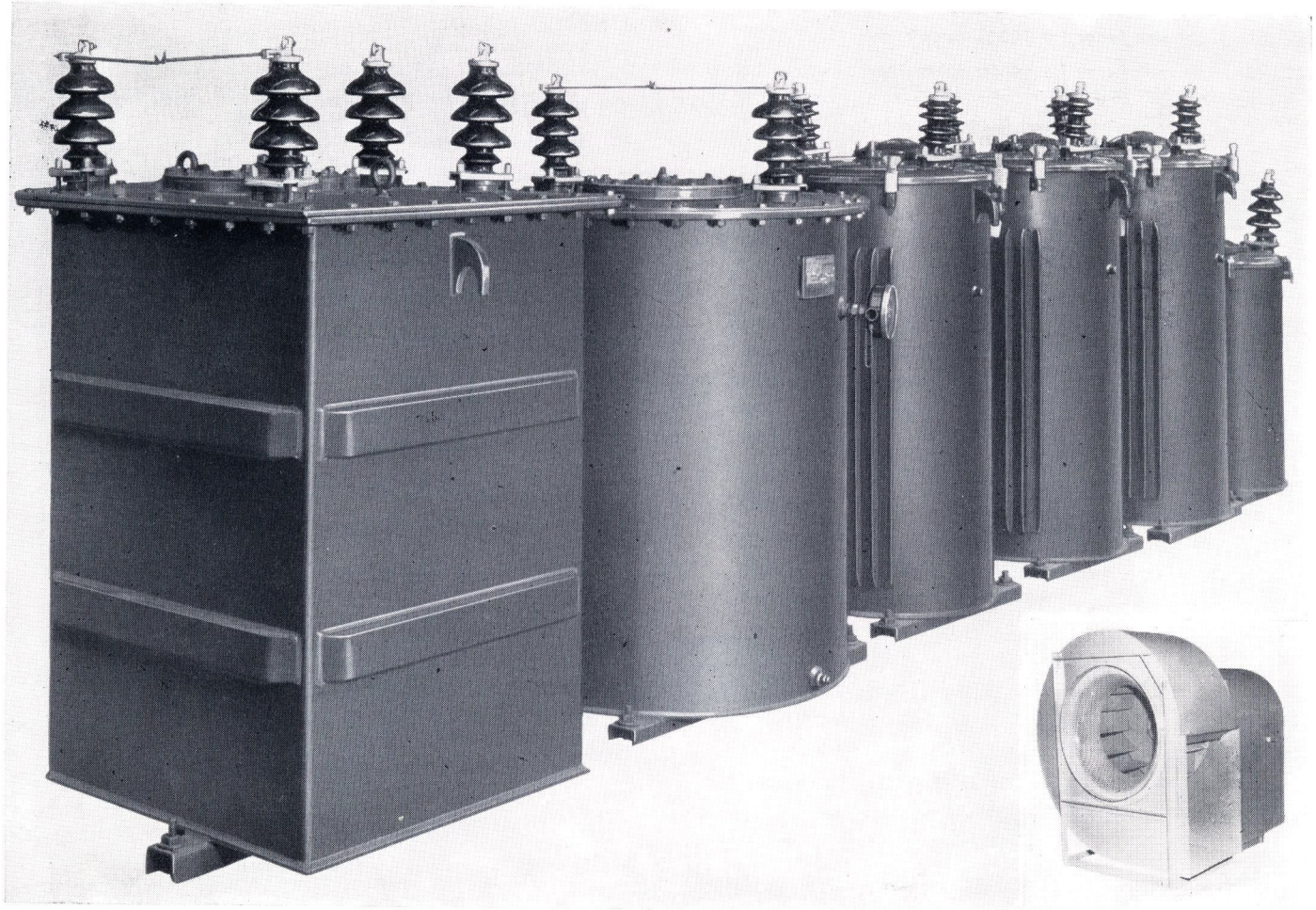
Though any transmitter regardless of power will require adequate primary supply from the utility company, the Gates BC-50B **massive power** design adds to rather than subtracts from regulation. Heavier filter reactors, larger plate transformer design, plus **big design** throughout, assures regulation as an outstanding BC-50B feature.

BLOWER. As BC-50B is 100% air cooled and movement of air is important, not only as to the amount but such important considerations as mechanical and electrical noise, air rush noise and distribution of forced air to the entire transmitter as well as power tubes, the selection of the blower is important.

By use of one large, low speed blower, located remotely (separate room or basement), air rush noise is negligible. Likewise, mechanical noise cannot be converted to low frequency audio noise. Equal distribution of air to every section of the transmitter virtually bathes each part in clean fresh flowing air. Exhaust is then vented out of the building, or in winter a portion is converted to building heat. Engineers in daily attendance to the Gates BC-50B will appreciate and revel in the great amounts of air being moved almost silently.

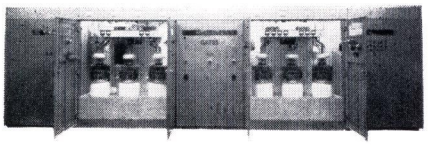
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This rugged backfield of heavy power and modulation components spells reliability and meticulous performance. The blower (inset) supplies up to 14,000 cu. ft. of air per minute. Slow speed assures negligible air rush and quiet performance.



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GATES



BC-50B COMPLETE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

POWER OUTPUT: 53,000 watts.

OUTPUT IMPEDANCE: 40-250 ohms, zero reactance*.

FREQUENCY RANGE: 540-1600 Kc (as ordered).

RF STABILITY: ±10 cycles.

CRYSTAL: Sealed vacuum type, no heater or oven required.

AUDIO DISTORTION: At 95% modulation, less than 3%, 50-75,000 cycles.

FREQUENCY RESPONSE: ±1 db 30-10,000 cycles.

MODULATION: High Level, Class B.

MODULATION CAPABILITY: 100%.

AUDIO INPUT: 600/150 ohms at +10 dbm ±2 db for 100% modulation.

CARRIER SHIFT: Less than 5% at 100% modulation.

CARRIER HUM AND NOISE: 60 db or better below 100% modulation.

RF HARMONIC POWER: 70 db or more below fundamental.

POWER LINE REQUIREMENTS: 460 volts ±5%, 3 phase, 60 cycles**.

POWER INPUT:
Unmodulated: 90.8 KW.
Average modulation: 98 KW.
100% modulation: 133 KW.
Power factor (at 100% modulation): 90%.

RECYCLING: Transmitter may be set for either 1 or 3 automatic resets of carrier before final disconnect.

*** For standard transmission line as ordered.**
**** 50 cycles also available.**

METERING

Individual Meters:

1 ..... Supply bus volts
2 ..... Regulated bus volts
3 ..... Left modulator plate
4 ..... Right modulator plate
5 ..... RF line current
6 ..... PA plate current total
7 ..... Left PA cathode
8 ..... Right PA cathode
9 ..... PA filament voltage (3 legs)
10 ..... Modulator filament voltage (3 legs)
11 ..... First audio cathode (left)
12 ..... First audio cathode (right)
13 ..... Second audio cathode (left)
14 ..... Second audio cathode (right)
15 ..... Third audio cathode (left)
16 ..... Third audio cathode (right)

Multimeter No. 1: By switch selector, oscillator plate, first IPA cathode, second IPA cathode, third IPA cathode No. 1, third IPA cathode No. 2, and third IPA cathode No. 3.

Multimeter No. 2: By switch selector, first IPA grid, second IPA grid and third IPA grid.

TUBE COMPLEMENT

RADIO FREQUENCY SECTION:
12BY7A oscillator.
12BY7A buffer.
6146 first IPA.
813 second IPA.
(3) 833A third IPA.
(2) 5891 power amplifiers.

AUDIO FREQUENCY SECTION:
(2) 6146 first audio.
(2) 813 second audio.
(2) 833A third audio.
(2) 5891 modulators.

RECTIFIER SECTION:
(6) 857B high voltage rectifiers.
(4) 8008 intermediate rectifiers.
(2) 866A low voltage rectifiers.
(2) 866A bias rectifiers (for power amplifier).
(2 8008 audio bias rectifiers.

MECHANICAL SPECIFICATIONS

MAIN TRANSMITTER SECTION:
Total width, 22'6". Total depth, 5'4". Total height, 6'6".

SUB UNITS:
Plate transformers (3): 27" dia., 56" high. Wt. each 1250 lbs.
Filter reactor: 21" dia., 44" high. Wt. 600 lbs.
Modulation transformer: 33" wide, 42" deep, 58" high. Wt. 4300 lbs.
Modulation reactor: 40" dia., 56" high. Wt. 4300 lbs.
Contactor cabinet: 34½" wide, 47½" deep, 78" high. Wt. 600 lbs.

SUPERVISORY CONSOLE AND DESK: 50" wide, 30" deep, 36½" high.

BLOWER: 65" high, 55½" wide, 56 3/8" long.

BLOWER CAPACITY: Adjustable 10,000 to 14,000 cu. ft. minute.

WEIGHTS (unpacked):

Transmitter including contactor cabinet	10,580 lbs.
External transformers	12,950 lbs.
Blower	1,005 lbs.
Control desk (optional)	390 lbs.
Miscellaneous equipment	535 lbs.
Total estimate net weight	25,460 lbs.

WEIGHTS AND CUBAGE (packed):

	Domestic	Export	Cubage
Transmitter including contactor cabinet	14,000	16,500	1116.3
External transformers	13,220	14,200	220.1
Blower	1,600	1,400	176.4
Supervisory control console	495	595	40.2
Miscellaneous equipment	720	1,000	71.5
Total	30,035	33,695	1624.5

NOTE: Weights and cubage are estimates and will vary in accordance with variations of lumber and packing methods. For domestic van shipment, where packing not required, use unpacked weight.

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GATES

BC-50B COMPLETE SPECIFICATIONS

ORDERING DATA

(equipment supplied)

1 Transmitter section including:: (a) left end cubicle, (b) left intermediate cubicle, (c) center cubicle, (d) right intermediate cubicle, (e) right end cubicle.

1 Contactor primary distribution cabinet.

1 Blower and filter equipment.

1 Modulation transformer (oil-filled).

1 Modulation reactor (oil-filled).

3 Plate transformers (oil-filled).

1 Filter reactor (oil-filled).

1 Complete 100% set of tubes.

2 Vacuum crystals.

3 Auto transformers for reduction from 460 to 230, for 3-phase intermediate supplies.

2 Instruction Books.

BC-50B Complete 50KW Transmitter as listed above ..... Cat. M-4946

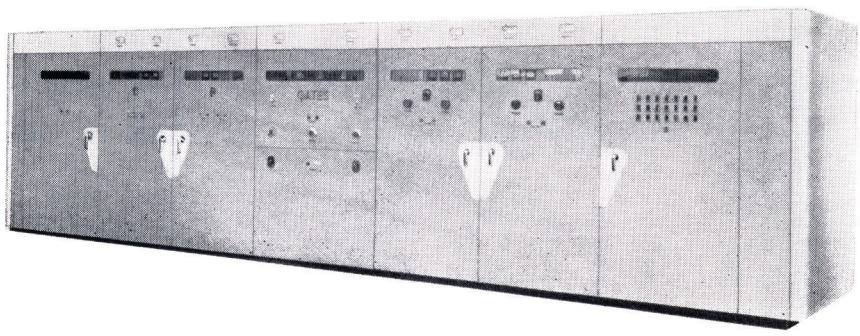
NOTE: BC-50B is supplied as a complete transmitter and no effort has been made to break down the transmitter herein as to individual components which would only be confusing.

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OPTIONAL ACCESSORIES

(ordered where required)

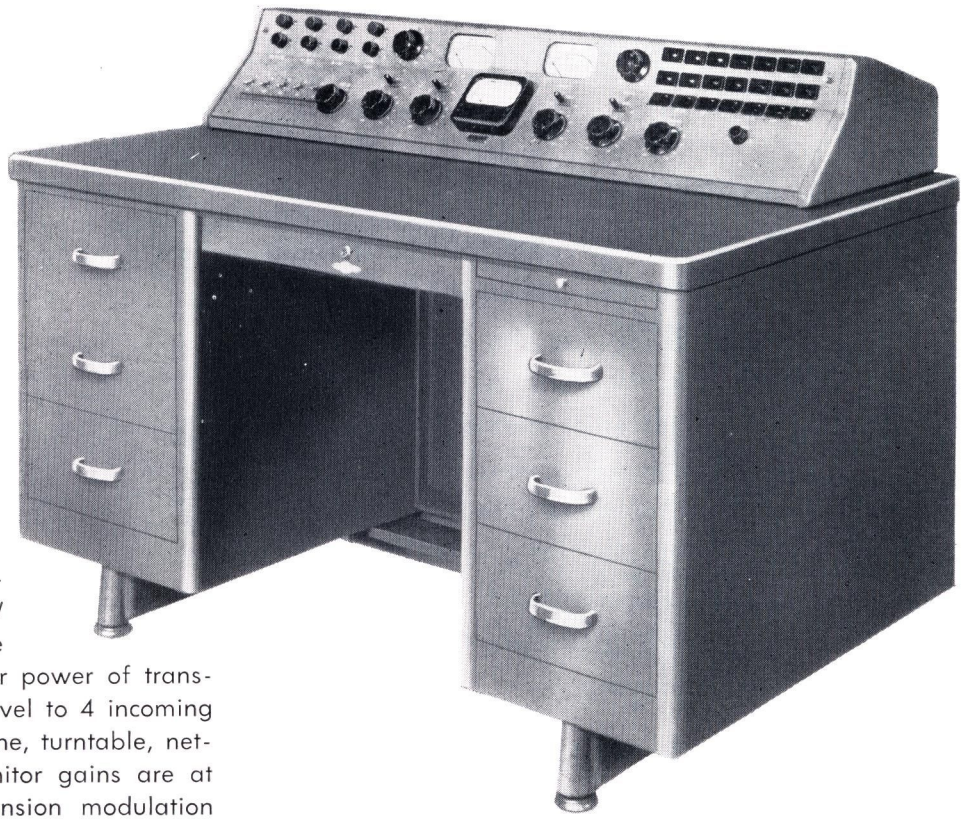
Supervisory control console (next page)	M-5120
100% spare tube set	TK-263
FCC required tube set	TK-264
Spare blower unit	M-5519
Modification kit for 50 cycle operation	M-5520
Single tower antenna coupler to specifications of customer as to frequency, tower height and line impedance	Custom
Phasing equipment, any directional design	Custom
Proof of performance equipment	SA-131
Water cooled dummy antenna	M-5497
Spare parts kit to customer needs	Custom



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GATES

SUPERVISORY CONTROL CONSOLE

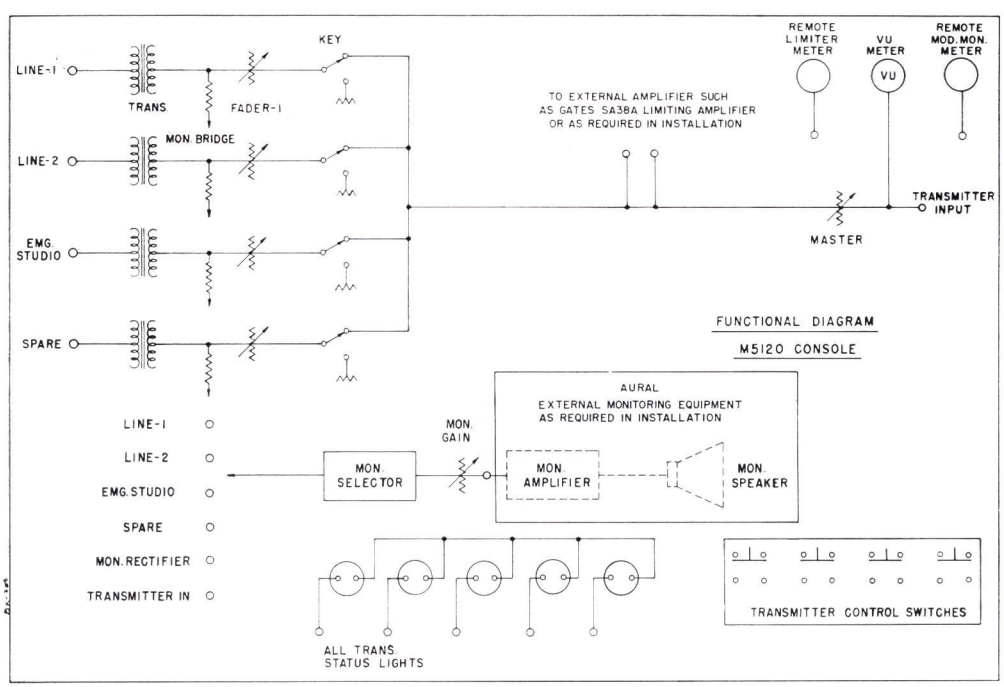


Though designed basically for the BC-50B and BC-100B, 50KW and 100KW transmitters, this very complete console and desk is adaptable to any make or power of transmitter. Four mixing channels adjust level to 4 incoming circuits. These may be lines, microphone, turntable, network or as desired. Master and monitor gains are at finger tips. Meters include VU, extension modulation percentage* and extension limiter**. Status lights, 21 in all, duplicate those on the transmitter. Duplicate push-buttons for all transmitter functions are also incorporated.

Serviceability is complete to tilt back of console to reach every part and connection. Desk is a deluxe steel office desk with typewriter well and triple drawer space. Frequency response within ½ db 30-15,000 cycles and noise is 70 db below +10 dbm output or better. — Though not mandatory for transmitter performance, the M-5120 Supervisory Control Console will add appreciated utility and convenience. Size and weight are listed on the preceding page.

* for Gates MO-2639 modulation monitor.
** for Gates SA-39B limiting amplifier.

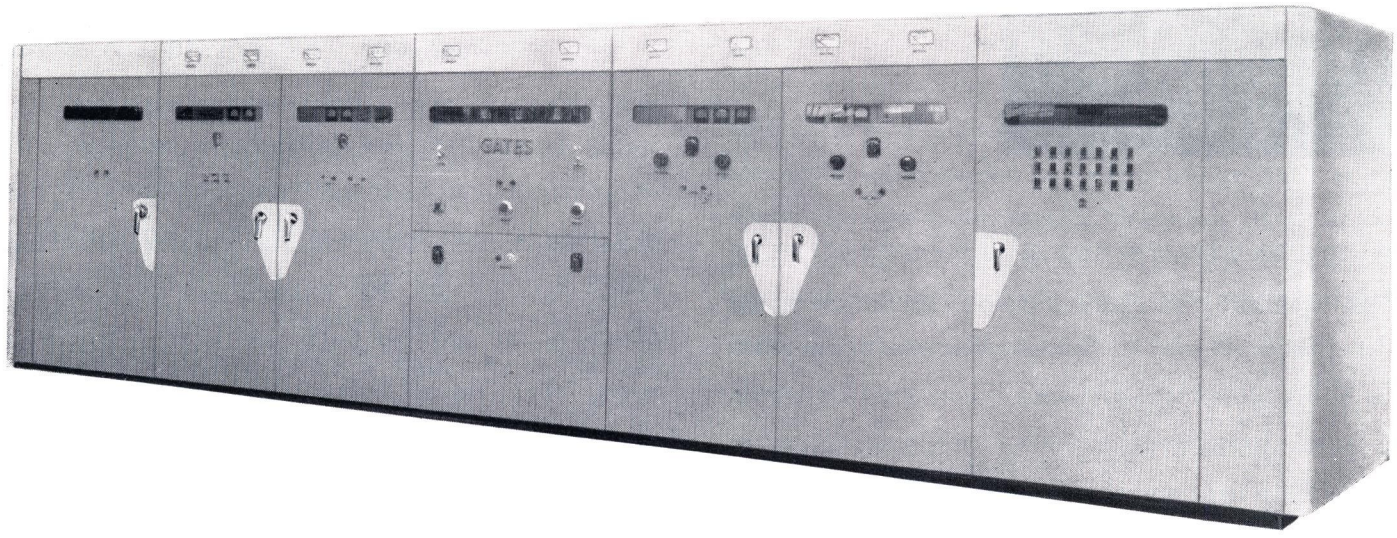
Complete Supervisory Console with Desk ..... Cat. M-5120



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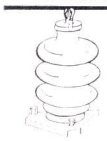
BC-100B 100,000 WATT BROADCAST TRANSMITTER



As the BC-50B, 50KW model, described on the several preceding pages, has so many 100KW features, it is only natural that this companion 100,000 watt model offers many outstanding and exclusive features. — High level modulation, 100% air cooling, a total of only eight tube types with the commanding feature of "massive power" defining big husky design, highlights this newest transmitting plant.

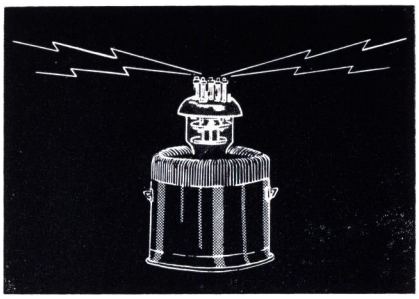
On the following pages, the reader is asked to refer to the BC-50B transmitter on the preceding pages. Major variance is in the high power stages, larger power supply and modulator components and slightly larger physical size. General appearance and construction has been standardized in the two models to effect manufacturing economy and less cost to our customers. — Complete specifications, simplified wiring diagram and floor plans for the 100,000 watt model are on the succeeding pages.

MASSIVE POWER



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MODEL BC-100B TRANSMITTER

(100,000 watts AM)

Realizing this transmitter may be used in all parts of the world and under often severe climatic conditions, generous safety factors are inbuilt. Critical component values have also been avoided to assure easy maintenance anywhere. BC-100B is 100% forced air cooled. Costly water cooling systems have been entirely eliminated. There are only 8 tube types and a total of 39 tubes, of which 22 are 2-element rectifiers. — An interesting feature is the 5891 tubes employed as power amplifiers and modulators cannot be harmed by simultaneous removal of both plate and filament voltage. This important feature is emphasized as many large power tubes in this category require continued forced air, after removal of voltages, to protect the end seals.

The BC-100B transmitter is completely automatic with proper sequencing of starting operations and full electrical and personnel protection. An electronic motor-driven auto transformer voltage regulator provides proper voltage to all filament and low power stages under wide variations of line voltage.

BC-100B is a totally wired and finished transmitter. The purchaser is not asked to construct the transmitter on arrival and need only busy himself with inter-connections of the normal conduit type. Mechanical construction is solid and rugged. Enclosures are built around welded channel frameworks. Aluminum divider panels supply excellent electrical shielding.

Power transformer section, consisting of modulation transformer, reactor, two filter reactors and six plate transformers are all oil-filled and in well built, leakproof steel tanks. They may be indoor or outdoor mounted, as the customer prefers or requires.

Mechanically, BC-100B is constructed in seven cubicles having a total width of 29' 10", depth of 5' 4" and height of 78" exclusive of door swing. Two independent cubicles house the contactors for the individual high voltage supplies. These seven cubicles or sections are as follows:

Cubicles 1 and 2: High Voltage Supplies

Separate six tube, 3-phase, full wave, high voltage supplies are provided for the radio frequency power amplifiers and the modulators. Each power supply is in its own cubicle and utilizes 857B rectifier tubes. The RF power supply delivers 12.5 kilovolts and the modulator supply 15 kilovolts. The circuit is designed for quadrature operation providing a high safety factor. Two small blowers supply spot air cooling to the base of each 857B rectifier tube.

Cubicle 3: Modulator

All of the audio system is in this section. First three stages are vertically mounted in the shielded back section. Modulator tubes are accessible by opening the front doors. A third spare tube socket is provided to keep the spare in readiness for nearly instantaneous cut in.

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Cubicle 4: RF Exciter

In this cubicle are located the Crystal Oscillator Unit, Buffer, Amplifier, Intermediate Amplifier and PA Driver. The RF bias rectifier, using 866A tubes, is mounted in this unit along with the 3KV plate supply, the modulator bias supply and the low rectifier. A duplicate crystal is mounted with the switching controlled from the front of the panel. Tuning facilities for the RF stages are on the front of this panel.

Cubicle 5: RF Power Amplifier

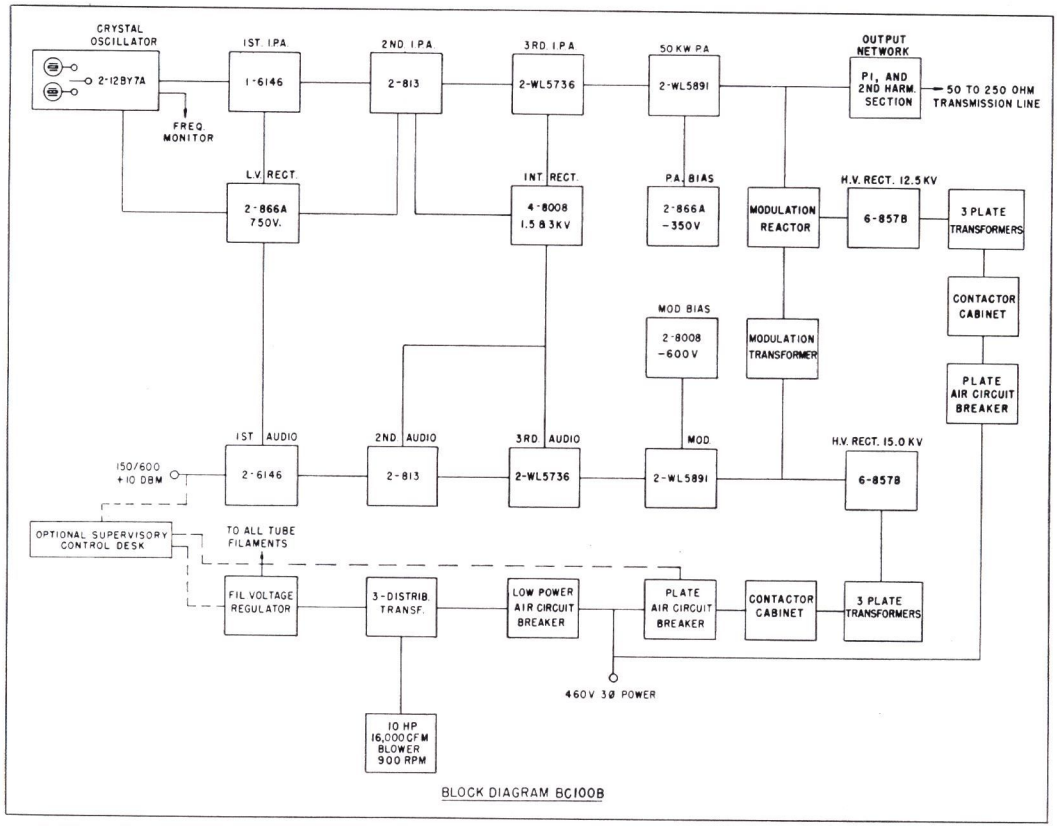
Here are the 5891 power tubes, each producing 50KW power to make up the 100KW output. A third spare socket is provided so the spare 5891 is quickly accessible. Control switches, filament selector and other metering switches are provided on the front doors.

Cubicle 6: Power Amplifier Tank/Output

Contained herein is the PA tank circuit consisting of a pi network using a Gates special built, silver plated coil tuned by motor-driven variable vacuum capacitors. The pi works into a T network, the two being shielded from each other to minimize harmonic transfer. In addition, a second harmonic section is made a part of the T to give added rejection to this specific frequency. This cubicle is pressurized by the main blower, as are the others making up the transmitter proper, to assure cool operation with a minimum of dust collections.

Cubicle 7: Protection

Every part of the transmitter is guarded with this elaborate and ingenious protective system. Circuit breakers, relays and status lights watch and indicate every circuit and automatically remove voltage for any abnormal reason. Recycling plus electronic filament/low voltage regulator are in this cubicle.

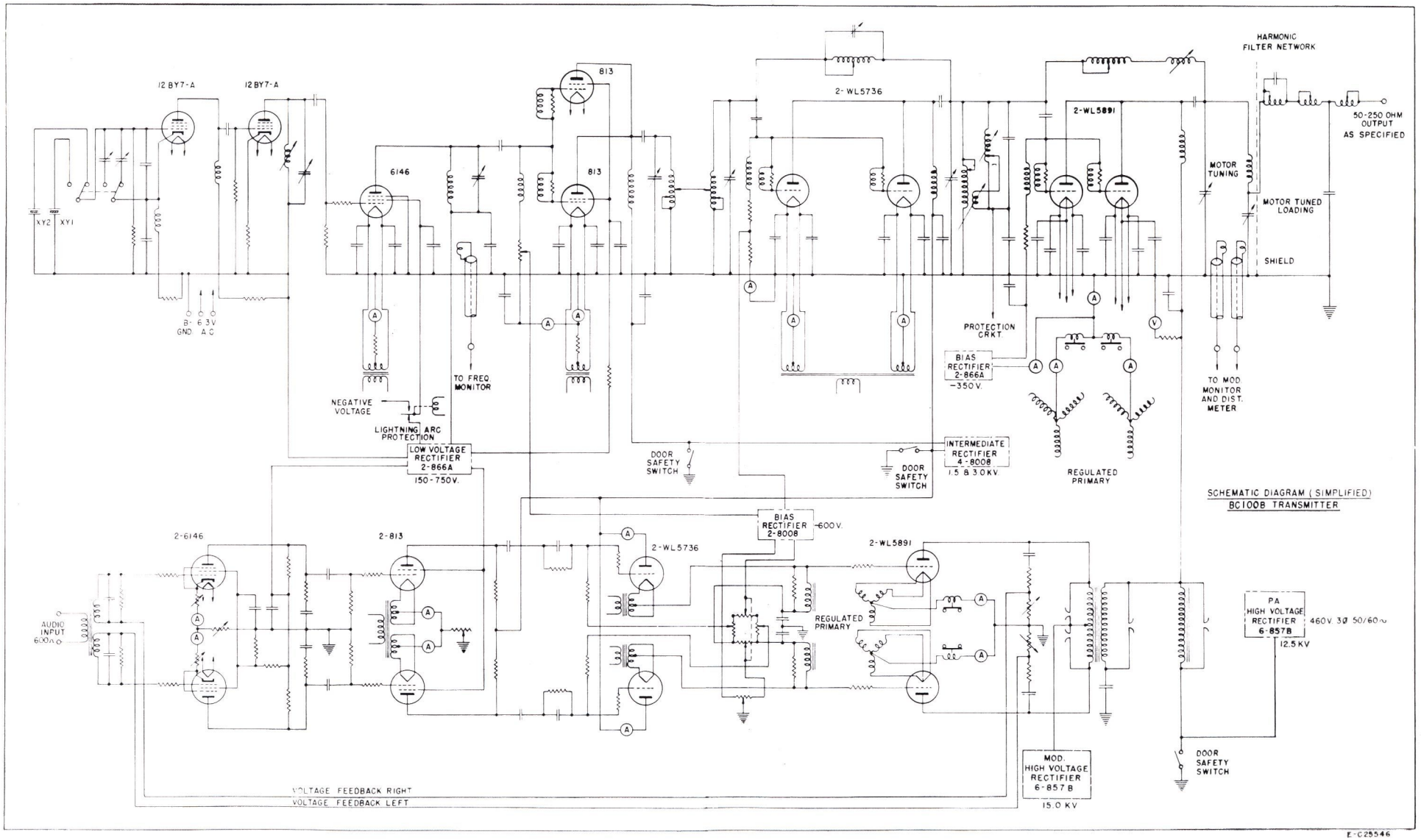


BLOCK DIAGRAM BC100B

C-C77763

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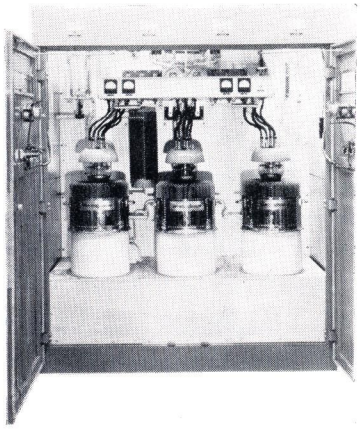
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SIMPLIFIED WIRING DIAGRAM OF "MASSIVE POWER" MODEL BC-100B 100,000 WATT TRANSMITTER. FOR EASY READING, THE DETAIL IS OMITTED.

ELECTRICAL DESCRIPTION

(BC-100B 100,000 Watts)



Basic circuits of the transmitter are shown in the simplified wiring diagram. The purpose of this drawing is to demonstrate the features of the Gates BC-100B transmitter; various power circuits and controls are shown only to the extent as to make clear the operation.

RF Channel

The Gates BC-100B transmitter uses a crystal controlled oscillator unit housed in a separate shielded compartment and a pair of 12BY7A tubes are in a stable, electron coupled oscillator and buffer circuit. Two individual vacuum crystals are provided, with either selective from the front panel. Frequency trimmers for individual adjustment of crystal frequency are on the front panel. Output of the oscillator unit is tuned and capacity coupled to the first IPA.

In the first intermediate power amplifier is found a 6146 tube operating at conservative plate and screen voltages. Where applicable to the station's particular antenna system, a special lightning arc protection circuit is incorporated in the screen circuit of this stage. This feature gives a momentary interruption of carrier output during lightning discharges rather than noticeable interruption by overload relays. At the same time audio input is attenuated so the modulator is not overloaded.

For the second IPA, two 813 tubes with 1500 volts plate supply are employed. Tuning is accomplished by a suitable combination of fixed and variable capacitances. The output is inductively coupled to the Power Amplifier Driver.

The PA driver consists of two type 5736 tubes operating in parallel. These tubes are excellent for this service and are the same tube type as used for modulator drivers. Characteristics of the 5736 tubes are so uniform that no unbalanced conditions will be encountered. This stage is coil neutralized with the same stable circuit as used in the Power Amplifier.

Two 5891 tubes are parallel operated in the radio frequency power amplifier. These are identical to those employed as modulators. The spare socket is conspicuous as a service plus for quick tube change if ever necessary. The tank, Tee and harmonic networks have been earlier discussed.

Audio Channel

Audio input is 600 ohms and the required input level is approximately +10 dbm for 100 kilowatts output modulated 100%. An input pad is incorporated in the transmitter, normally with 6 db attenuation, and is automatically placed in use when the transmitter is operated on low power with half voltage on the power amplifier.

The input stage consists of a pair of 6146 tubes in push-pull. This stage is resistance coupled to a pair of 813 tubes operating as voltage amplifiers. The third stage, that of the cathode coupled driver, uses a pair of 5736 tubes operating with a supply voltage of 3000 volts. The cathode impedance provides direct coupling to the modulator grids. A bias supply furnishes the required bias to the modulators, and as the cathode follower filaments are operated at this bias voltage, additional voltage from the bias supply provides the required bias for the driver tubes.

Again the twin 5891 tubes supplies an abundance of audio to power, to easily modulate the 100KW carrier at low distortion and wide response. A superbly designed modulation transformer/reactor combination along with 12 db of feedback, produces that rich and smooth quality that is characteristic of finely made transmitting equipment.

Control Circuits

The design of the control system is in keeping with the highest present day standards. Protection of valuable equipment, reliability and safety of personnel were constantly kept in mind in the design. All cubicle doors are interlocked, and in addition are provided with automatic, mechanical grounding switches for safety.

Desirable features such as three notch lockout, fail safe control system and simple power reduction are all included. A generous number of status lights mounted on the control unit door provides instant indication of failures and serve as a guide to their location.

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A reliable air pressure switch protects the large tubes in the unlikely event of blower failure or air duct blockage. No harm will be done if due to power failure, air is simultaneously removed along with plate and filament voltages. On normal shutdown a blower timer keeps normal air volume flowing for five minutes after filaments are turned off.

Switches to operate contactors are located near the Power Amplifier, Modulator and Rectifier tubes for quickly turning off a filament to permit easy tube switching.

Either automatic recycling or one shot overload may be selected from the front panel of the control unit. The automatic recycling circuit is returned to the control circuit in such a way that opening a door disables the recycling.

Cooling System

In air cooling, the blower becomes a very important equipment item. The finest blower money can buy is provided, delivering 16,000 cu. ft. of air at 2½ inches static pressure. The 950 RPM slow speed insures low air rush noise. Blower is operated by a 10 HP motor V belt driven with adjustable sheave to compensate for varied altitudes.

Supervisory Control Console

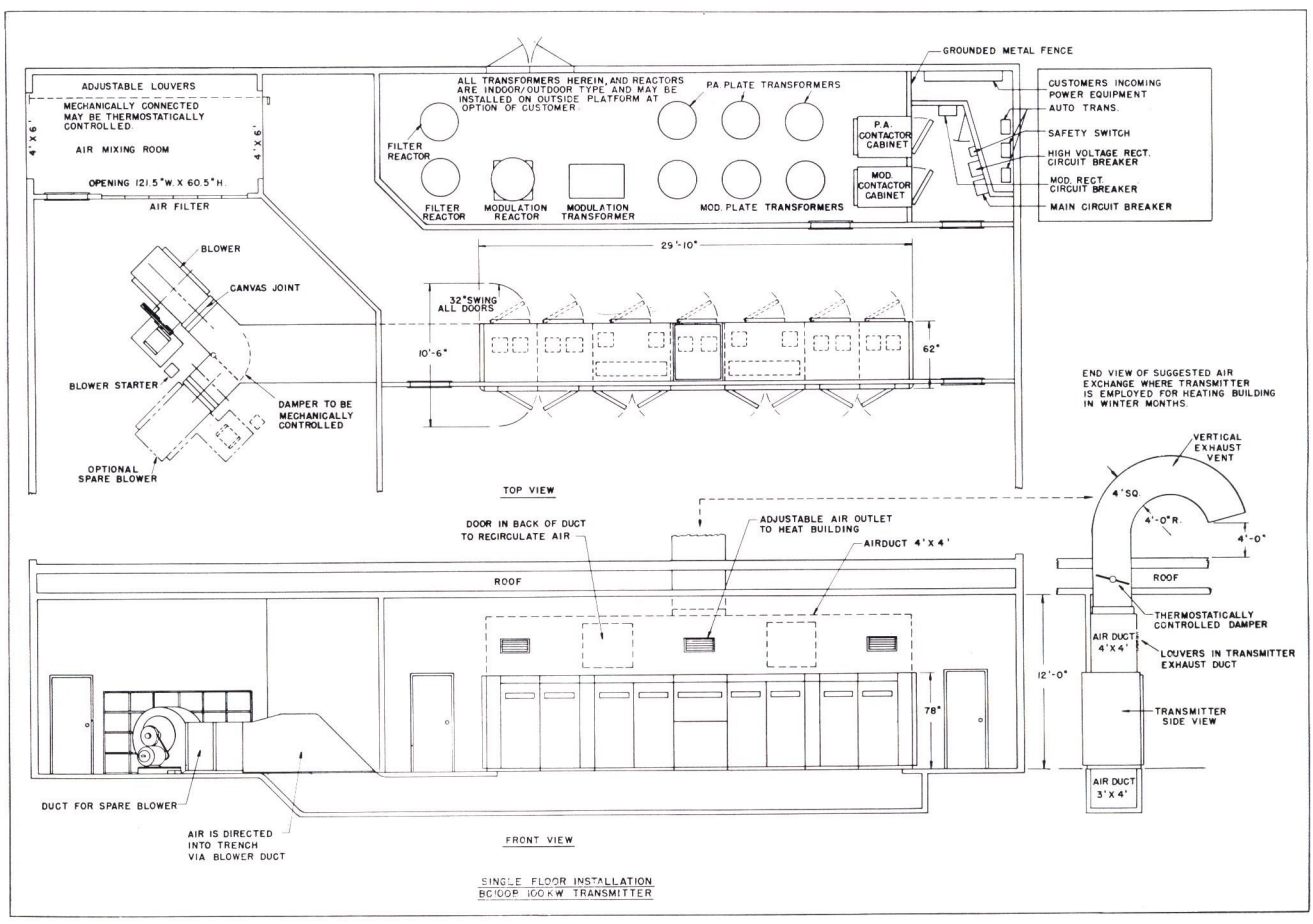
The M-5120 console and desk is fully described on Page 16 and is an ideal optional accessory for the BC-100B transmitter.

Floor Plans

Several suggested floor plans are shown on these pages, giving the installer the choice of a one-floor or a floor/basement arrangement. These plans are typical and may be altered to suit individual needs. Another layout is the outdoor platform for the "massive power" oil-filled components. In most cases, the use of outdoor mounting will be found desirable as a space saver and in taking advantage of the "massive power" showmanship by visability of these impressive components.

Gates Cooperation

In many instances, the purchaser of the BC-100B transmitter will concurrently construct a building. Gates will gladly cooperate in suggested building design or in approving building modifications in line with proper air flow, building heating, ventilation and electrical wiring. — This service is automatic where requested and, of course, without added charge.



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GATES

ELECTRICAL SPECIFICATIONS

(BC-100B 100,000 Watts)

TYPE OF EMISSION: A-3.

POWER OUTPUT: 103 KW.

FREQUENCY: 540 to 1600 Kc.

FREQUENCY STABILITY: ±10 cycles.

TYPE OF MODULATION: High Level, Class B.

RF OUTPUT IMPEDANCE: Unbalanced, 50-250 ohms.

AUDIO INPUT IMPEDANCE: 600 ohms, balanced.

AUDIO FREQUENCY INPUT LEVEL (100% Modulation):
+12 dbm, ±2 db.

AUDIO FREQUENCY RESPONSE:
±2 db, 30-10,000 cycles at 90% Modulation.
±1.5 db, 50-7500 cycles at 90% Modulation.

AUDIO FREQUENCY DISTORTION:
4% RMS or less, 50-7500 cycles at 90% Modulation.

NOISE LEVEL (RMS): 60 db below 100% Modulation.

TUBE COOLING SYSTEM: Forced Air Cooling.

CARRIER SHIFT: 5% or less at 100% Modulation.

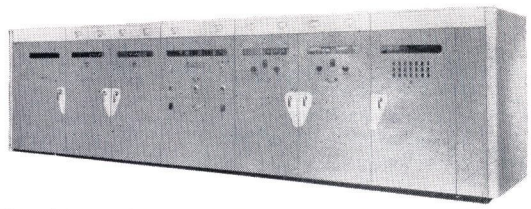
POWER FACTOR: 90%.

POWER LINE REQUIREMENTS: 460 Volts, 3 phase, 60 cycle.
50 cycle or other frequencies or voltages on special order.

POWER LINE REGULATION: ±2%.

POWER LINE REGULATION, No Load to Full Load: ±5%.

POWER CONSUMPTION:
Carrier (No Modulation): 158 KW at 90% PF.
Average Program (30% Modulation): 176 KW at 90% PF.
100% Modulation: 262 KW at 90% PF.



MECHANICAL SPECIFICATIONS

DIMENSION OF TRANSMITTER: 29' 10" wide, 5' 4" deep, 6' 6" high.

LARGEST CABINET SIZE FOR BUILDING ENTRANCE REQUIREMENTS:
66" wide, 64" deep, 78" high.

SPACE REQUIRED FOR MODULATION TRANSFORMER, REACTORS AND POWER TRANSFORMERS: 192 square feet.

BLOWER: 65¼" wide, 55½" deep, 64 1/8" high.

NET WEIGHT, Approximate: 36,000 pounds.

GROSS WEIGHT: (Approximate) 38,000 pounds.

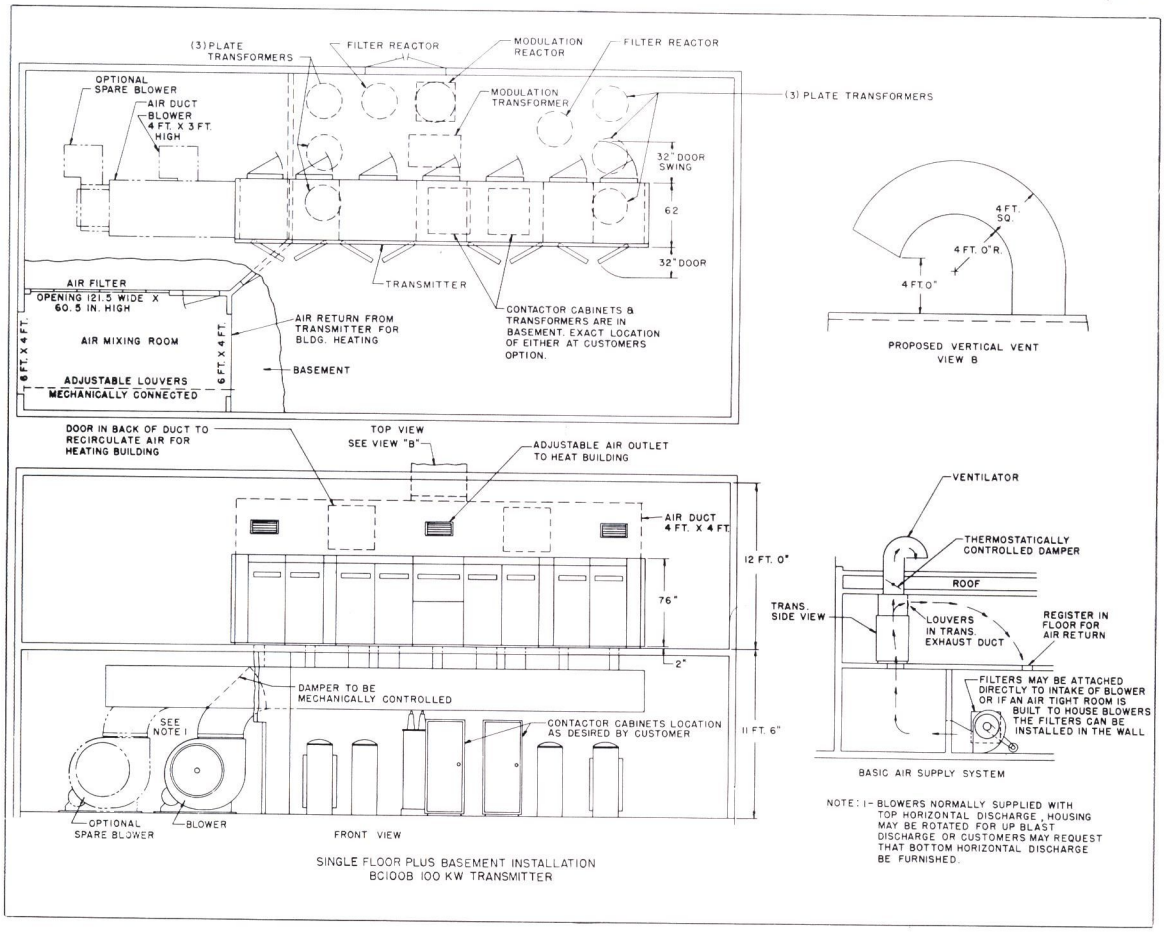
CUBAGE: (Approximate) 2,300 Cubic Feet.

TUBE COMPLEMENT

RF Channel

Oscillator Unit	2	12BY7A
Buffer Amplifier	1	6146
Intermediate Amplifier	2	813
RF Driver	2	5736
3 KV Rectifier	4	8008
Bias Rectifier	2	866A
Low Voltage Rectifier	2	866A
Power Amplifier	2	WL5891
Power Amplifier HV Rectifier	6	857B

(continued next page)



SINGLE FLOOR PLUS BASEMENT INSTALLATION
BC100B 100 KW TRANSMITTER

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TUBE COMPLEMENT (continued)

Audio Channel

Input Amplifier	2 — 6146
Intermediate Amplifier	2 — 813
Driver	2 — 5736
Modulator	2 — WL5891
Bias Rectifier	2 — 8008
Modulator HV Rectifier	6 — 857B

●

ORDERING INFORMATION

(Equipment Supplied)

1 — Complete transmitter section.*
2 — Contactor/primary distribution cabinets.
1 — Blower and filter equipment.
1 — Modulation transformer (oil-filled).
1 — Modulation reactor (oil-filled).
6 — Plate transformers (oil-filled).
2 — Filter reactors (oil-filled).
1 — Complete 100% set of tubes.
2 — Crystals to your frequency.
3 — Auto transformers for operating intermediate supplies at 230 volts.
2 — Instruction manuals.

* State frequency and output impedance when ordering.

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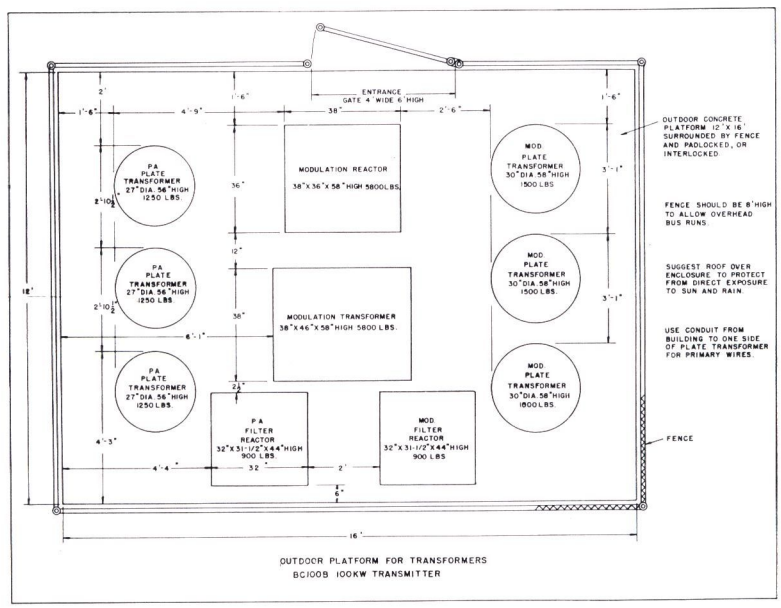
OPTIONAL ACCESSORIES

Supervisory control console and desk	Cat. M-5120
100% spare tube set	Cat. TK-297
FCC required spare tube set	Cat. TK-298
Spare blower with motor, complete	Cat. M-5590
Spare blower motor only	Cat. M-5591
Modification kit for 60 cycles	Cat. M-5592
Single tower antenna coupler *	Custom
Directional phasing equipment	Custom
Proof of performance equipment	Cat. SA-131
Spare parts kit to customer needs	Negotiation

* State frequency, tower height and all available antenna data, when ordering.

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Model BC-100B 100,000 watt transmitter ..... **Cat. M-5556**

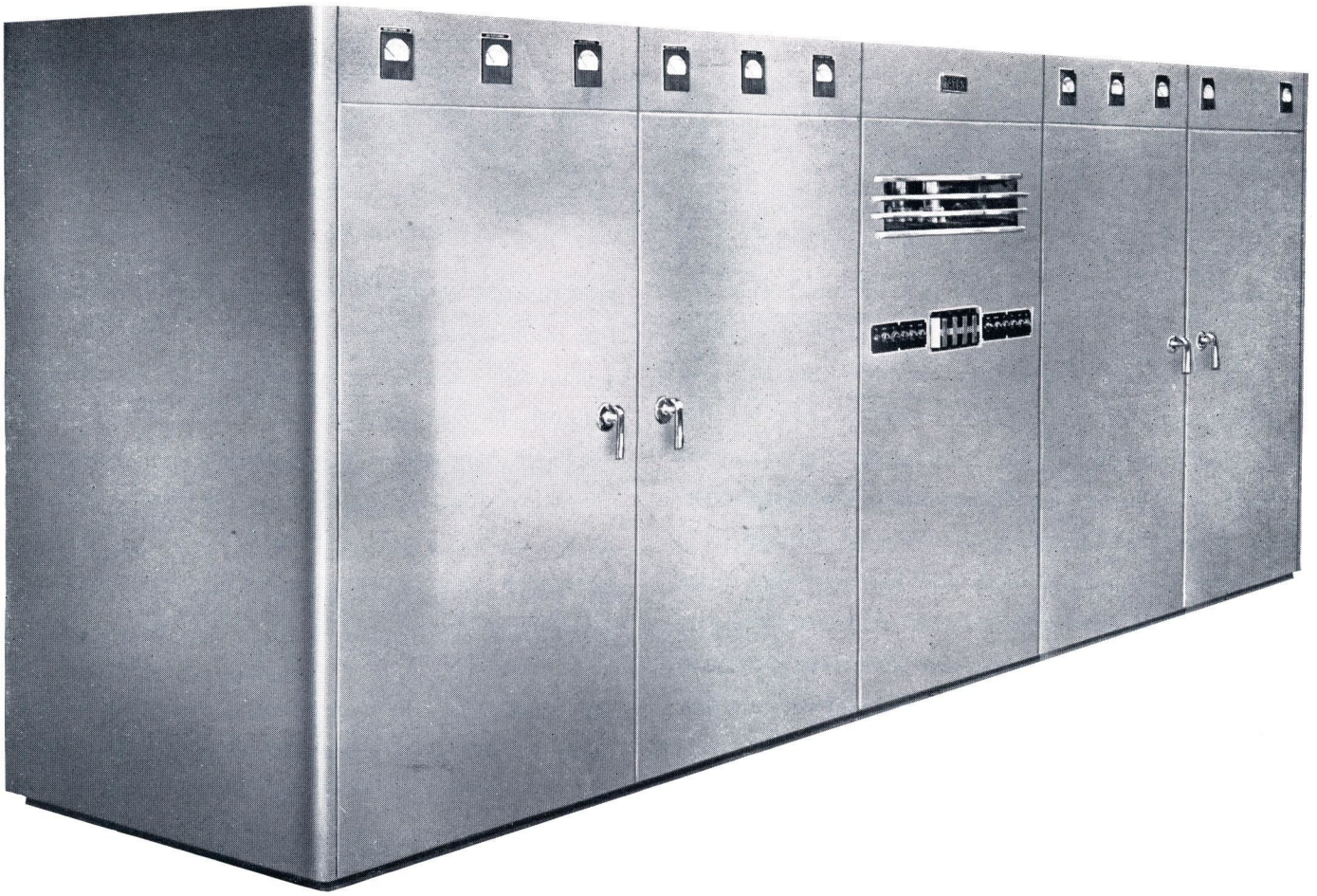


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GATES

MODEL BC-20B BROADCAST TRANSMITTER

(20,000 Watts)



This 20 KW AM broadcast transmitter is in world-wide service and provides wide range broadcast performance in the standard broadcast band of 540-1600 Kc. The Gates BC-20B transmitter has been particularly popular overseas and fills the definite area where 10 KW is not quite big enough and 50 KW is too much.

Heavy commercial construction is combined with **walk in to service** and modern up to date circuitry. Dual full wave, 3 phase, high voltage power supplies. One for the RF power amplifiers and the second for the modulators exemplifies the conservative approach to BC-20B design. — Tube complement utilizes thoriated single phase filament design in all power stages and tube cost is lower by a generous margin than any other transmitter in this power area.

The several following pages supply a detailed description of this time proven Gates quality transmitting plant.

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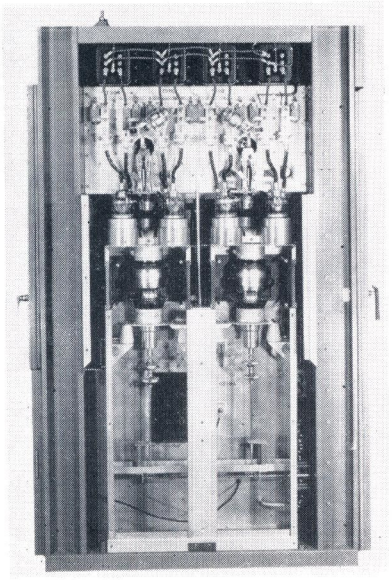
BC-20B 20,000 WATT BROADCAST TRANSMITTER

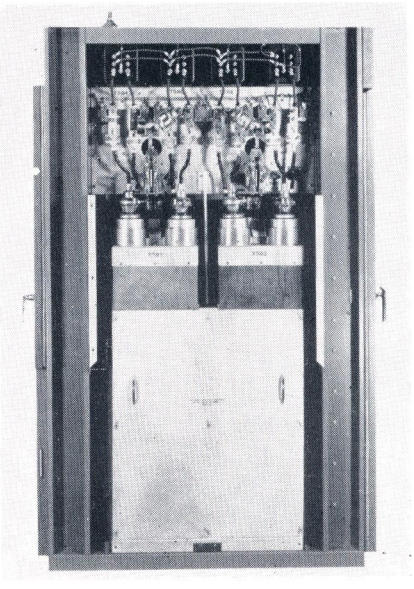
CONSTRUCTION: Five cubicles join together to house the 20KW radio frequency, audio frequency, protective and power supply units. The only external components are the two main power transformers, modulation transformer and reactor. These units are oil-filled and may be installed either in the building or on a protected platform outside the building. The transmitter is dead front, and all front doors may be opened without disrupting the carrier. No inter-cubicle cabling is required when installing. Each of the five cubicles is completely assembled and wired. These cubicles bolt together speedily. At the base of each cubicle are barrier terminal boards; and wiring of all cubicles together for an operating transmitter is accomplished by means of short jumpers between these terminal boards. Floor space, exclusive of external units mentioned above, is 210" wide, 78" high and 49" deep. Door swing of 40" should be allowed for both front and back doors. Finish is in hand rubbed medium gray with trimmings in chrome, brushed aluminum and anodized black.

RADIO FREQUENCY SECTION: Including oscillator, there are five radio frequency stages. All but the final amplifiers are self-neutralized. Dual crystals with closely held temperature controlled ovens excite a 6V6 oscillator with very low voltage applied for stability. IPA stages are 807, 6146 and dual 4-250A drivers. Four 3X2500F3 triodes comprise the pushpull power amplifier. Output coupling provides an impedance match from 40-270ohms as ordered.

MODULATOR SECTION: Gates engineers have built a truly fine audio system into BC-20B. Four audio stages are all pushpull. A special design transformer coupling system between the audio drivers and four 3X3000F1 modulators results in remarkably low distortion and wide response. Overall feedback is an adjunct to the excellent capabilities of the audio system without feedback. — Modulation transformer and reactor are heavy duty, oil-filled units for either indoor or outdoor service.

METERING: No multi-metering is employed, and a full meter complement is supplied to measure all necessary circuits both for tune-up and general operation. Individual plate current meters are provided for each of the power amplifier and modulator tubes.





Open and closed views of the husky power amplifier tube complement. The engineer will note the large variable vacuum tank capacitors are located in the main air chamber, cooling the four 3X2500F3 tubes. Though unnecessary, this feature adds to potential reliability.

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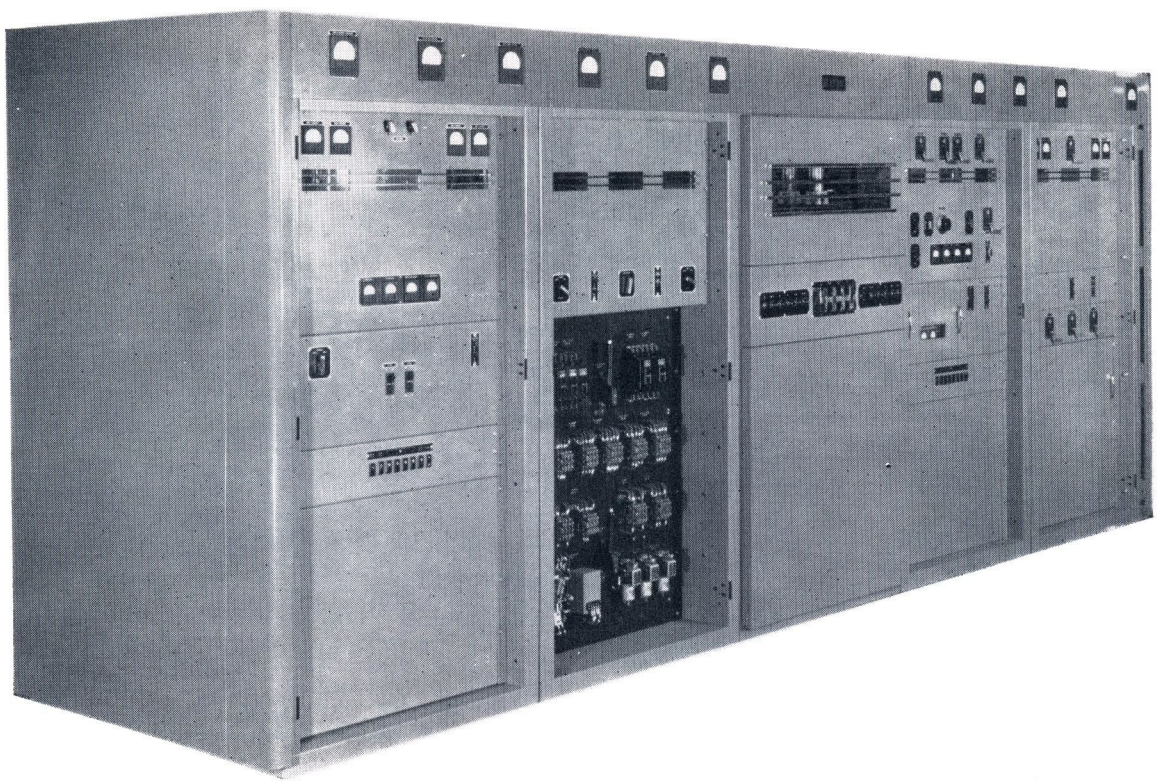
MODEL BC-20B

RELAYS AND PROTECTION: Gates engineers have provided protection to the point that no power consuming circuit of importance has been overlooked. Primary thermal breakers are inserted in all main primary lines. Individual supervisory overload relays are incorporated for, not only the transmitter main overload, but also for separate protection; exciter failure, air failure, RF driver, power amplifier, audio driver and modulators. Included are secondary relays for door interlock and air cooling interlock. Automatic condenser discharge relay switch immediately discharges the main filter capacitors when the door interlocks are disengaged.

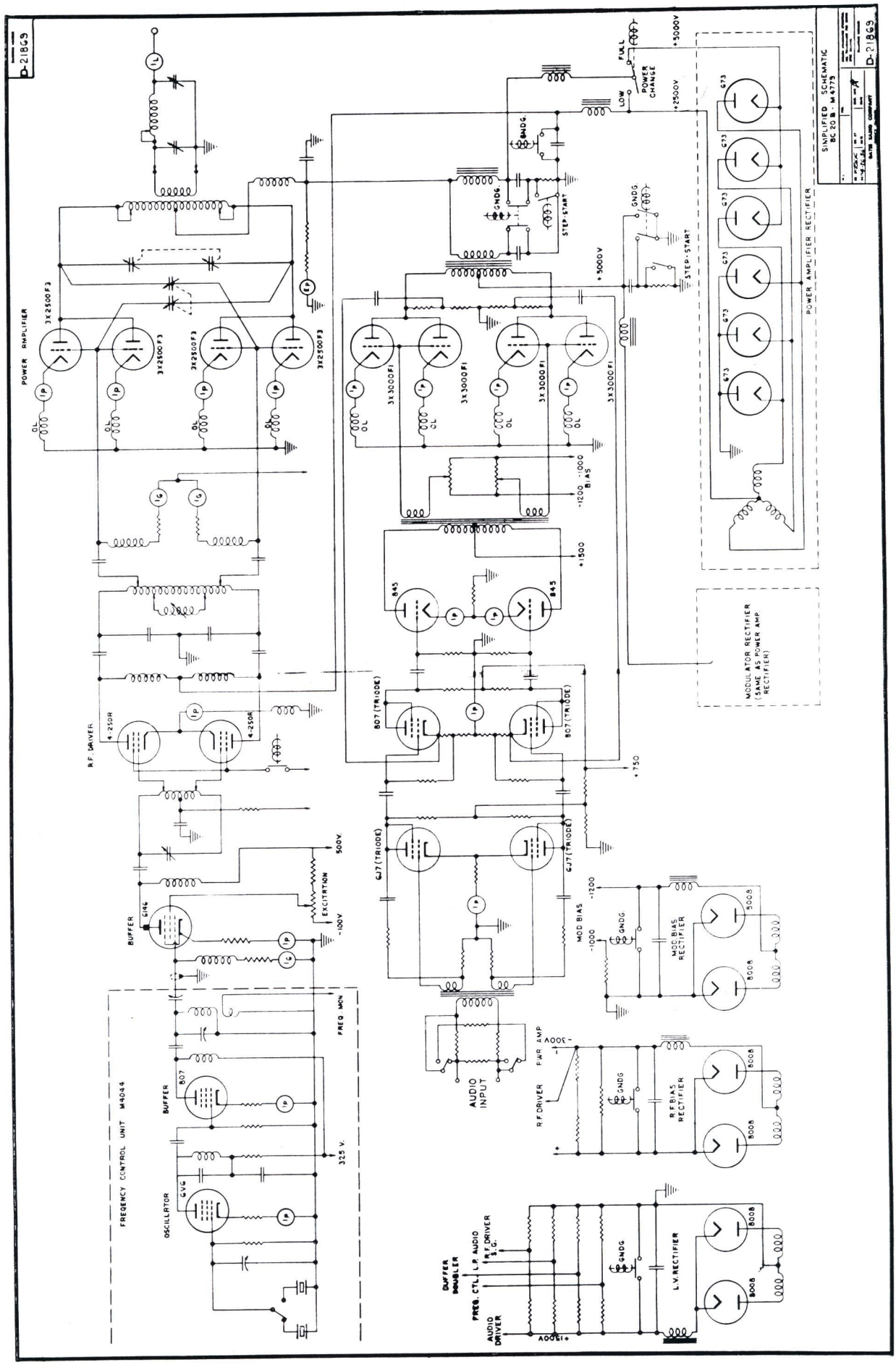
RECYCLING: Automatic recycling relay controls automatically where the carrier is disrupted, and attempts to reset the carrier four times before remaining off. Many times carrier interruption is caused by static discharges across the transmission line or tower base and this recycling feature is indispensable.

POWER SUPPLIES: Five major power supplies deliver plate and bias voltage to the BC-20 transmitter. Featured are the two complete high voltage supplies. One is used for the radio frequency power amplifier and the other for the modulators. The resulting almost perfect regulation is quickly recognized by the engineer. Likewise, in case of failure of one power supply, the remaining one can be bused in, operating the transmitter on reduced power until repairs are made. Each of these power supplies is full wave, three phase, six tube supplies. Other individual supplies provide modulator bias voltage, power amplifier bias voltage and intermediate voltage for driver stages. All power supplies are generously protected by circuit breakers, overload relays, etc.

PERFORMANCE: Recognizing this transmitter will be used in every climate of the world, every engineering attention was given to reliability under unusual conditions. Extra blower capacity in case of extreme heat is an example. BC-20B will produce a carrier with punch and on this carrier will be a rich transmission quality, the result of low distortion, wide response, low noise and excellent stability.



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BC-20B SPECIFICATIONS

ELECTRICAL

FREQUENCY RANGE: 540-1600 Kc as ordered.

RF OUTPUT IMPEDANCE: 40-270 ohms as ordered.

RATED POWER OUTPUT: 20,000 watts.

CAPABLE POWER OUTPUT: 21,250 watts.

POWER REDUCTION: Low power tune-up switch standard equipment.

POWER INPUT: 230 volt, 3 phase, 50 or 60 cycles (specify power line frequency when ordering). Other input voltages available on special order.

INPUT WATTS: No modulation, 37 KW.
Average modulation, 43 KW.
100% modulation (sine wave), 55 KW.

AUDIO RESPONSE: ±1½ db, 50-10,000 cycles.

RATED DISTORTION: 4% or less, 50-7500 cycles.

CAPABLE DISTORTION: 3% or less, 50-7500 cycles.

NOISE: 55 db or better below 100% modulation.

RF STABILITY: 0.005% or better.

MONITORS: Provision for RF take-off for both frequency and modulation monitors.

CRYSTAL: Supplied in temperature controlled oven.

TUBES: (Radio Frequency) 6V6 osc., 807 IPA, 6146 IPA, (2) 4-250A IPA, (4) 3X2500F3 power amplifiers.

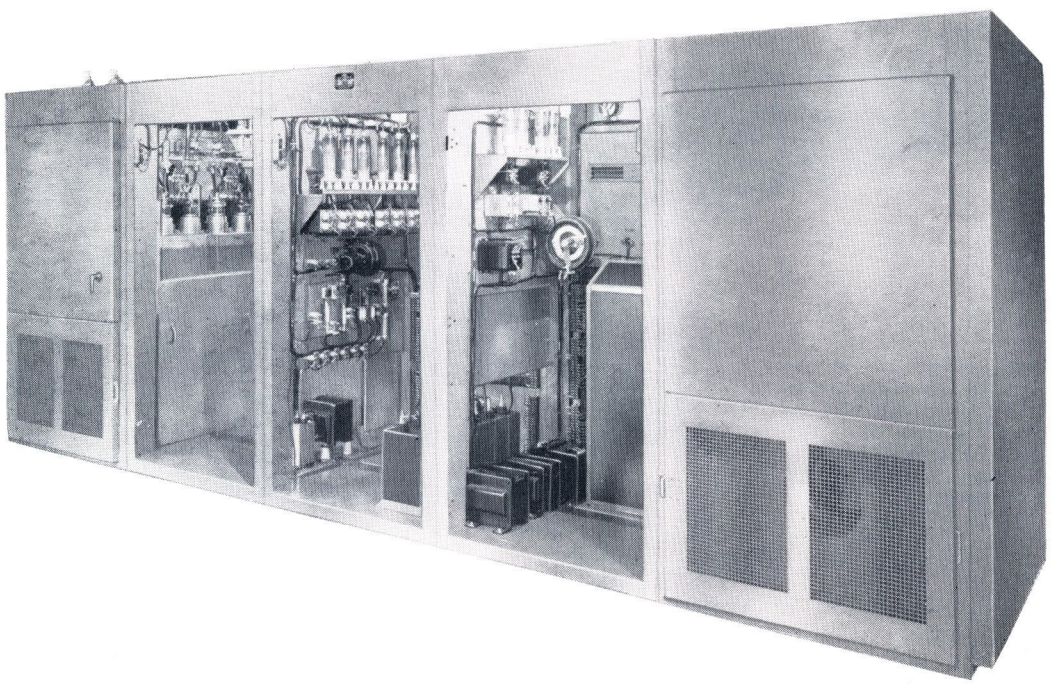
(Audio Section) (2) 6J7 1st audio, (2) 807 2nd audio, (2) 845 3rd audio, (4) 3X3000F1 modulators.

(Power Supplies) (12) 673, (6) 8008.

Total tubes: 37

Number of tube types: 10

METERING: Line current RF
Plate volts RF
Filament volts
Primary volts
Modulator plates (4 meters)
Power amplifier plates (4 meters)
Oscillator plate
807 1st IPA plate
6146 2nd IPA plate
6146 2nd IPA grid
4-250A 3rd IPA plate
3-2500X3 grids (2 meters)
6J7 plates (audio)
807 plates (2nd audio)
845 plates (2 meters) 3rd audio



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BC-20B SPECIFICATIONS

MECHANICAL

SIZE: (less external transformers illustrated) — 210" wide, 49" deep, 78" high. Door swing, front and rear, 40". Floor space external transformers, 10'x2½'.

WEIGHT: Packed, 23,000 lbs. Net, 19,500 lbs.

CUBAGE: 720.

FLOOR PLAN: Please refer to index "Model HF-20B" high frequency model for floor plan, which is identical.

EQUIPMENT SUPPLIED AS STANDARD

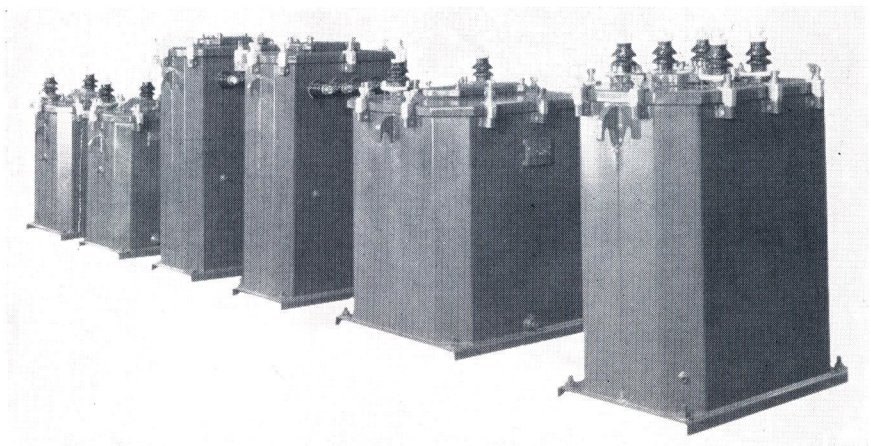
1 — Complete transmitter section (5 cubicles) ready to install, completely wired and assembled. Blowers are self-contained.
1 — Oil-filled modulation transmormer*.
1 — Oil-filled modulator reactor*.
2 — Oil-filled power transformers*.
2 — Oil-filled filter reactors*.
1 — Complete 100% set of tubes.
1 — Crystal and oven.
2 — Instruction Books.

NOTE: BC-20B is a complete transmitter as listed above, ready to operate at the carrier frequency and RF output impedance you specify.

*** For indoor or outdoor service.**

ORDERING INFORMATION

Transmitter complete as listed above	**BC-20B**
Extra crystal and oven	**JK-57M**
Spare 100% tube complement	**TK-139**
Single tower antenna coupler	**see index**
Directional phasing equipment	**see index**
Supervisory console (see Page 16)	**M-5120**



These six heavy external units are part of BC-20B and may be indoor or outdoor mounted. From left to right: filter reactor RF high voltage, filter reactor modulator HV, power transformer RF, power transformer modulator, modulation reactor, modulation transformer.

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5000 WATT AM BROADCAST TRANSMITTER

Model BC-5P



New, modern and accepted world-wide, the Gates BC-5P is endorsed by an illustrious list of satisfied users. Each of the 3 cubicles is independent from the other and each is individually cooled. The result is the coolest operating "Five" ever built. — Here is a transmitter that will meet the future rigid demands of low spurious radiation. — Quality is evident everywhere and Gates specialization in broadcast equipment manufacturing permits tooling and manufacturing processes that price-wise, are advantageous to Gates customers.

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GATES

BC-5P 5000 WATTS AM

Providing the industry with the very latest in modern transmitter design is a Gates enjoyable habit. — Here is a new and different broadcast transmitter . . . smaller in floor area, yet big as ever in cubical content. A 100% air cooled RF power plant strides many steps forward by cooling all of the important radio frequency components instead of only the power tubes.

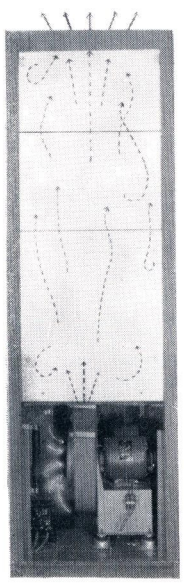
Performance standards reach a new high! Lower spurious radiation looks to the obvious tighter demands as the electronic age expands. Every day reliability is the result of conservative component specifications and a 3-cabinet cooling system replacing the single blower.

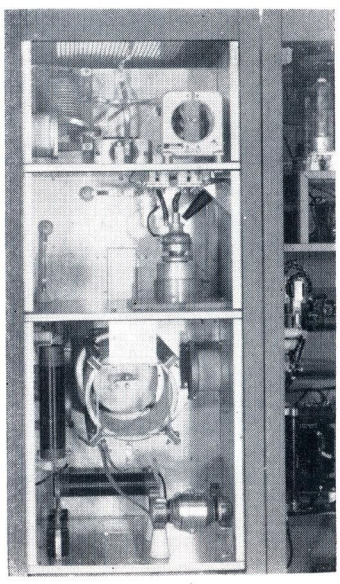
Lower tube cost is twofold in both the lowest dollar cost for a 100% tube complement and longer tube life through the advanced cooling system and high efficiency.

Fidelity, or what the listener often refers to as rich tonal quality, is far more than wide and uniform frequency response. In the Gates BC-5P transmitter, careful attention has been given to intermodulation, assured day to day low noise without resorting to selected tubes or tedious circuit balancing and other vital elements such as stability, low carrier shift and attention to audio transformer design in line with extremely low leakage reactance and phase shift to move low distortion into a normal expectancy without unusual transmitter adjustments or maintenance.

Mechanically, BC-5P is modern in styling and yet conservative in appearance. Front access doors slip in place. Rear doors are full length of the latch-on type. There are no external components of any kind—BC-5P is 100% self-contained.

BC-5P is an engineer's transmitter. Nothing has been left wanting while much has been incorporated to become a pleasant surprise. Only Gates could build so fine a product at so modest a price because with Gates, broadcasting equipment is a major endeavor and **not a side line.**

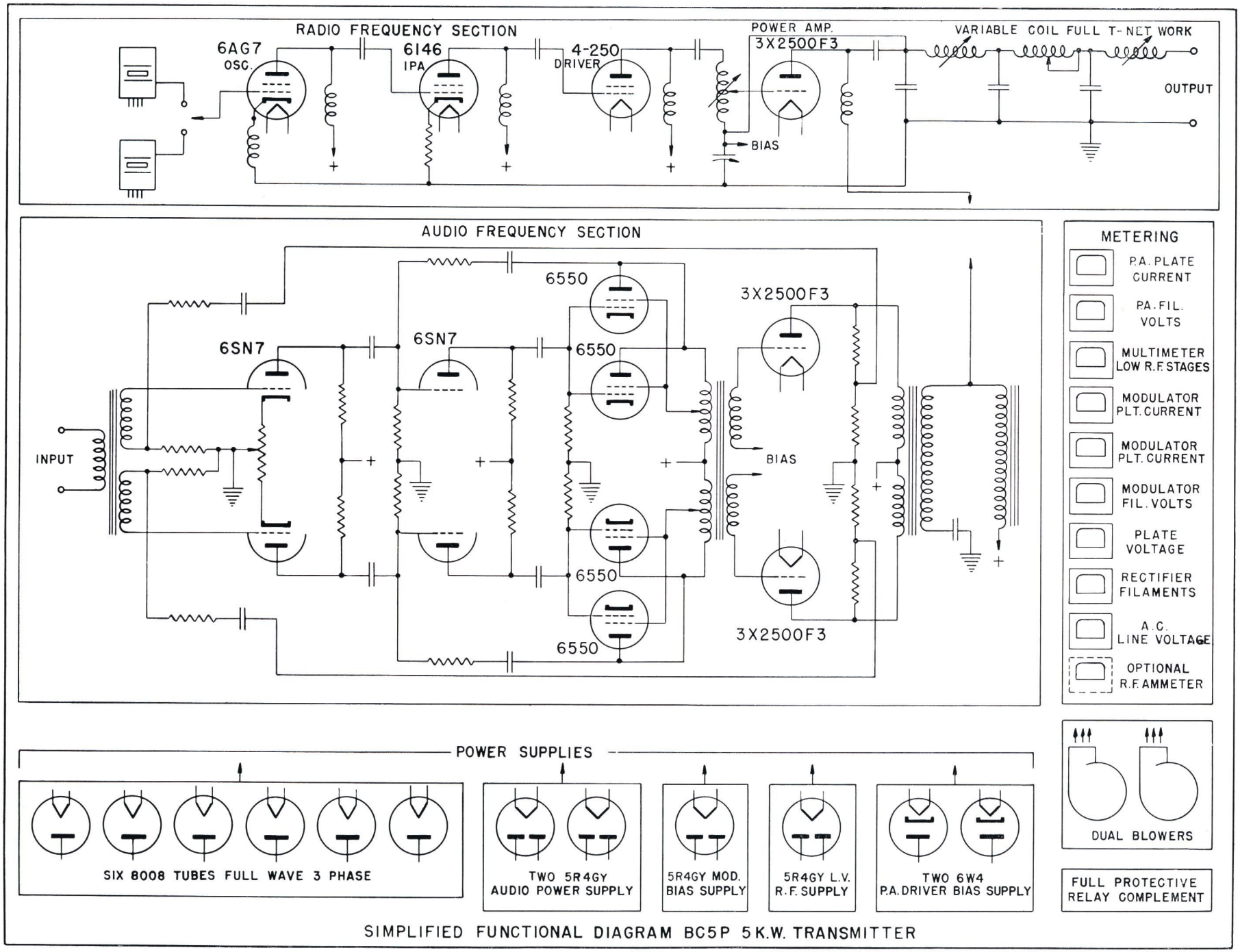




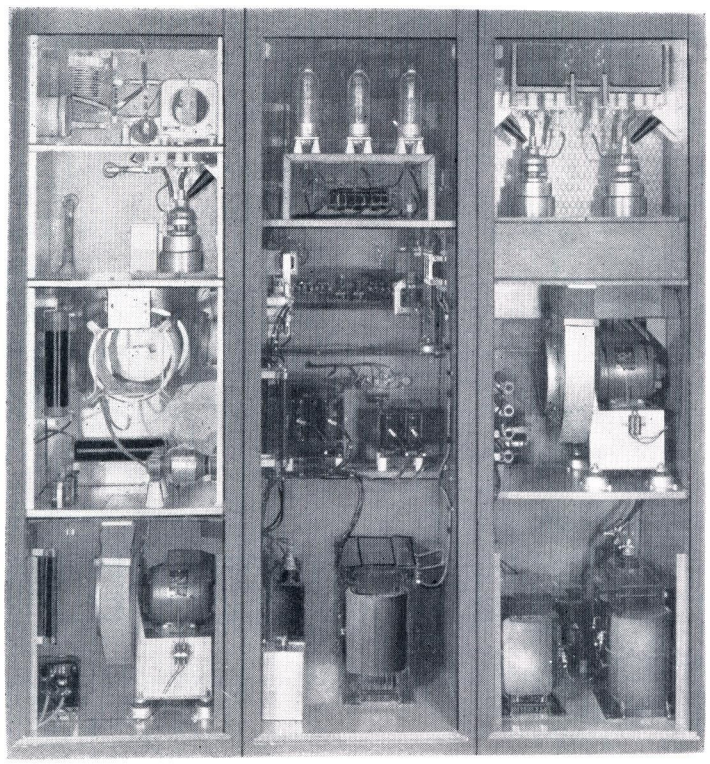
Open (right) and closed (left) views of the BC-5P radio frequency section. Dotted lines in left illustration indicate flow of filtered air around all components in the right open illustration. This total shielding for spurious radiation becomes a cool air chamber for many parts that will now be trouble-free.

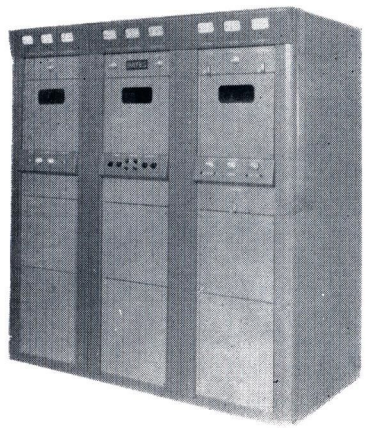
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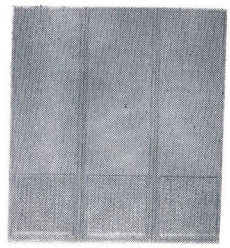
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SIMPLIFIED FUNCTIONAL DIAGRAM BC5P 5K.W. TRANSMITTER







MODEL BC-5P 5KW

(continued)

RADIO FREQUENCY SECTION: In the above rear view, the RF section is the left cubicle. As each cubicle is mechanically independent of the other, the RF cubicle could also be to the right or completely separate. In this way, the RF section may be placed exactly convenient to the desired phasor location or transmission line exit from the building. — Headed by dual vacuum type crystals requiring neither oven, thermometer nor thermostat, the four RF stages are self-neutralized except the triode 3X2500F3 power amplifier. — The final tank plus the complete 2-coil Tee output coupling network is variable coil tuned, eliminating chance for arc over. The squirrel cage blower at the bottom cools this cubicle only and places every major component under forced air.

AUDIO SECTION: This cubicle can be moved from left to right too. A second independent cubicle is forced air cooled by another blower identical to that in the RF cubicle. Four stages, all push-pull, feature an ultra linear driver amplifier, known world-wide as the ultimate in low distortion audio. Modulators are Class B 3X2500F3 tubes and are interchangeable with the RF power amplifier. Overall feedback from the modulator plates to the input stage grids, adds to the excellent performance possible even without feedback.

POWER SUPPLIES: Five power supplies include (a) the six tube, full wave, 5000 volt, high voltage supply, (b) audio driver supply, (c) RF driver supply, (d) modulator bias supply, and (e) RF bias supply. All are well regulated and excellently filtered power supplies of the highest order.

PROTECTIVE: A complete relay complement for overload, start-stop, interlock and condenser discharge. Air pressure switches replace the older damper type interlock to supply 100% protection in case of failure.

REMOTE CONTROL: The use of relays in the protective system is a natural adjunct for easy attachment of remote

(continued next page)

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MODEL BC-5P 5000 WATTS

(continued)

REMOTE CONTROL (continued)

control. As circuit breakers are not used in major control circuits, alterations, either mechanical or electrical, are negligible.

RECYCLING: In case of overload the transmitter automatically places itself back on the air until overload has been determined permanent, an indispensable feature for both attended and unattended operation.

COOLING: RF cubicle and modulator cubicles have individual shock mounted impeller type blowers developing 270 CFM at 1.4" pressure. Power supply cubicle has exhaust fan in top. All motors are single phase for easy maintenance.

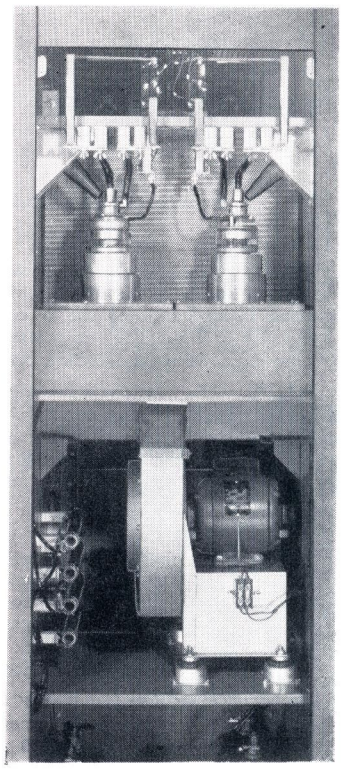
STYLING AND CONSTRUCTION: Attractively finished in two-tone. Base color medium dark gloss gray, hand rubbed with second tone in medium light gray. Control knobs in anodized aluminum and knurled for firm gripping. — Other colors available on special order. — Top meter panels tilt forward and down for ease in vision. Center control panels tilt forward and up for ease in handling. — Parts provided for viewing tubes. Front panels of semi-hinged type are instantly removable for servicing. Three back doors of latch-on type conserve space. Three cleanable air intake filters are removable without turning off transmitter.

SIZE AND WEIGHT: Several floor plan layouts are provided on subsequent pages. Features conservative floor space. 78" high, 39½" front to back, 73½" wide. With no swinging doors either front or back, only minimum aisle clearance required. Net weight 2186 lbs., packed weight 2970 lbs. Cubage, 198.

Below: BC-5P 5000 watt transmitter with single cubicle phasor added. As each transmitter cubicle is mechanically independent of the other, phasor and RF cubicle may be to left or right. Floor space is 8' 1½" x 3' 3½" deep.



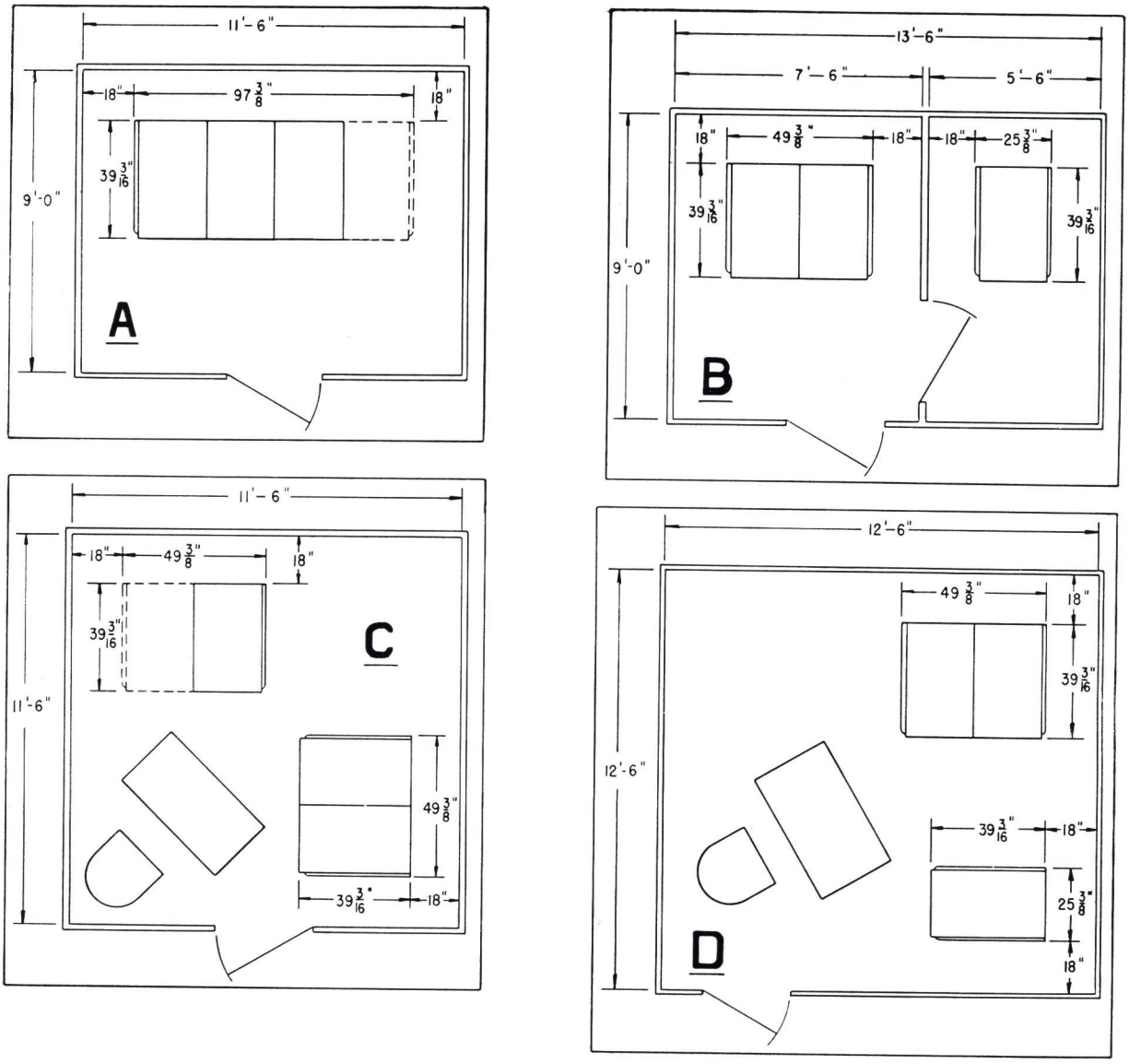
Below: Partial rear view of modulator cubicle, illustrating dual 3X2500F3 modulators and 270 CFM impeller type blower. Note entire blower assembly is shock mounted.



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BC-5P AND BC-10P VERSATILE FLOOR PLANS



Shown above are four typical floor arrangements for Models BC-5P and BC-10P, which are identical in width and depth.

FIG A: Three cubicles comprise the transmitter. The fourth (dotted line) may be either a phasor or extra RF cubicle for Conelrad or standby. The RF cubicle and phasor may be to the left or right side, as preferred. Note very small floor area even with extra cubicle added.

FIG. B: Often when increasing power to 5KW the transmitter building is too small. As each cubicle in BC-5P or BC-10P is independent, they may be moved around as desired. Here, one of the BC-5P cubicles has been placed in the tool or bunk room. This may also be a simple lean-to added to the present building.

FIG. C: In this arrangement a square building accommodates 2 cubicles on one side of the room and 2 cubicles at 90° angle. In this way, a complete transmitter plus phasor will install in the most cramped quarters, leaving ample room for a rack or audio, monitor and remote control equipment. As both front and back doors are of latch-on type, provision for door swing is unnecessary.

FIG. D: Another method of BC-5P and BC-10P installation. Floor space, in this arrangement, is kept to an absolute minimum. Actually most 250 watt buildings will accommodate this arrangement.

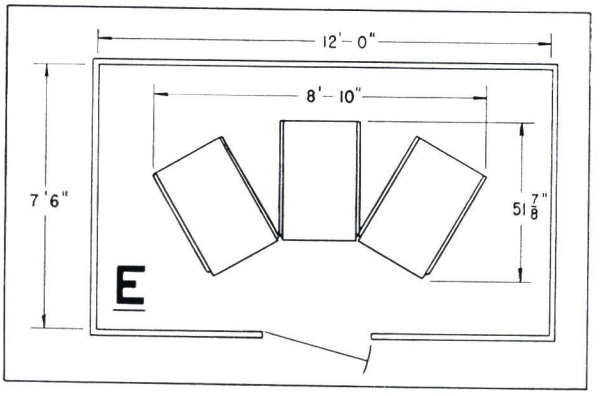


FIG E: Here is something different in 5 and 10KW floor arrangements. Only Gates design permits a semi-horseshoe floor plan. Only Gates has independent cubical design where cooling and electrical construction is complete in each cabinet or cubicle and wire jumpers between cubicles is the only necessity for complete operation.

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BC-5P SPECIFICATIONS

RATED POWER OUTPUT: 5000 watts.

CAPABLE POWER OUTPUT: 5600 watts.

POWER INPUT: 230 volts, 3 phase, 50/60 cycles.

POWER DEMAND: Carrier, 11KW. Average modulation, 12½KW. 100% modulation, 17KW.

POWER REDUCTION: Carrier reduction to 1KW.

POWER FACTOR: 90%.

CARRIER SHIFT: 3% or less at 100% modulation.

IMPEDANCES: Audio input, 600/150 ohms at −5 dbm. RF output, 40-270 ohms, as ordered.

FREQUENCY RANGE: 535-2000 kc, as ordered.

FREQUENCY STABILITY: ±5 cycles.

AUDIO RESPONSE: Average programming ±1½ db, 30-12,000 cycles. Where ordered, transmitter will be supplied to maximum high frequency response of 7500 cycles to meet proposed new FCC regulations for lower sideband radiation.

AUDIO DISTORTION: 3% or less, 50-7500 cycles at 95% modulation.

INTER-MODULATION DISTORTION: At 90% modulation typical inter-modulation of 3% at 60 and 7000 cycles is measured.

NOISE: 60 db or better below 100% modulation at 5KW power.

YOUR BONUS: As BC-5P transmitter is made for both 50 and 60 cycles, all transformers are made larger to cope with 50 cycle needs. This is a bonus safety factor for 60 cycle users and assures prompt delivery to our many 50 cycle customers.

FCC REQUIREMENTS: 99% of usable sideband power has been confined to a bandwidth corresponding to the proposed new FCC regulations. Complete shielding of power amplifier/loading components including power tube assures much lower spurious radiation with the eye to meeting new regulations. It is believed the Gates BC-5P transmitter will meet possible revised FCC regulations now under consideration.

CONELRAD: As each radio frequency cubicle is independent to the overall transmitter, a second RF cubicle for Conelrad may be purchased at less cost than a separate Conelrad transmitter. Simple instantaneous relay switching to Conelrad.

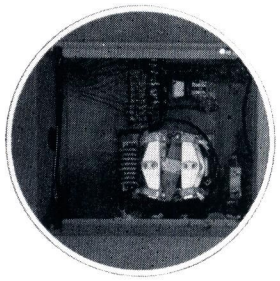
WEIGHTS AND CUBAGE:

Net weight: 2610 lbs.
Gross weight: domestic packed, 3040 lbs.
export packed, 3390 lbs.
Cubage: 321.



The 3X2500F3 tube is used in both RF and modulator service. — Tube complement for the BC-5P is lowest cost of any "Five" manufactured today.

Below: A single solenoid relay in the Conelrad RF cubicle is push button operated to change from the main RF section to Conelrad.



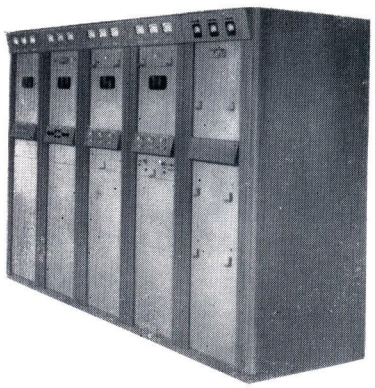
ORDERING INFORMATION

Model BC-5P transmitter complete with one set of tubes, crystal and to carrier frequency and RF output impedance as ordered	**M-5565**
Extra RF cubicle for Conelrad or standby. Includes inbuilt automatic changeover solenoid relay, less tubes and crystal**	**M-5190A**
100% spare tube kit	**TK-248**
FCC spare tube kit	**TK-259**
Spare crystal with vacuum holder	**M-5602**
Phasing equipment	**Custom**
Right-hand end bell and style trim*	**M-5600**
Left-hand end bell and style trim*	**M-5601**

* Only needed where cubicles are separated for installation.

** State frequency and output impedance when ordering. Order M-5602 crystal to frequency. Tubes for Conelrad are usually spare tubes where 100% spare tube kit TK-248 is on hand.

Five-cubicle transmitter may consist of basic transmitter plus Conelrad RF cubicle and phasor. Same arrangement could be transmitter plus two-cabinet phasing equipment.



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10,000 WATTS BROADCAST—NEW MODEL BC-10P



For the **satellite age** a new 10,000 watt broadcast transmitter! Modern design all the way with the emphasis on wide frequency response to satisfy the discriminating music lover, less floor space to permit a power jump in the same building facilities and low operating cost via reliability for lesser maintenance and lowest tube replacement cost.

BC-10P is another Gates product pleasing to the budget maker. The cost is modest by reason of the extensive planning for production. Known as **manufacturing engineering,** production talent and engineering skills join together for a better product to be constructed under advanced manufacturing methods in one of the industry's most modern electronics factories.

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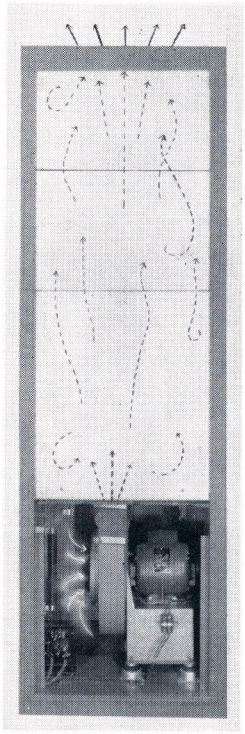
GATES

BC-10P 10,000 WATT BROADCAST TRANSMITTER

Good broadcast transmitters must meet basic Federal Communications Commission requirements. The BC-10P transmitter generously exceeds these requirements. The specifications on Page 40 and the block diagram on Page 41 will provide the excellent circuit design and performance expectations for this transmitter. Let's then look at the above expectancy portion of BC-10P.

HARMONIC RADIATION is realistically reduced by constructing the entire radio frequency section within a heavy aluminum enclosure. This is known as elimination of cabinet radiation, otherwise serious in higher powered transmitters. — The tank circuit includes a full Tee network, coil tuned and void of variable capacitors. It is believed no 10 KW transmitter will equal the low potential harmonic radiation of the BC-10P transmitting plant.

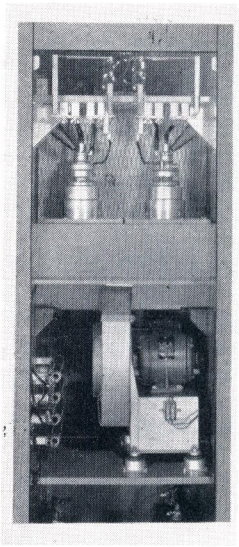
FIDELITY of the BC-10P transmitter extends to 15,000 cycles. Where adjacent channel conditions will not permit 15,000 cycle response, this may be reduced to meet FCC requirements. Low distortion is even more important to high fidelity than wide frequency response. The use of cathode follower audio drive, overall audio feedback and over-powered RF grid drive assures day to day low distortion without exhaustive alignment and balancing. Not to be overlooked is the use of low impedance modulator tubes where transformer ratio between modulator plates and Class C amplifier impedance is near unity and conducive to best audio transfer at high efficiency and lower distortion.



Rear closed view of the air stream through the aluminum enclosed RF section. The blower brings in cool filtered air. On its way to cooling the power tubes, this air passes by capacitors, inductors and other components to add to reliability.

COOLING: Many factors are associated with reliability. Cooling is the most important. The BC-10P transmitter incorporates individual cooling for each of the three cubicles comprising the entire equipment. Instead of one master blower, as in older models, where hot air could be spilled into another part of the transmitter, BC-10P has three sealed separate air chambers, each cooled separately. In this way, all air from the filtered intake at the base of each cubicle is sent thru to the top exhaust point quite like the up draft of a fireplace. Components in the RF section are cooled with the tubes, remembering the RF section is in an aluminum chamber. — There is no cooler operating 10 kilowatter than the Gates BC-10P.

TUBES AND LIFE: Though the BC-10P has the lowest cost tube complement of any 10 KW broadcast transmitter, of much greater value is the long tube life and tube interchangeability. — Major recognition must be given to interchangeability of RF power amplifier and modulator tubes in both maintaining highest performance standards and ability to obtain the last ounce of tube life through interchangeability. But again, the masterful cooling system plays a major part in tube life. The torrent of BC-10P air develops the longer tube life from the lowest cost tube complement.



A partial rear view of the modulator cubicle. Here another blower nearly smothers the tubes in air. There is no way for warm air to spill into an adjoining cubicle.

REMOTE CONTROL: Whether attended or unattended, the engineer should note the 100% relay complement and absence of circuit breakers in control circuits. To adapt to remote control is as simple as making the connections. No major mechanical alterations or addition of control relays is necessary if remote control is in your operating picture. Remote control systems are listed on Pages 89-93.

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GATES

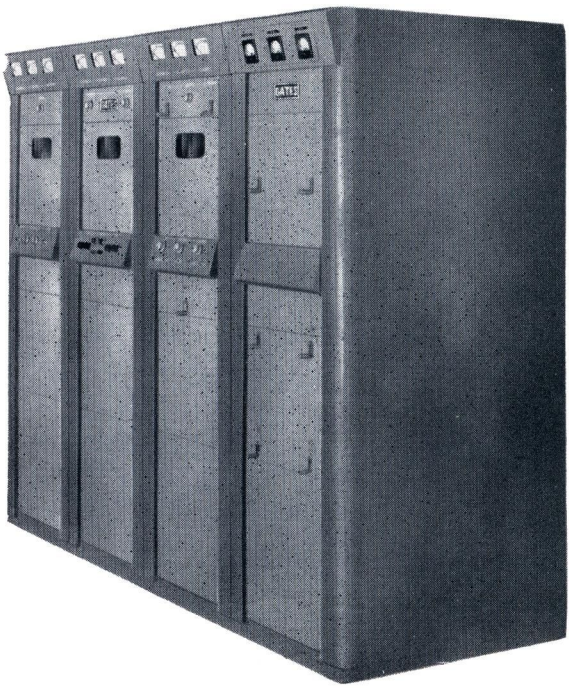
BC-10P 10,000 WATTS

SELF-CONTAINED: BC-10P is 100% self-contained and requires no external transformers or cabinets other than illustrated.

REPLACEMENT AREA: Those increasing power or replacing existing equipment will note the floor space area is 73½" wide and 39½" deep. Back doors are of the latch-on type and no door swing allowance is necessary. Even older model 1KW transmitters often nearly consumed this area. Installation of BC-10P may be made in nearly all buildings housing lower powered equipment at the present time.

OSCILLATOR: New vacuum mount ovenless crystals are used with pin-point accuracy. There is provision for two.

INSTALLATION VERSATILITY: In BC-10P design, each cubicle is independent and only connected together electrically. The cubicles may be installed as desired. If the RF cubicle installs better as the left instead of right cubicle, install it that way. Cubicles may even be installed at right angles or opposite to save floor space or add to convenience.



Gates BC-10P transmitter with 2-tower directional phasing equipment as right cabinet. Phasors with any number of elements can be supplied in matching cabinet or cabinets.

SPECIFICATIONS

STYLING AND CONSTRUCTION: Beautifully finished in two-tone. Base color: dark industrial gray, with second color in semi-gloss rose gray. Control knobs in anodized aluminum and kurled for firm gripping. — Other colors available on special order. — Top meter panels tilt forward and down for ease in vision. Center control panels tilt forward and up for ease in handling. — Parts provided for viewing tubes. Front panels of semi-hinged type are instantly removable for servicing. Three back doors of latch-on type conserve space. Three cleanable air intake filters are removable without turning off transmitter.

SIZE AND WEIGHT: Features conservative floor space. 78" high, 39½" front to back, 73½" wide. With no swinging doors either front or back, only minimum aisle clearance required. Net weight 2650 lbs., packed weight 3400 lbs. Cubage 198.

RF POWER PLANT: Single ended dual 3X2500F3 air cooled power stage feeds full-fledged Tee network. Tank and load tuning by variable coils. Optional RF ammeter in direct electrical circuit visible through port. Dual vacuum mount crystals excite untuned Colpitts oscillator. 6146 IPA and 4-250A tetrode drives 3X2500F3 power amplifiers. Maximum output power of 10,600 watts accommodates most complicated multi-tower phasor. Complete RF section is in right cubicle.

AUDIO: Four push-pull stages with overall feedback. Dual 3X2500F3 modulators interchangeable with RF power amplifier. Audio driver is cathode follower design. Modulator/audio section in left cubicle.

POWER SUPPLIES: Four in all, 3 low voltage supplies plus 3 phase full wave (six 673 tubes) main power supply.

RECYCLING: In case of overload, transmitter automatically recycles and places itself back on air. A rapid succession of overloads removes the high voltage. For remote control, this feature indispensable.

PROTECTIVE DEVICES: Full overload, start, stop and interlock protection of relay type. No electrical or mechanical alterations necessary for adapting to remote control.

CONSTRUCTION: Built in 3 separate independent cubicles that may be either joined together or, where space is at a premium, one of the cubicles may be at right angle or even in a separate room. Each cubicle independently cooled to prevent warm air from one cubicle spilling over to adjoining cubicle.

COOLING: Two squirrel cage shock mounted blowers cool RF and modulator cubicles including tubes. Exhaust fan installed in ceiling of rectifier cubicle. Single phase motors are used for easy servicing and maintenance.

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BC-10P 10,000 WATTS

TUBES: (2) 12BY7A osc./isolation buffer, 6146 IPA, 4-250A RF driver, (2) 3X2500F3 RF power amplifiers, (5) 5R4GYA LV power supply rectifiers, (6) 673 HV power supply rectifiers, (2) 6W4 hold bias rectifiers, 6SN7 first audio, (2) 6BG6 second audio, (4) 6528 cathode follower driver amplifiers, (2) 3X2500F3 modulators.

CONELRAD: As each radio frequency cubicle is independent to the overall transmitter, a second RF cubicle for Conelrad may be purchased at less cost than a separate Conelrad transmitter. Simple instantaneous relay switching to Conelrad.

RATED POWER OUTPUT: 10,000 watts.

CAPABLE POWER OUTPUT: 10,600 watts.

POWER INPUT: 230 volts, 3 phase, 50/60 cycles.

POWER DEMAND: Carrier, 18KW. Average modulation, 21KW. 100% modulation, 26KW.

POWER REDUCTION: Carrier reduction to low power (2500 watts) for tune-up. Other power reductions on special order.

POWER FACTOR: 90%.

CARRIER SHIFT: 3% or less at 100% modulation.

IMPEDANCES: Audio input, 600/150 ohms at 0 dbm. RF output, 40-270 ohms, as ordered.

FREQUENCY RANGE: 535 Kc to 2000 Kc as ordered.

FREQUENCY STABILITY: ±10 cycles (typical ±2 cycles).

AUDIO RESPONSE: ±1½ db, 30-10,000 cycles at 95% modulation. ±1½ db, 30-15,000 cycles under typical programming conditions.

AUDIO DISTORTION: 3% or less 50-7500 cycles at 95% modulation including all harmonics to 45,000 cycles.

NOISE: 60 db or better below 100% modulation.

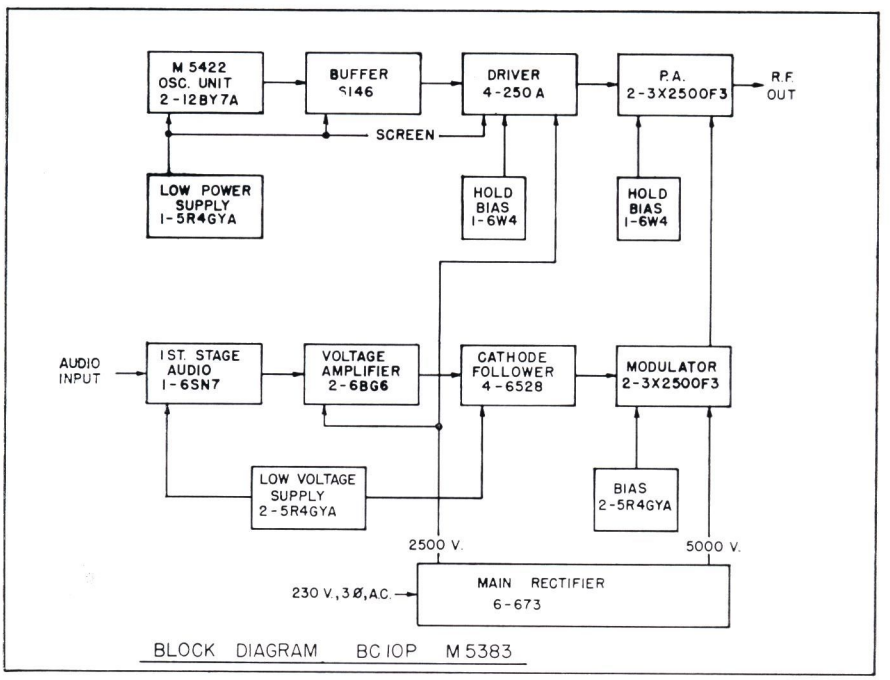
SIZE: 73½" wide, 39½" deep, 78" high. Largest cubicle (for door entrance) 27¾" x 39½" x 78" high.

YOUR BONUS: As BC-10P transmitter is made for both 50 and 60 cycles, all transformers are made larger to cope with 50 cycle needs. This is a bonus safety factor for 60 cycle users and assures prompt delivery to our many 50 cycle customers.

ORDERING INFORMATION

Transmitter complete with one set of tubes and one crystal	**BC-10P**
Spare crystal and vacuum mounting	**A30866**
100% spare tube kit	**TK314**
FCC required spare tube kit	**TK315**

NOTE: Kindly state carrier frequency and RF output impedance, when ordering.



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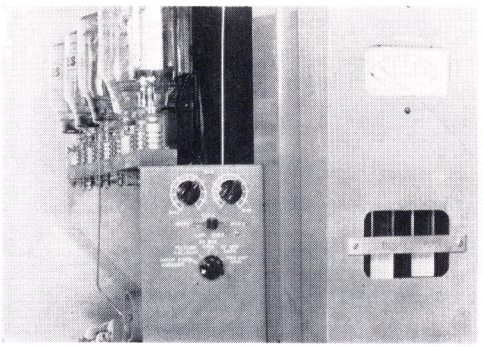
GATES

MODEL BC-1T 1000 WATT BROADCAST TRANSMITTER



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GATES



MODEL BC-1T — THE ENGINEER'S TRANSMITTER

Again Gates engineers have provided the one kilowatt broadcasting industry **the transmitter of tomorrow!** — Entirely new in electrical design, all new in functional design and styling, a new high in performance standards with the **big plus** of the extra features only found in Gates. These features largely came from your suggestions and the result is **the engineer's transmitter.**

THE INBUILT DUMMY ANTENNA was suggested by many broadcast men. "We want a way to do off-the-air testing that is positive, reliable, accurate and quick," they said. Now, for the first time, comes a transmitter, the Gates BC-1T, which offers this important exclusive.

THAT BOTHERSOME BACK DOOR consumes wasted floor space. "Let us have a transmitter 100% serviceable from the front," was a repeated suggestion. First again, comes a transmitter fully accessible from the front.

"FREQUENCY STABILITY must certainly be possible," broadcasters said, "without the crystal oven, thermostats and thermometers." BC-1T has dual vacuum type crystal units with pin-point stability and without ovens, thermostats and thermometers.

FIRST AGAIN is a broadcast transmitter with the uniformity and positive results of printed wiring. Here results are always the same. This tremendous plus tells the maintenance engineer his work is easier and management the initial cost is lower through technological progress.

HIGH FIDELITY is often correctly thought of as wide frequency response. In BC-1T is added **lower distortion** and lower noise. BC-1T distortion is more frequent in the one percent range range and noise in the lower sixties. The result is **all the way** high fidelity or what the listener calls — "Right nice!"

AND RELIABILITY comes only through the big design. A glance at the inner cabinet tells the story. Big, husky Gates-built edgewise tank and Tee network coils, scientific design for cooling, replaces the hodge-podge of indiscriminate assemblage of components and big transformers that invite 24-hour schedules.

ISN'T IT TRUE that a well built transmitter inside becomes a handsome product outside? Modern styling of BC-1T was a natural as the inside electrical styling is so symmetrical. Indeed, the Gates BC-1T radiates modernism in today's modern broadcasting station.

LITTLE THINGS are important too. The tilted vertical meter panel, illuminated bar type Off-On controls, magnetic front door catches and concealed tuning controls — to mention a few. But the **big performance** is BC-1T's claim to fame. Like the many one kilowatt predecessors of the Gates line, BC-1T is certainly the engineer's transmitter. "Dependable performer" — "Well done" will be its historical note.

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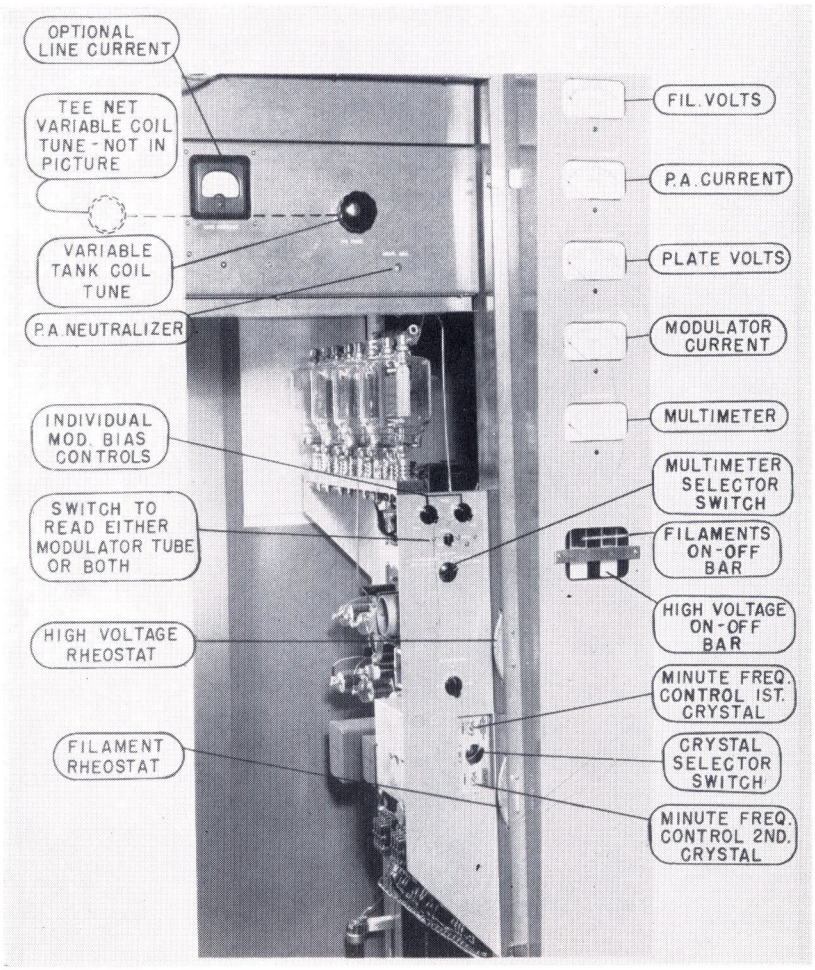
GATES

GENERAL DESCRIPTION MODEL BC-1T

(1000 Watt Broadcast Transmitter)

CONSTRUCTION is in a heavy 16 gg. steel cabinet, rigidly reinforced and attractively styled. Meter panel slopes forward for ease in observation and gives the added touch for today's modern radio age. A full length front door is held closed by magnetic door catches. Behind the front door is a full length perforated screen, interlocked for personnel protection but affording full view of components from top to bottom, with the transmitter in operation. This perforated screen may be removed in seconds by means of snap locks. — All operating controls are instantly accessible by opening the door. — At the bottom front is a full width filtered air intake grill. Exhausted air is brought out of the top by dual exhaust fans. Though the back of the transmitter is quickly removable, there is no need to do so as all servicing is accomplished from the front. With this design exclusive, the transmitter may be located near or against the wall with great savings in floor space and the convenience of more usable room in the transmitter building. The cabinet side is also removable. Though the need is unlikely, every part may be reached, down to the smallest resistor, in seconds. — BC-1T is the **engineer's transmitter.**

OPTIONAL LINE CURRENT: The word optional refers to the range of the meter.



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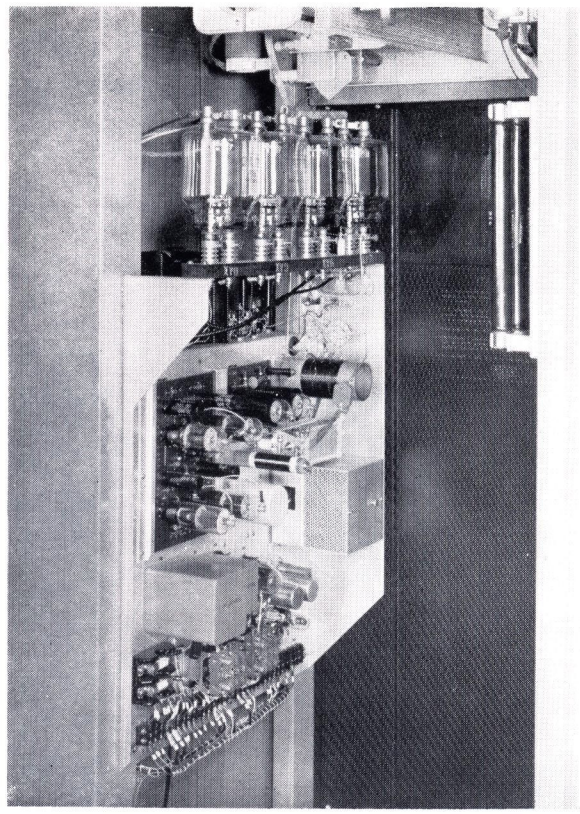
GENERAL DESCRIPTION MODEL BC-1T

FOR OFF AIR TESTING, Gates offers for the first time, the inbuilt dummy antenna that will handle the full 1000 watts power 100% modulated. For the new station yet to go on the air, complete tests may be made even before the tower is up, often saving hours of time. — The station already on the air will find this feature indispensable. Regular maintenance becomes a pleasure. Testing may be done any time instead of awaiting the wee hours of after midnight. A light indicates when the dummy antenna is in use to omit possibility of leaving dummy antenna in the circuit for regular broadcasting.

LISTENABILITY is defined as that unusual rich quality that holds listeners to BC-1T dial spots. The combination of cathode follower, a modulation system that modulates both the Class C and driver amplifiers and overall feedback, results in a new distortion low. — Prototype BC-1T transmitter actually produced 50 cycle distortion as low as one-half of one percent. As a result, production models may be easily held in the one percent range. This is **listenability.** The frequency response has been gently tilted up at 50 and 10,000 cycles to balance often found response losses in other parts of the overall broadcasting system. The total **at the receiver** result is a sales producing transmission.

PRINTED WIRING is uniformity. Wiring is always errorless. More important is reliability. No wires to chafe or deteriorate in the more critical circuits of the transmitter. Do not confuse printed wiring with printed circuit. In BC-1T there are no printed components — only printed wiring. The oscillator — IPA unit, RF driver section, audio amplifier section and feedback ladder are all printed wiring. — In maintenance and point to point checking, the engineer will not overlook the tremendous advantage of printed wiring with no wires or parts stacked on top of each other and the realization "this wiring is errorless" today and in years to come.

LOCAL REMOTE CONTROL is handled entirely by relays. No hard to adapt circuit breakers are employed. Terminals are incorporated for attachment of filament on-off and high voltage on-off for remote control. Overload relays and time delay relays are all of the type and circuit which assures positive protection and easy adaption to remote control.

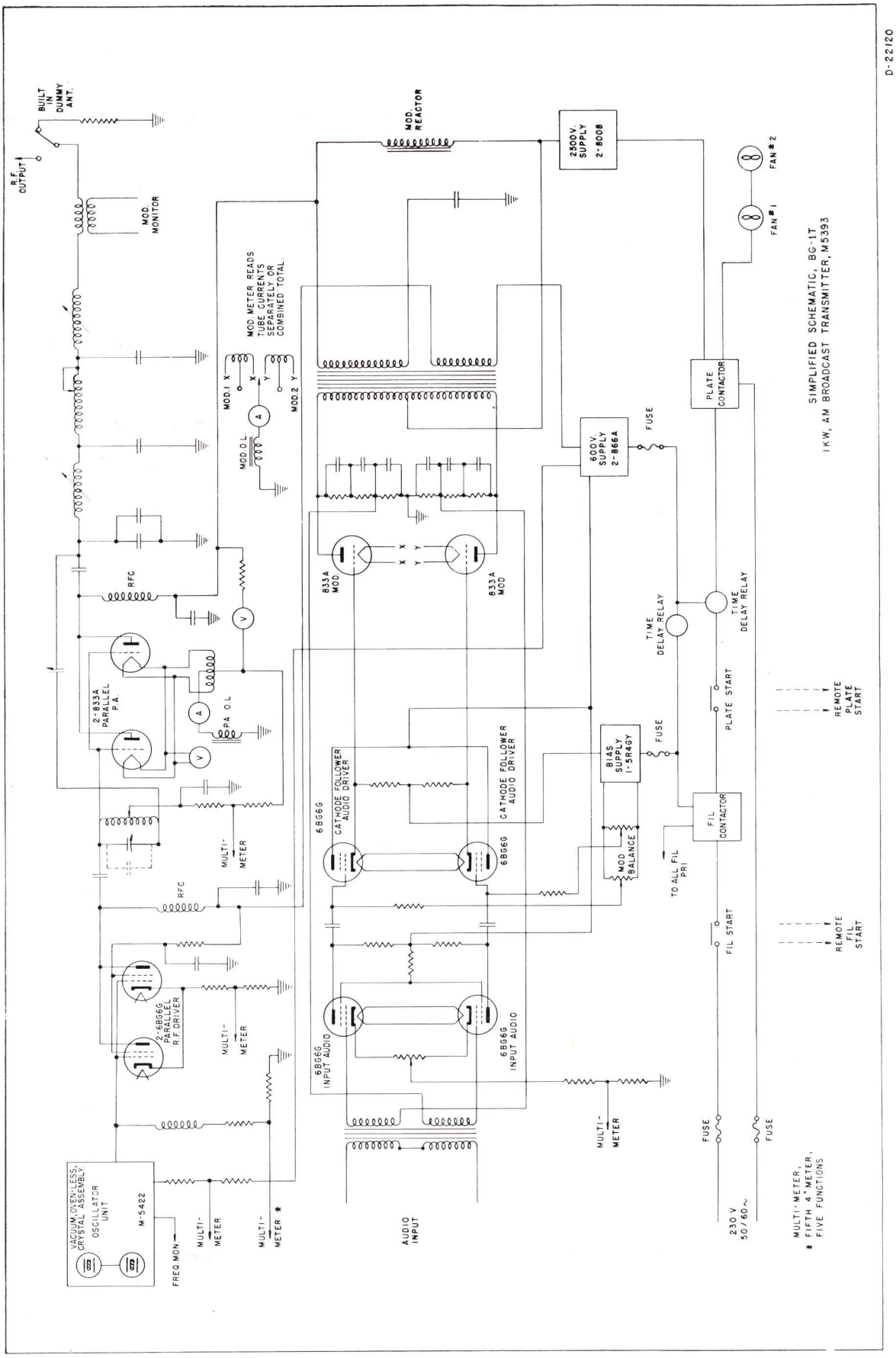


The clean electrical lines of the Gates BC-1T transmitter assures ease of servicing never before attained. Parts stacking is entirely absent.

COOLING: Across the bottom front is a full width grill behind which is a replaceable air filter. In the top of the cabinet are two quiet operating suction fans. One of these

(continued on Page 47)

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Functional diagram of the Gates BC-1T, 1000 watt transmitter, has been simplified for easy reading.

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GENERAL DESCRIPTION MODEL BC-1T

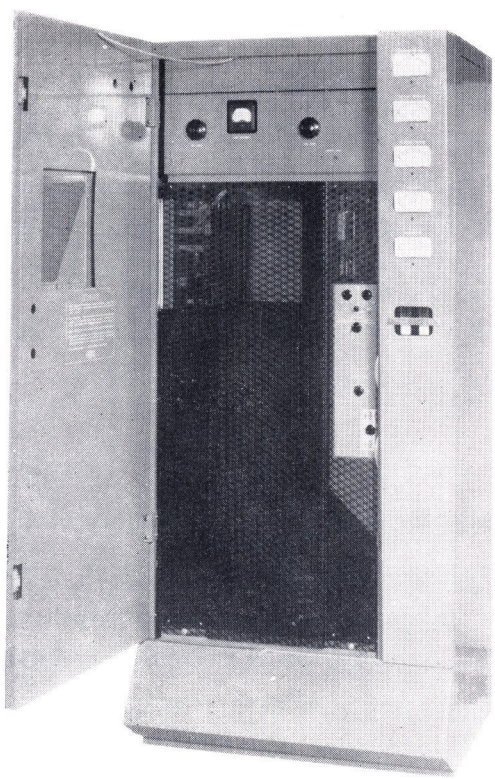
COOLING (continued)

is directly over the power tube section. The other removes all other air. By observing the inner BC-1T construction, the engineer will note all components, large and small, are in the exact circulating air stream. BC-1T cooling has been as much of the engineering consideration as the outstanding electrical design.

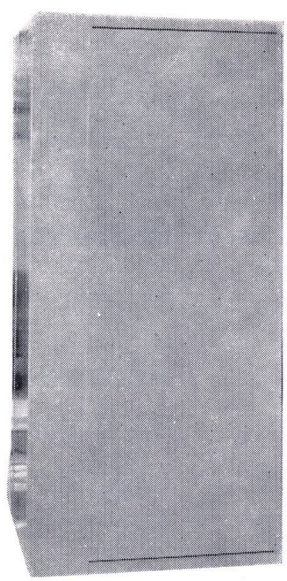
METERING: The five wide-face 4" meters read every necessary measurable circuit. Individual meters continuously read plate volts, PA plate current, filament volts and modulator current. The fifth meter, a multi-meter, is switch selectable to grid and cathode circuits over the entire transmitter. Individual modulator plates may be observed by a key that switches the modulator current meter to either tube. When this key is in the center, both tubes are metered. — A 0-8 RF line meter is mounted at the top center. — The question may be asked as to reaching meters for servicing. The front shield does not hold the meters. This shield is speedily removable and all meters are 100% accessible.

RF SECTION: Dual vacuum type crystal units require no temperature oven for pin-point stability. Frequency adjustment and crystal changeover is from the front. There are four RF stages, with all stages self-neutralized except the last. Dual long-life 833A tubes feed 1000 watts into a complete Tee network for exact loading and harmonic attenuation. The final amplifier and Tee network are tuned by variable coils of the large edgewise type, manu-

(continued next page)



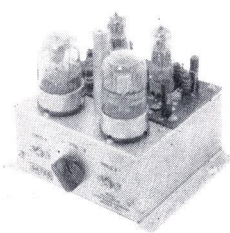
Open the front door and every tuning control is at finger tip, plus an interlocked perforated grill to observe every transmitter component from top to bottom.



The back, though removable, is only necessary as an enclosure. Complete access is from the front.

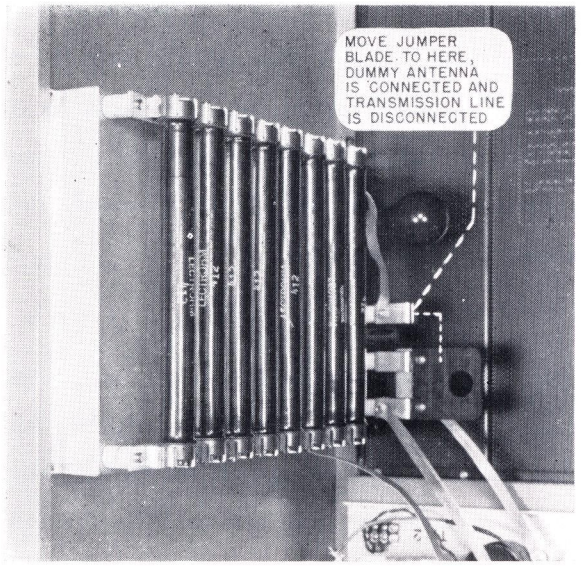


Open and closed views of the new ovenless, low drift crystal oscillator — first IPA unit.

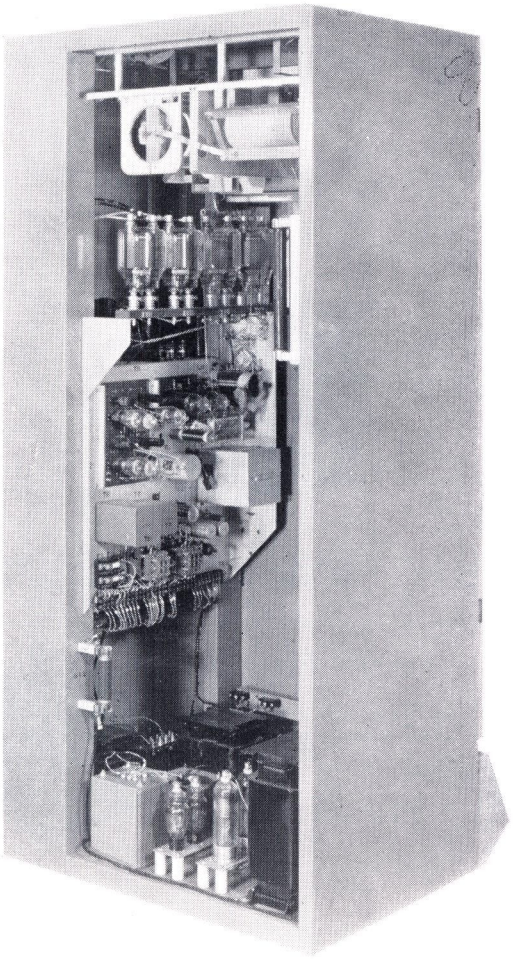


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GENERAL DESCRIPTION MODEL BC-1T



Inbuilt dummy antenna is standard equipment and becomes the engineer's third arm.



Full length rear view of the **BC-1T** transmitter. The design radiates confidence.

RF SECTION (continued)

factured by Gates. A portion of the audio is applied to the final RF driver plate to provide linear RF drive under modulation for improved performance and ease of modulating. The oscillator-IPA unit and RF driver section incorporate printed wiring throughout.

AUDIO SECTION has three stages, all push-pull. The cathode follower driver stage has dual 6BG6G tubes, a heavier tube similar to the 807. The modulation transformer has been designed for extremely low leakage for superb high frequency performance. Typical production BC-1T transmitters continually indicate distortion under 2% at the critical 7000 cycle audio frequency. The modulation transformer has two secondary windings, one for high level modulating the Class C amplifier, the other for modulating the RF driver. A full sized modulation reactor is also employed. — cathode follower, feedback, all push-pull and new transformer design produces true high fidelity through wide response combined with lower than ever distortion for real **listenability.**

POWER SUPPLIES in proper design and distribution can contribute greatly to **listenability.** In the BC-1T, noise can be below 60 db. One husky, low voltage supply with dual 866A rectifiers delivers well filtered direct current to all stages except the RF power amplifier and modulators. The power tubes are devoted exclusively to the high voltage supply with full wave 8008 rectifiers. A third bias supply for the Class B modulators with individual bias rheostats completes a dependable, loafing type of power section.

MONITORS: The BC-1T transmitter will operate with all current makes of frequency and modulation monitors. A scramble wound pickup coil inductively couples the modulation monitor. The frequency monitor connects to the 1st IPA in the crystal oscillator section. A modern transmitter accessory cabinet including monitors and limiting amplifiers will be found listed elsewhere in this catalog, or the GY-1000B package will be found immediately following these pages.

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GATES

BC-1T SPECIFICATIONS

POWER OUTPUT: Rated 1000 watts. Capability 1100 watts.

AUDIO INPUT: +12 db ±2 db for 100% modulation at impedance choice of 150, 250 or 600 ohms.

AUDIO RESPONSE: ±1½ db 30-12,000 cycles.
(Typical: ±1½ db 30-16,000 cycles under practical programming conditions.)

AUDIO DISTORTION: 3% or less 50-10,000 cycles (at 95% modulation.)
(Typical: 2% or less 50-16,000 cycles under practical programming conditions.)

NOISE (unweighted): Below 100% modulation, rated 60 db, capable 65 db.

RF RANGE: 540 kc to 2000 kc, as ordered.

RF OUTPUT IMPEDANCE: 50/70 ohms*

FREQUENCY STABILITY: ±10 cycles.
(Typical: ±2 cycles.)

MONITOR IMPEDANCES: Will match all current makes of frequency and modulation monitors.

MODULATION: High level Class B.

POWER INPUT: 230 volts, 2 wire, 50/60 cycles from 2740 watts at zero modulation to 3940 watts at 100% modulation.

CARRIER SHIFT: 3% or less at 100% modulation.

DUMMY ANTENNA: 51½ ohms at 1000 watts 100% modulation.

TUBES: 12BY7A oscillator
12BY7A 1st IPA
(2) 6BG6G 2nd IPA
(2) 833A power amplifiers
(2) 6BG6G 1st audio
(2) 6BG6G 2nd audio
(2) 833A modulators
5R4GY rectifier
(2) 866A LV rectifiers
(2) 8008 HV rectifiers

Total number of tubes: 17

Total tube types: 6

SIZE: 78" high, 36" wide, 32" deep. Front door swing 28". Floor space 8 sq. ft.

WEIGHT: 800 lbs. net. 1090 lbs. packed. Cubage, 61. Export, 1500 lbs. estimated packed. Cubage, 110.0.

*For other impedances, refer to antenna couplers (see Index).

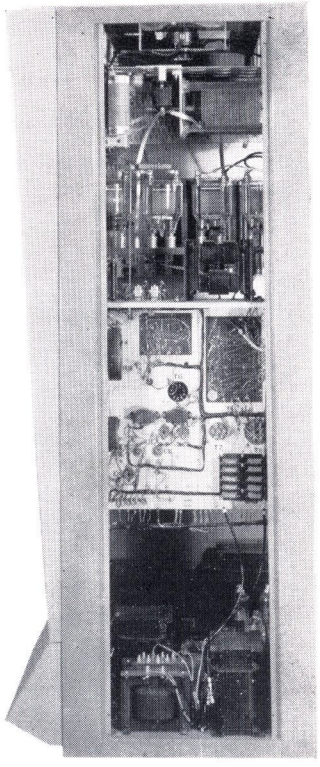
HI-FI-QUALITY

This transmitter is "Hi-Fi-Quality", an advancement over high fidelity. "Hi-Fi-Quality" is the combination of three components: (1) extremely wide frequency response, (2) very low distortion over a wide range under practical programming conditions, and (3) lower capable noise. The total of the three is "Hi-Fi-Quality" — the new **quality sound** in radio broadcasting.

ORDERING INFORMATION

1000 watt transmitter complete with tubes, one crystal, dummy antenna and ready to operate	**BC-1T**
Extra crystal and vacuum holder	**M-5602**
100% spare tube complement for BC-1T	**TK-287**
FCC required spare tube complement for BC-1T	**TK-288**

NOTE: Be sure and specify carrier frequency when ordering. Other line voltages available on special order without delay.



Side of BC-1T removes to expose the few components not accessible from the front. Reaching every part is an engineering must in Gates transmitters.

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MODEL 500T 500 WATT BROADCAST TRANSMITTER



This modern 500 watt model is in all respects, except where modified for 500 watt service, the same transmitter as the BC-1T, 1000 watt model on the preceding pages. — Step up to 1000 watts, at any later date, may be done quickly and effectively. BC-500T is another entirely new transmitter in the continuing parade of progressive Gates equipment.

As the basic description of the BC-500T transmitter is the same as Model BC-1T, the following pages cover information pertinent to the BC-500T and for all other descriptive data the reader is asked to refer to Model BC-1T.

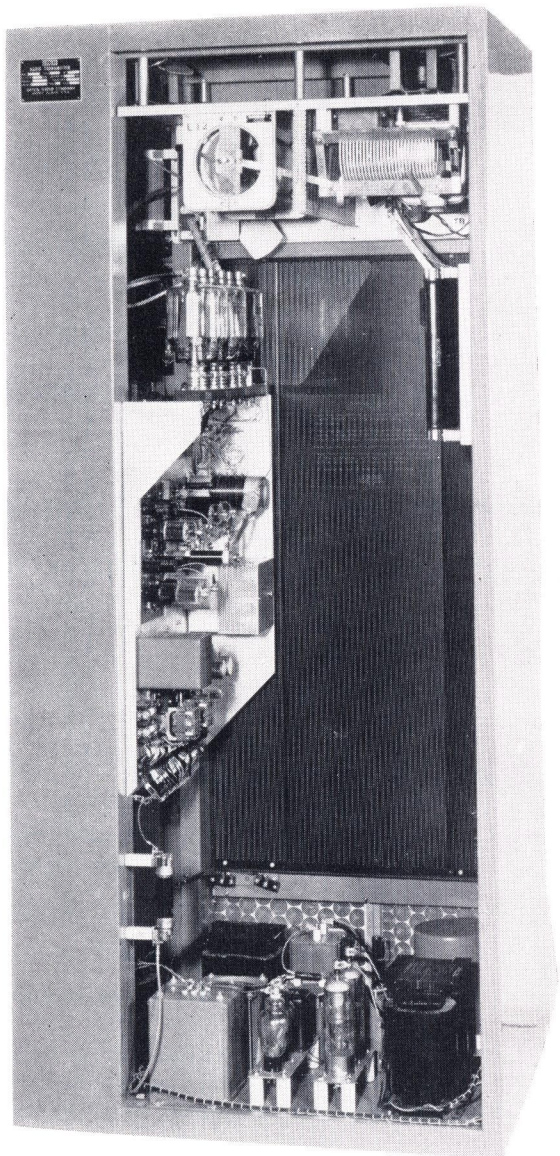
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GATES

GENERAL DESCRIPTION
(Model BC-500T)

In standardization of manufacturing processes, the BC-500T transmitter is produced on the same line and with most of the same components as the BC-1T, 1000 watt model. Modification of the BC-1T to become the BC-500T consists of only the necessary basic changes to meet FCC requirements along with proper power, modulation and reactor transformer sizes.

For metering, local-remote control, cooling, general construction, audio section and other data common with BC-500T to the BC-1T, reference to the BC-1T on preceding pages will not only provide the desired information but emphasize the 1000 watt basic design of this modern 500 watt model.



This is BC-500T from the rear. Modern design and husky construction spells confidence for the heaviest broadcasting schedule.

RADIO FREQUENCY SECTION: Identical in all respects to Model BC-1T other than a single 833A power amplifier tube is employed.

AUDIO FREQUENCY SECTION: Identical in every way to that in the BC-1T other than the modulation transformer and reactor are of 500 watt size.

POWER SUPPLY SECTION: The power transformer and filter reactors are of 500 watt size in the high voltage supply. The balance is BC-1T 1000 watt design.

METERING for BC-500T is changed to accommodate a 0-5 RF ammeter and a lower range PA plate current meter to meet FCC requirements.

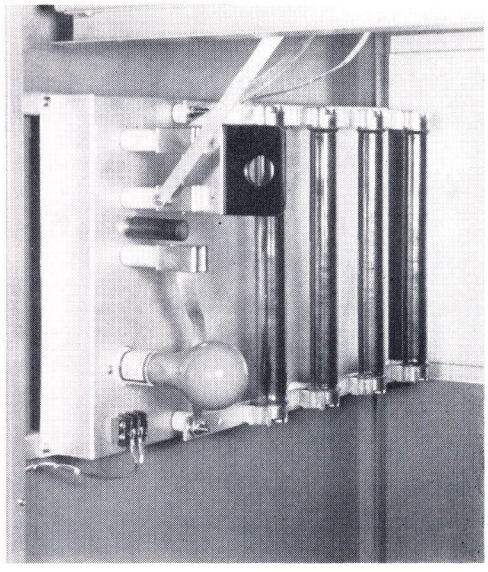
OFF AIR TESTING provides the inbuilt dummy antenna for 500 watts 100% modulated. Move the switch bar to "Dummy" and you may test any time. New stations may finish tests prior to even erection of the antenna tower. — For regular maintenance, this feature will save hours of time and add greatly to performance through convenience of routine maintenance. **Construction** is identical to the BC-1T transmitter.

PRINTED WIRING as in BC-1T is the same.

LOCAL-REMOTE CONTROL system in BC-500T is the same relay system as in the BC-1T. No circuit breakers are employed.

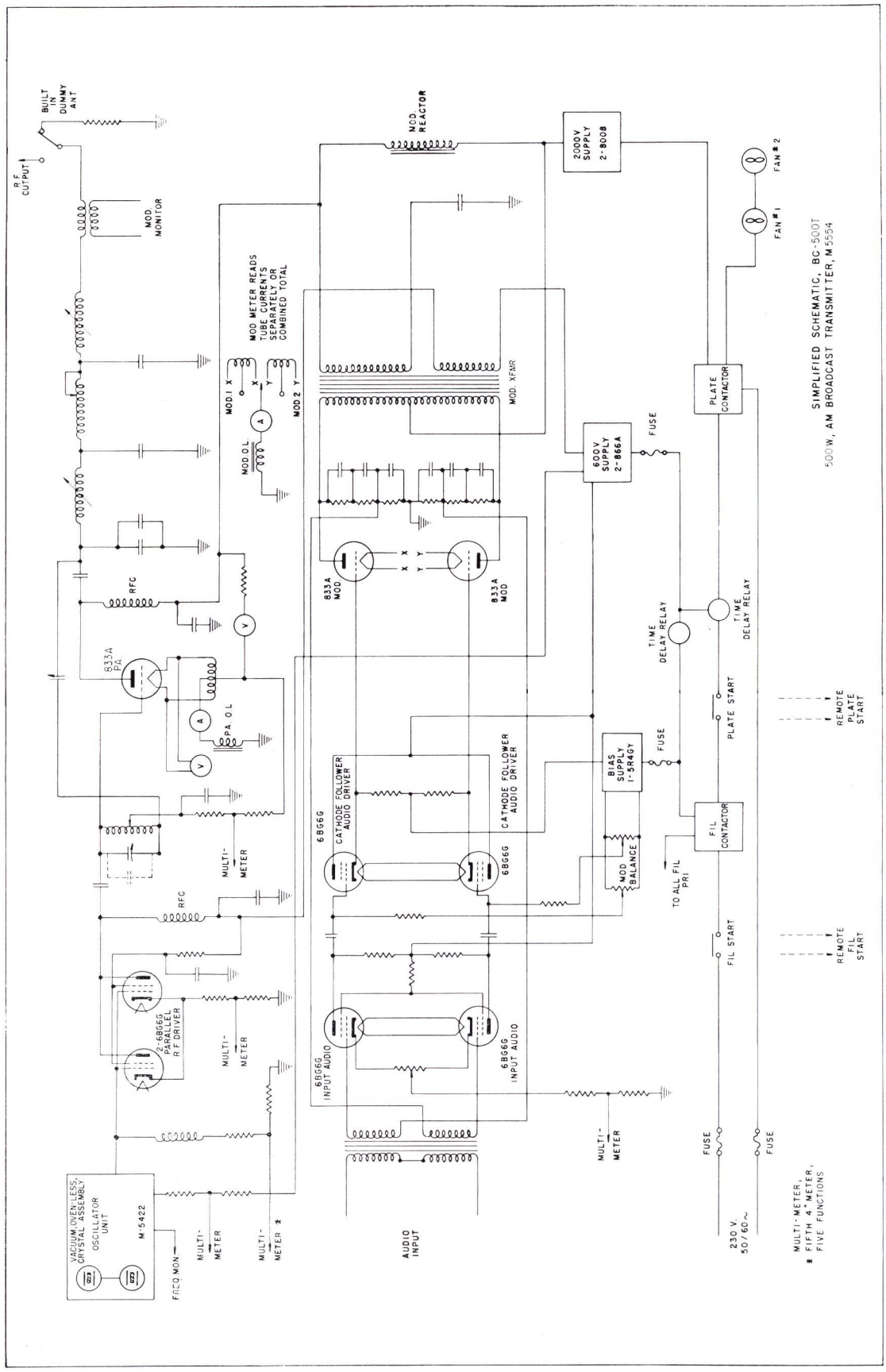
COOLING includes full width filtered air intake at the bottom and dual exhaust fans at the top. Same as Model BC-1T.

PERFORMANCE: The owner of BC-500T has without question an ultra-conservative transmitter when basic 1KW design is followed. Tube life, especially that of the larger tubes, should be extra gratifying.



Standard equipment in BC-500T is the inbuilt dummy antenna. Routine maintenance now becomes a pleasure.

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Functional diagram of the BC-500T, 500 watt broadcast transmitter. Cathode follower, overall feedback, new low leakage transformer design and modulation of the RF driver amplifier, along with the Class C amplifier, produces real fidelity through lower distortion.

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GATES

BC-500T SPECIFICATIONS

POWER OUTPUT: Rated 500 watts.
Capability 600 watts.

AUDIO INPUT: +9 db ±2 db for 100% modulation at impedance choice of 150, 250 or 600 ohms.

AUDIO RESPONSE: ±1½ db 30-12,000 cycles.
(Typical: ±1½ db 30-16,000 cycles under practical programming conditions.)

AUDIO DISTORTION: 3% or less 50-10,000 cycles (95% modulation).
(Typical: 2% or less 50-16,000 cycles under practical programming conditions.)

NOISE (unweighted): Below 100% modulation, rated 60 db, capable 65 db.

RF RANGE: 540 kc to 2000 kc, as ordered.

RF OUTPUT IMPEDANCE: 50/70 ohms.*

FREQUENCY STABILITY: ±10 cycles.
(Typical: ±2 cycles.)

MONITOR IMPEDANCES: Will match all current makes of frequency and modulation monitors.

MODULATION: High level Class B.

POWER INPUT: 230 volts, 2 wire, 50/60 cycles from 1960 watts at zero modulation to 2660 watts at 100% modulation.

CARRIER SHIFT: 3% or less at 100% modulation.

DUMMY ANTENNA: 51½ ohms at 500 watts 100% modulation.

TUBES: 12BY7A oscillator.
12BY7A 1st IPA.
(2) 6BG6G 2nd IPA.
(1) 833A power amplifier.
(2) 6BG6G 1st audio.
(2) 6BG6G 2nd audio.
(2) 833A modulators.
5R4GY rectifier.
(2) 866A LV rectifiers.
(2) 8008 HV rectifiers.

Total number of tubes: 16.

Total tube types: 6.

SIZE: 78" high, 36" wide, 32" deep. Front door swing 28". Floor space 8 sq. ft.

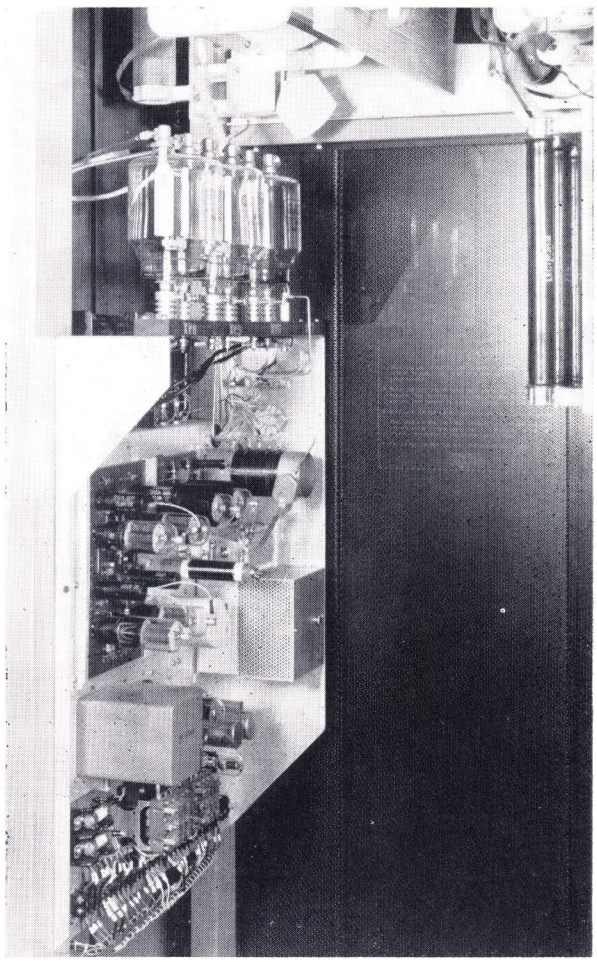
WEIGHT: 700 lbs. net. 990 lbs. packed. Cubage, 61. Export, 1400 lbs. estimated packed. Export cubage, 110.0.

* For other impedances, refer to antenna couplers (see Index).

ORDERING INFORMATION

500 watt transmitter complete with one set of tubes, dummy antenna and crystal	**B-500T**
Extra crystal with vacuum type holder	**M-5602**
100% spare tube kit for BC-500T	**TK-300**
FCC required spare tubes for BC-500T	**TK-307**
Conversion kit to change BC-500T transmitter to BC-1T 1000 watt transmitter, includes all necessary components, with purchaser retaining 500 watts components removed	**M-5614**

NOTE: State carrier frequency when ordering. Other primary voltages available on special order and without delay.



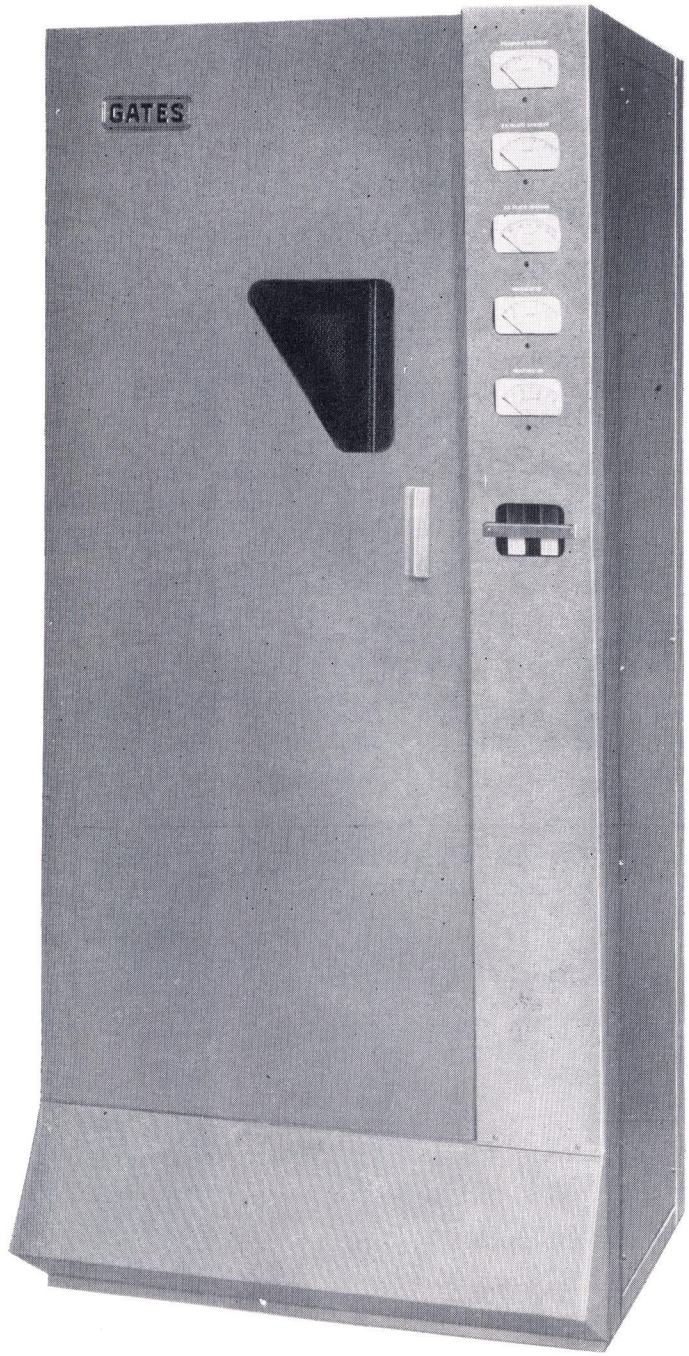
To the trained engineering eye, the sharp electrical lines illustrate the months of planning in BC-500T design.

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GATES

MODEL BC-250T 250 WATT BROADCAST TRANSMITTER

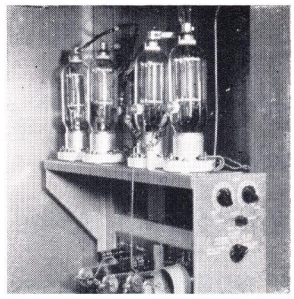
(with power step up design)



Model BC-250T is a basic 1000 watt design modified and fully FCC approved for 250 watt operation. Broadcasters now operating on 250 watts with an eye to future higher power, may immediately own an ultra conservative 250 watt equipment and step up later to 500 or 1000 watts by purchasing a "power increase kit". — Change to higher power can be made in 2 hours' time, resulting in a fully FCC approved higher powered model.

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Model BC-250T

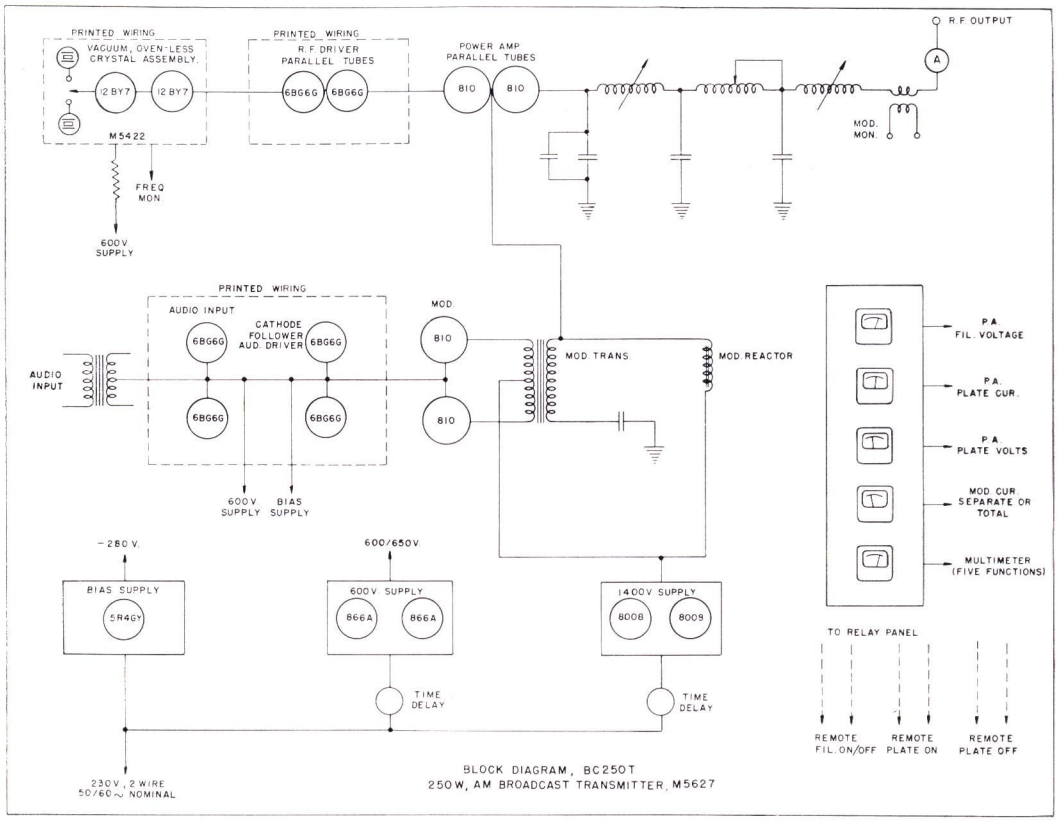


This model is offered the broadcast industry to fill future expansions as well as the most conservative 250 watt equipment ever offered. — Actually the BC-250T transmitter is a model BC-1T, 1000 watt design, fully described on Pages 42-49, with certain minor changes to meet 250 watt FCC and engineering requirements. So similar are the designs, the reader may obtain basic data by reading BC-1T descriptive matter.

Four 810 tubes in the 250 watt model replace the 833A tubes in higher powered models. Even here the tube socket chassis are interchangeable and wiring to either the 810 or 833A tubes is the same. Power, modulation, filter and reactor transformers, filter capacitors and mica tank capacitors are specifically for the 250 watt model. All other components are the same in the 250 watt BC-250T, 500 watt BC-500T or 1000 watt BC-1T. — Such items as tank coils, Tee-network coils, intermediate power supplies, metering, protective relays, insulation, cabinet design, oscillator and intermediate power amplifier are identical in the BC-250T transmitter to that of higher powered models.

If you increase power later, order the "power increase kit" for 500 or 1000 watts as listed on Page 56 and you may start the following day's broadcasting at higher power. — If, on the other hand, you never increase power, your broadcasting station will own the most conservative and reliable 250 watt equipment ever built.

Simplified schematic diagram of the Gates BC-250T transmitter. Basic 1000 watt design is employed throughout.



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GATES

MODEL BC-250T SPECIFICATIONS

POWER OUTPUT: Rated 250 watts. Capable 300 watts.

MODULATION: High level Class B.

RF FREQUENCY RANGE: 540-2000 Kc.

RF OUTPUT: Full Tee-network variable coil tuning to match 50-75 ohms. Please refer to antenna couplers, Pages 81 and 82.

RF STABILITY: Rated ±10 cycles. (Typical: ±2 cycles). Vacuum mounted, ovenless crystals (provision for 2) used throughout.

CARRIER SHIFT: 3% or less 0-100% modulation.

AUDIO INPUT: 150/250 or 500/600 ohms at +8 dbm for 100% modulation.

AUDIO RESPONSE: ±1½ db, 30-12,000 cycles.
(Typical: ±1½ db 30-16,000 cycles under practical programming conditions.)

NOISE: 60 db or better below 100% modulation.

DISTORTION: 3% or less, 50-10,000 cycles. (At 95% modulation).
(Typical: 2% or less 50-16,000 cycles under practical programming conditions).

TUBES: 12BY7A oscillator, 12BY7A first IPA, (2) 6BG6G second IPA, (2) 810 power amplifier, (2) 6BG6G first audio, (2) 6BG6G cathode follower drivers, (2) 810 modulators, (2) 866A intermediate power rectifiers, (2) 8008 main power rectifiers, (1) 5R4GY bias rectifier.
Total tubes, 17.
Total tube types, 6.

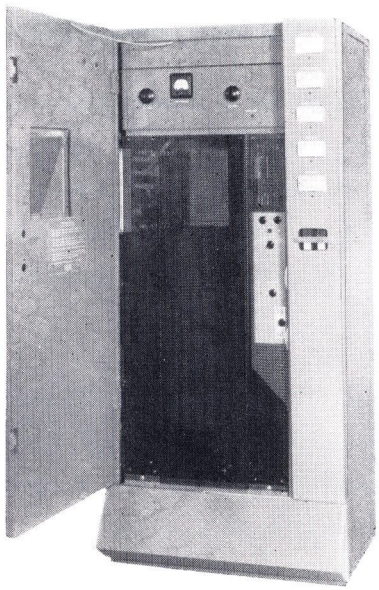
VENTILATION: Convex through wide bottom front grill.

SIZE: 78" high, 36" wide, 32" deep. Front door swing 28".*
Floor space, 8 sq. ft.

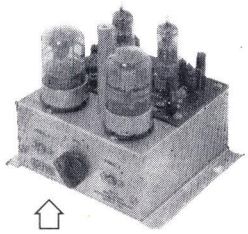
WEIGHT: Net 750 lbs. Packed 1070 lbs. Cubage 71.

FINISH: Medium hand rubbed gloss gray in two tones.

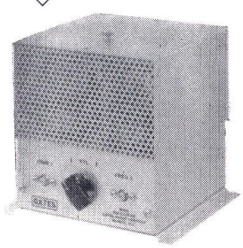
* Back and side removable. As design is for 100% service from the front, transmitter may be located near or against back wall.

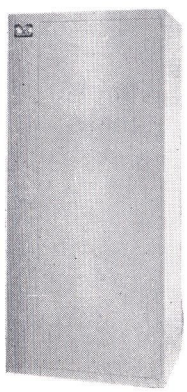


Open BC-250T front door to reach all tuning controls. Slip off the snap on interlock perforated grill to reach all parts from the front. BC-250T is the only transmitter manufactured today with complete parts visability during operation.



Dual vacuum mounted crystals are designed into a new oscillator with the emphasis on stability and dependability.





The back is removable but you will never need to with BC-250T as all servicing is from the front.

ORDERING INFORMATION

Complete 250 watt transmitter with one set of tubes, one crystal and 0-3 line meter**	**BC-250T**
100% spare tube kit for above	**TK-306**
FCC spare tube kit for above	**TK-307**
Spare crystal and vacuum holder for above	**A-30866**
Power increase kit to increase from 250 to 500 watts***	**M-5637**
Power increase kit to increase from 250 to 1000 watts***	**M-5638**

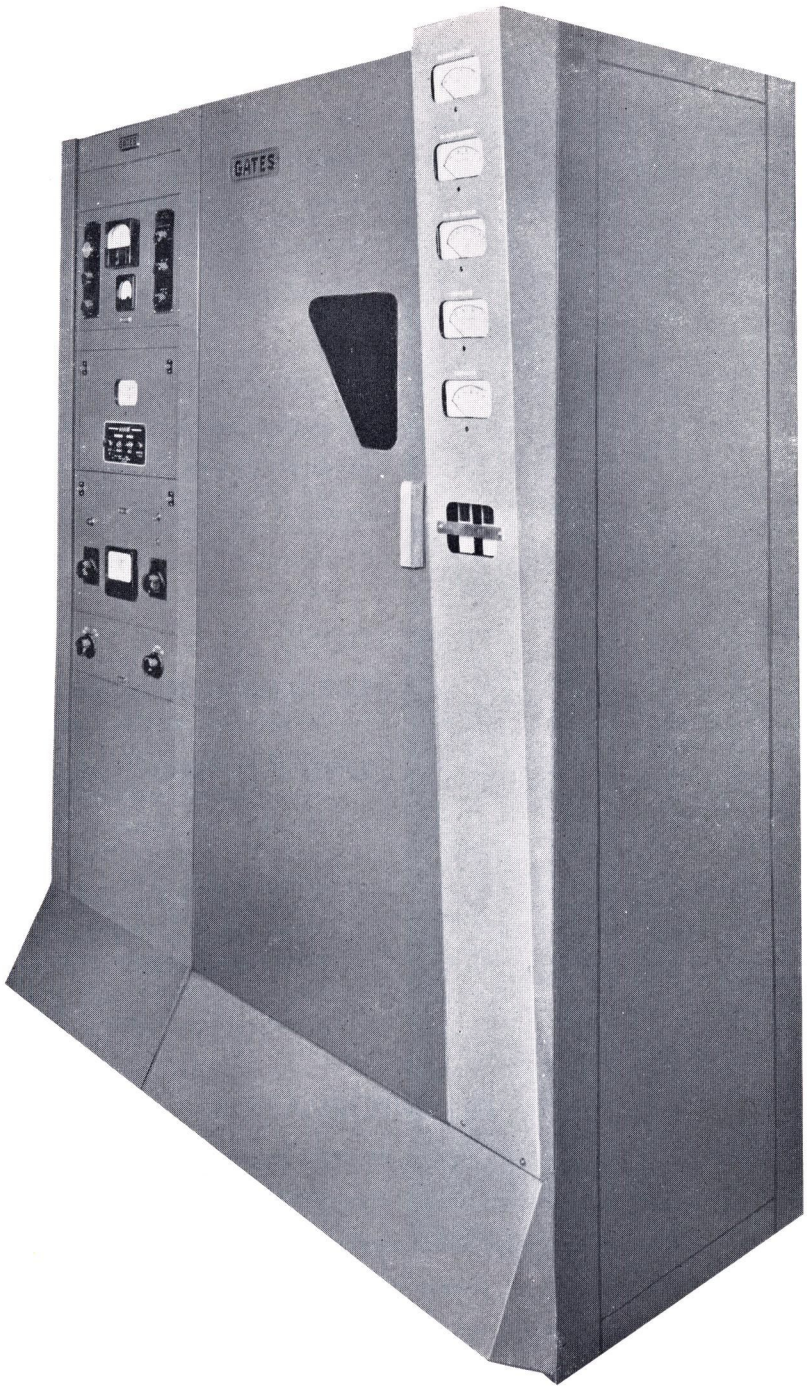
** Please state frequency and line impedance when ordering.

*** Includes all necessary components and tubes excluding crystal. Price is based on customer returning lower power components removed, except tubes.

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GATES

PACKAGED RADIO BROADCASTING EQUIPMENT



These three models of complete radio stations are ready to attach to studio and transmission lines. The 250 watt BC-250T, the 500 watt BC-500T or the 1000 watt BC-1T transmitters are joined with all necessary FCC approved monitors, audio equipment and with optional remote control apparatus. This equipment is mounted, wired and tested. Along with assured system performance is offered a most attractive and eye-catching broadcasting equipment installation.

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GATES

PACKAGED RADIO BROADCASTING EQUIPMENT

(for 1000 and 500 watts ready to install)

For many years, the Gates complete packaged radio station has been very popular. Provided is everything necessary to attach studio equipment and transmission line to the antenna. Transmitter, monitors, audio equipment and remote control equipment, where used, is all packaged and ready to install. — The result is speedier installation through the purchase of a complete system. As wiring is complete, the installation engineer need not concern himself with the details ordinarily associated with piece by piece procurement.

The Gates modulation monitor has high level output for the monitoring speaker which may be any good quality speaker. Four input lines are switch selectable. A switch is also incorporated to bypass the limiting amplifier. In this manner an emergency tube change in the limiter does not necessitate leaving the air.

All equipment components of the accessory cabinet are fully described on a near adjacent page (see Index "Accessory Cabinet"). Remote control equipment referred to herein is also covered in detail elsewhere in this catalog.

SPECIFICATIONS

TRANSMITTER: For 1000 watts, Model BC-1T.
For 500 watts, Model BC-500T.
For 250 watts, Model BC-250T.

MODULATION MONITOR: Gates MO-2639 (FCC approved).

FREQUENCY MONITOR: Gates M-4990 (FCC approved).

LIMITING AMPLIFIER: Gates SA-39B.

SWITCHING PANEL: 4 switch selectable 600 ohm inputs to limiter. One input selector switch to limiter or transmitter direct.

SIZE OVERALL (including transmitter): 78" high, 59½" wide, 32" deep.

REMOTE CONTROL (optional): Gates Model RDC-10 with transmitter unit mounted and wired in cabinet and studio unit ready to install in studios, includes plate current, plate voltage and tower light extension kits, also motor tuned power adjusting rheostat. Also includes modulation monitor and frequency monitor extension meters for studio installation, (see Index "Remote Control" for full detail).

ORDERING INFORMATION

Complete 1000 watt radio station with one set of tubes, crystal, less remote control	**GY-1000B**
Complete 1000 watt radio station with one set of tubes, crystal and with remote control	**GY-1000BRDC**
Complete 500 watt radio station with one set of tubes, crystal, less remote control	**GY-500B**
Complete 500 watt radio station with one set of tubes, crystal and with remote control	**GY-500BRDC**
Complete 250 watt radio station with one set of tubes, crystal, less remote control	**GY-250B**
Complete 250 watt radio station with one set of tubes, crystal and with remote control	**GY-250BRDC**

EQUIPMENT REFERENCES:

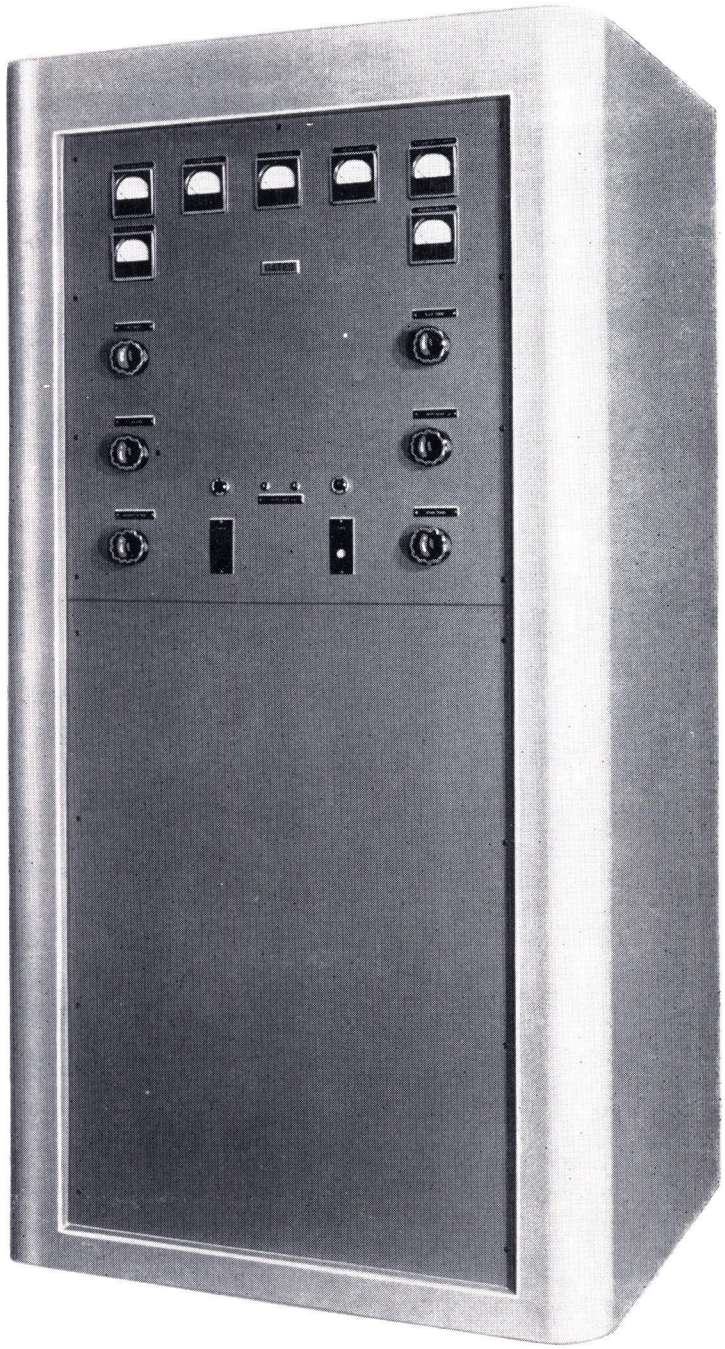
BC-1T transmitter . . . Page 42
BC-500T transmitter . . . Page 50
BC-250T transmitter . . . Page 54
M-4990 frequency monitor . . . Page 84
MO-2639 modulation monitor . . . Page 87
SA-39B limiting amplifier . . . Page 123

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GATES

BC-250GY 250 WATT BROADCAST TRANSMITTER

The Gates BC-250GY has a world-wide reputation for long trouble-free service, and is the most used 250 watt broadcast transmitter in America. Walk in to service, big component design and extra generous facilities. — The Gates BC-250GY transmitter is rightfully called, "The work horse of the broadcast industry." If the frequency allocation will never permit increase in power, this model BC-250GY is the proper selection.



CONSTRUCTION: In the BC-250GY transmitting plant is an assemblage of large heavy parts strategically placed for instantaneous accessibility. This, added to walk-in-to-service design, not only brings the admiration of the technical staff but spells cool, reliable operation. Generous spacing of components with the entire center of the cabinet free air, just naturally brings this result. Built in a cabinet 78" high, 40" wide and 33" deep and finished in hand rubbed gloss gray. Oscillator deck slips out in seconds if need be. Audio deck hinges out to reach under components. Full length hinged interlocked rear door is provided.

RADIO FREQUENCY: Three stages, provision for 2 crystals in temperature controlled ovens, 813 RF driver provides abundance of drive and long tube life, 2 type 810 single ended power amplifiers feed an output coupling network that will match specified impedances from 30 to 300 ohms.

AUDIO FREQUENCY: Two audio stages consist of push-pull 6L6's driving two 810 tubes operating as Class B high level modulators. Conservatively rated 810's in the modulator insure reliable operation and added tube life.

METERING: Eight meters, more than in any other 250 watt broadcast transmitter. Includes: oscillator plate, RF driver plate, PA grid, PA plate, plate volts, filament volts, modulator plate and RF output. There is no multi-metering in the BC-250GY transmitter.

POWER SUPPLIES: Two power supplies develop the high voltage, intermediate and bias voltages for the entire transmitter.

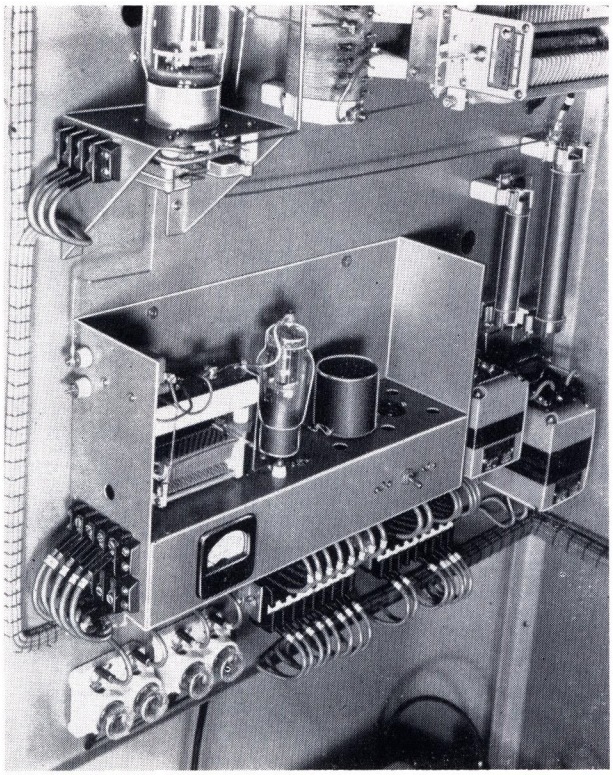
PROTECTIVE RELAYS: Like all Gates transmitters, relays largely replace circuit breakers. Adaption to remote control, as well as full protection is complete in this type design. Two overload relays for power amplifier and modulator are incorporated plus plate contactor relay and vacuum time delay relay. Ease of attaching remote control is self-evident.

POWER RESISTORS: All heavy sized power resistors are of the ferrule or plug-in type. This not only assures easy replacement but is indispensable for cleaning and assures no breakage during shipment.

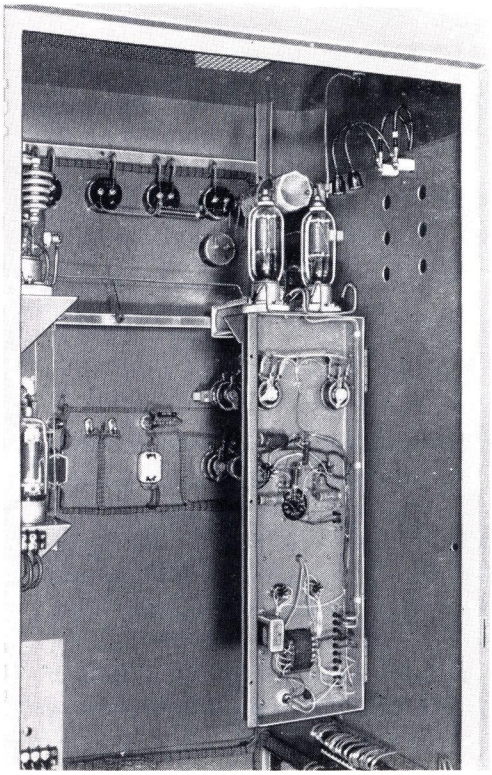
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GATES

BC-250GY 250-WATT BROADCAST TRANSMITTER



Oscillator unit (dust cover removed) accommodates two crystals and ovens, has its own tuning meter and may be removed in seconds.

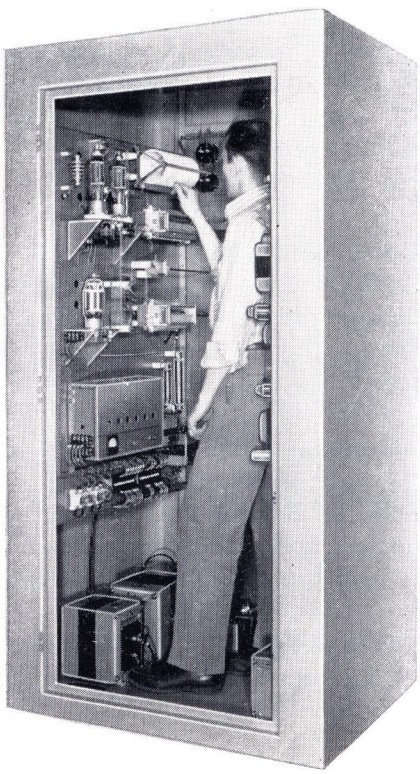


100% serviceability is always foremost in Gates designs. Here the audio deck hinges out to reach the under-chassis parts.

COOLING: As the large roomy design allows convex cooling, the absence of blowers or fans assures quiet operation. In properly treated room design operation may be near a microphone, though it is always recommended that the transmitter be isolated from operating procedures by a glass partition or similar.

TRANSFORMERS: As all Gates transmitters are designed for 50 and 60 cycle operation, the transformers must be built with larger core and coil sections. This offers extra conservatism to 60 cycle users and no waiting for 50 cycle users. Generally there are no multi-transformers or the load is divided through several filament transformers and filter reactors instead of combining.

PERFORMANCE: Low distortion and noise, wide frequency response and excellent stability, both RF and in regulation of the power supply, forms smooth sounding equipment that will delight musical audiences, and develop the rich full quality required in all programming.

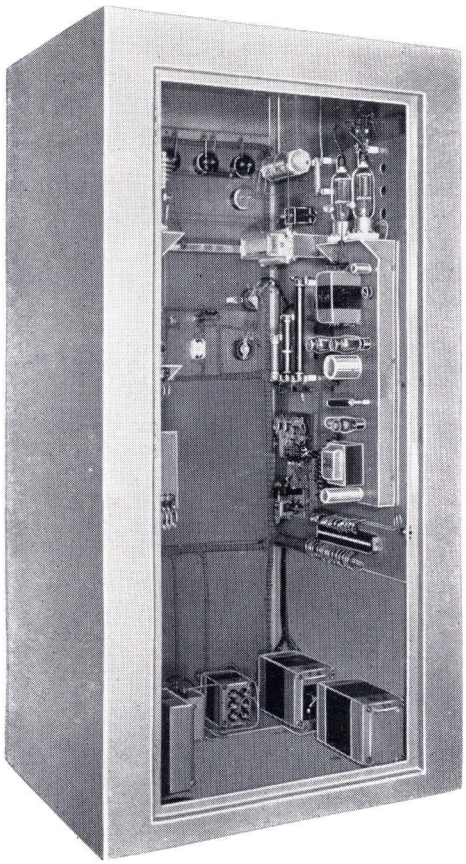


Rear illustration shows roomy big transmitter design with walk-in-to-service feature.

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GATES

BC-250-GY SPECIFICATIONS — ORDERING DATA



SPECIFICATIONS

RATED POWER OUTPUT: 250 watts.

CAPABLE POWER OUTPUT: 280 watts.

STABILITY: ±5 cycles.

FREQUENCY RESPONSE: At 90% modulation, 1 ±1½ db 30-10,000 cps. ±2 db 30-12,000 cps.

DISTORTION: 50-7500 cps 3% or less at 90% modulation.

NOISE: 60 db or better below 100% mod.

RF OUTPUT IMPEDANCE: 30-300 ohms (as ordered).

RF RANGE: 540-1600 Kc (as ordered).

AUDIO INPUT: 600 ohms balanced at +14 dbm ±2 db.

POWER INPUT: 230 volt, 2 wire, single phase.

POWER CONSUMPTION: 1.6 KW at 95% mod.

TUBES: 807 oscillator, 813 IPA, (2) 810 power amplifiers, (2) 6L6 (1622) audio drivers, (2) 810 Class B modulators, (2) 8008 rectifiers and 5Y4G rectifier.

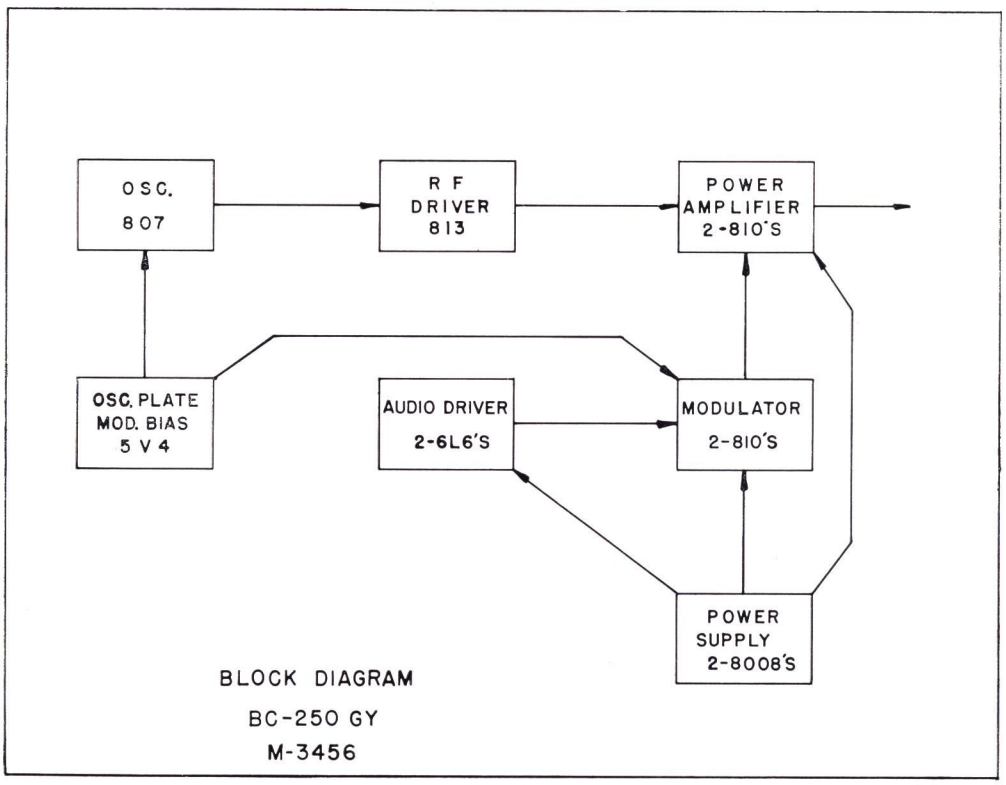
WEIGHT AND CUBAGE: 900 lbs. packed. Cubage, 112.

SIZE: 78" high, 40" wide, 33" deep. Rear door swing 32".

ORDERING INFORMATION

Complete 250 watt broadcast transmitter with one set of tubes, crystal and oven	**BC-250GY**
100% spare tube complement for BC-250GY transmitter	**M-3074**
FCC spare tube complement for BC-250GY transmitter	**TK-201**
Extra crystal and oven for BC-250GY transmitter	**JK57M**

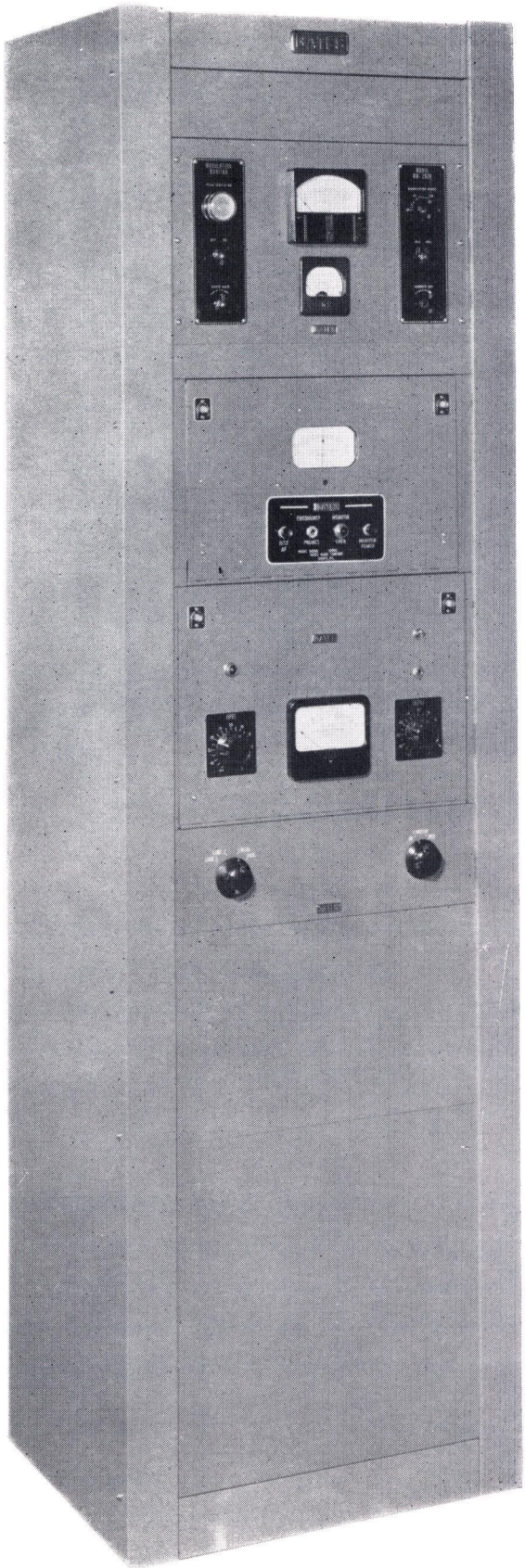
NOTE: **Be sure to state carrier frequency and RF output impedance when ordering. For monitors, antenna couplers and other accessories, please refer to Index in back of catalog.**



BLOCK DIAGRAM
BC-250 GY
M-3456

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GATES



ACCESSORY CABINET FOR RADIO BROADCAST TRANSMITTERS

(Model GY-60B)

All the necessary accessories to meet FCC requirements and good operating practice will be found in this cabinet. — At the top is the Gates FCC approved MO-2639 modulation monitor and under this is the FCC approved M-4990 frequency monitor. Next in line is the SA-39B limiting amplifier, directly under which is the input switching panel. The switching panel accommodates two telephone lines, a local and auxiliary input (four in all) at 600 ohms. A second switch allows bypassing the limiting amplifier for emergency tube change in the limiter, etc.

More than ample blank panel space is provided in the lower section of the cabinet for incorporation of remote control equipment for unattended operation or any other desired accessory. The GY-60B accessory cabinet is completely wired, including coaxial cables to terminate the frequency and modulation monitors.

Cabinet size, design and finish are compatible to all Gates broadcast transmitters. A full length rear door assures easy access. Use of this equipment offers the definite advantages of time saving during installation, proven performance of these accessories as a package and the attractive commercial appearance so necessary in today's modern era where visitor and worker admire equally a job well done.

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SPECIFICATIONS GY-60B

MODULATION MONITOR: Gates Model MO-2639, fully FCC approved.*

LOUDSPEAKER OUTPUT: 8 ohms from modulation monitor for direct off the air monitoring.

FREQUENCY MONITOR: Gates Model M-4990, fully FCC approved.*

LIMITING AMPLIFIER: Gates Model SA-39B. Input and output impedances, 500/600 ohms.

SWITCHING PANEL: Four switch selected 500/600 ohm inputs, two for line input, one for local input such as microphone preamplifier, and one for auxiliary input such as turntable. Second switch is for bypassing limiting amplifier for on-air maintenance.

POWER INPUT: 115 volts, 50/60 cycles, approximately 390 watts.

FINISH: Two-tone gloss gray with escutcheons in anodized black.

SIZE: 78" high, 23½" wide, 19½" deep. Rear door swing 20".

WEIGHT: Net 290 lbs. Packed 405 lbs.

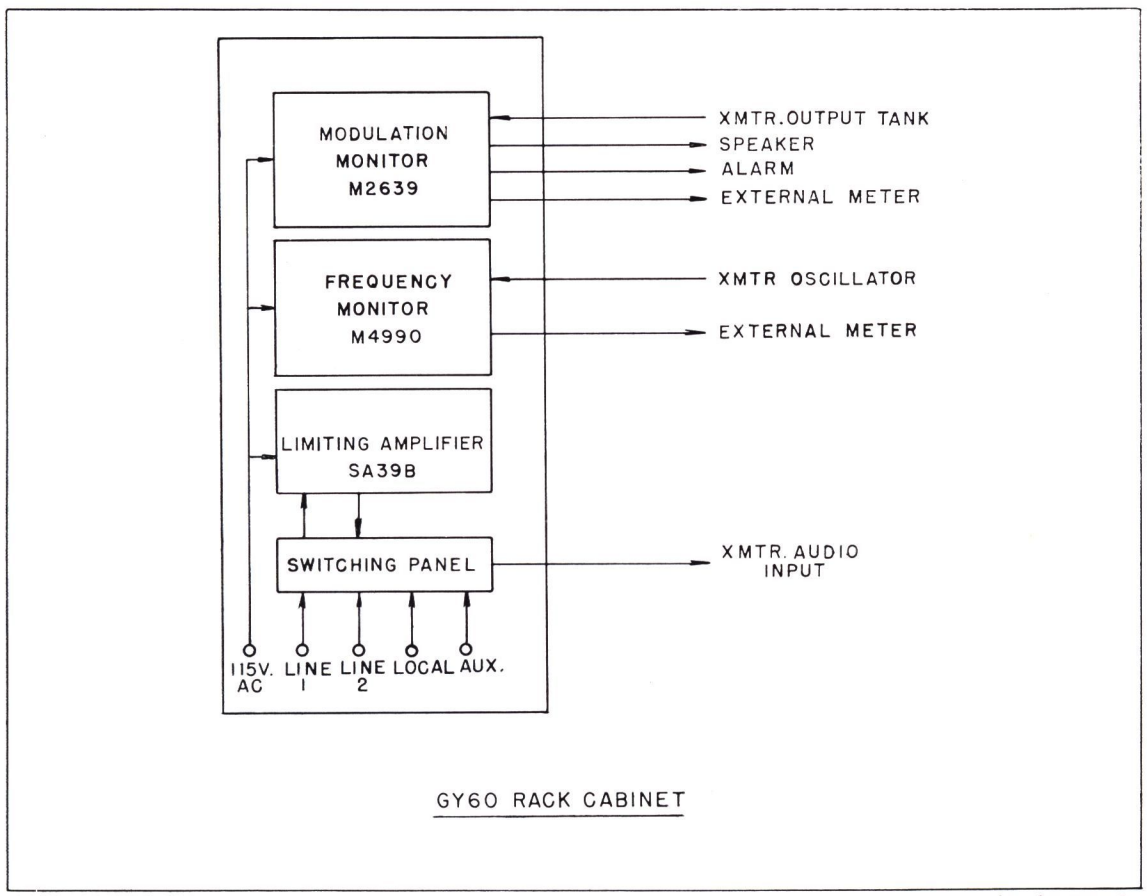
CUBAGE: 31.

* Fully described elsewhere in this catalog. Please refer to Index.

ORDERING INFORMATION

Complete accessory cabinet with one set of tubes **GY-60B**

100% spare tube kit for GY-60B **TK-302**

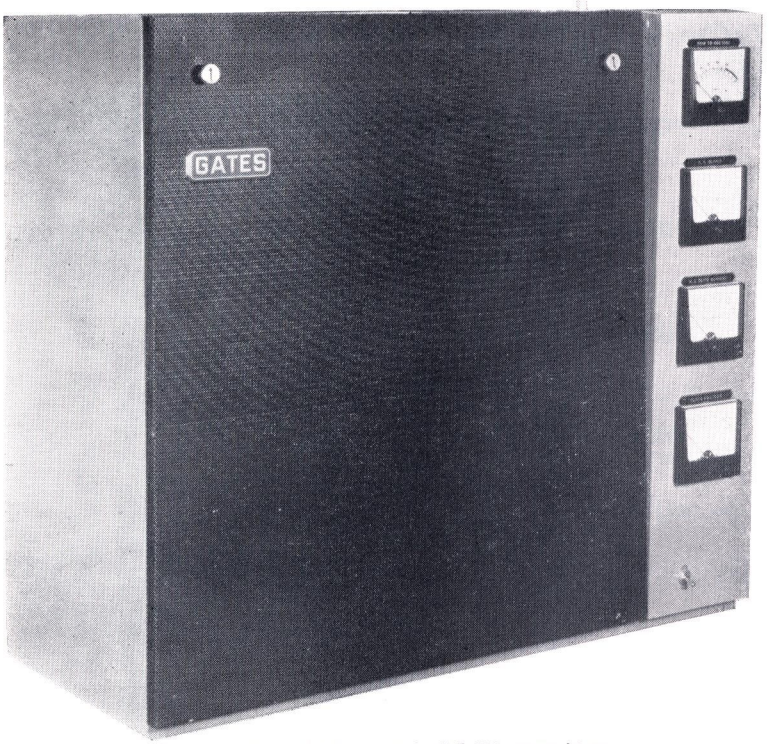


GY60 RACK CABINET

A-C30745

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GATES



Front of Models BF-E-10B and BF-E-50B transmitters.
Removable perforated cover screen allows full visibility with component protection.

10 WATT AND 50 WATT FM RADIO TRANSMITTERS FOR BROADCASTING

(with multiplex optional)

— **Approved for educational FM broadcasting 88-108 Mc.**

— **FM link service*.**

— **40-220 Mc model** (Page 205).

— **100% self-contained.**

— **Entirely new.**

* In most countries but not U. S. A.

Two smart all new transmitters for low power FM broadcasting provide higher performance standards than ever before in a mode of broadcasting synonymous with quality transmission.

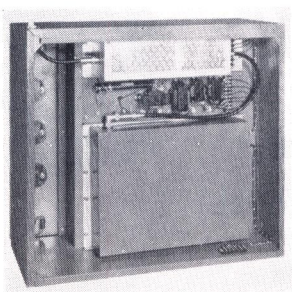
Basic in all Gates FM transmitters up to 5000 watts is the M-5534 ten-watt exciter unit. This exciter is detailed in the block diagram on Page 65 and is 100% new in circuit and component design with multiplex as an optional plug-in accessory (see Page 70). A new low in distortion has been obtained after long research in both circuitry and associated components. Inexpensive type tubes are employed and when replaced, no retuning is necessary for maximum performance.

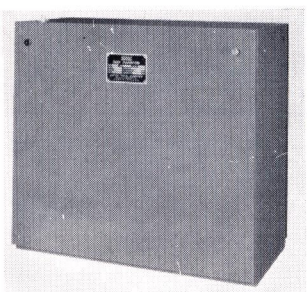
MODEL BF-E-10B: Primarily for educational broadcasting but with many other interesting applications. Ten watts output and meets all FCC requirements including RF output indicator and audio level meter adjustable to 100% modulation. Operates 88-108 Mc.

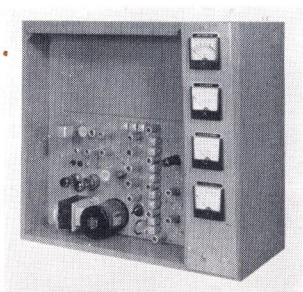
MODEL BF-E-50B: Quite similar to the BF-E-10B but with a 50-watt power amplifier added, along with additional power supply. Has RF output indicator and audio level meter. Operates 88-108 Mc.

MODEL BF-R-50C: For many relay, communications and link service in the 40-220 Mc range, this model is very similar to the BF-E-50B and is listed on Page 205.

From left to right: (1) Rear view of BF-E-50B and BF-R-50C transmitters, (2) rear closed view of all three models, (3) front view (cover removed) of BF-E-10B ten-watt model.







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SPECIFICATIONS

POWER OUTPUT: BF-E-10B, ten watts. BF-E-50B, fifty watts

FREQUENCY RANGE: 88-108 Mc, as ordered.

RF OUTPUT: 51 ohms (Type N connector).

OSCILLATOR: Direct crystal controlled, 0.001% stability.

MODULATION: Phase shift, employing pulse techniques.

FREQUENCY SWING: ±100 Kc. (±75 Kc=100% modulation in FM broadcasting).

INPUT: +10 dbm ±2 db at 600 ohms impedance.

RESPONSE: Within 1 db of standard 75 microsecond pre-emphasis curve or flat ±1 db, 50-15,000 cycles, as desired. (If preference, state when ordering.)

DISTORTION: 1% or less 50-100 cycles.
½% or less 100-10,000 cycles.
1% or less 10,000-15,000 cycles.

NOISE: 65 db below 100% modulation (FM).
60 db below equivalent 100% AM modulation.

METERING: RF output, audio level, plate current, plate voltage.

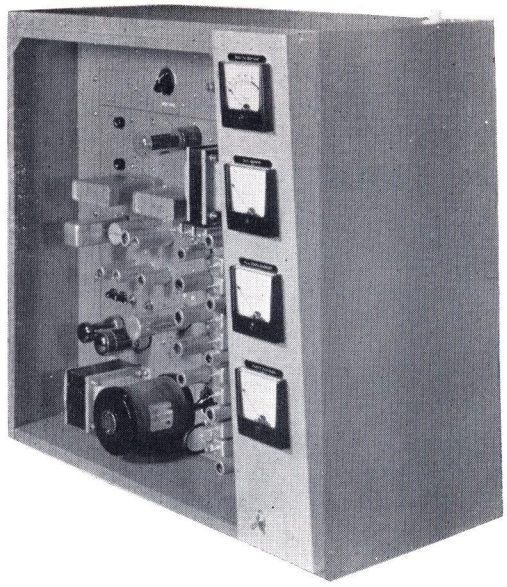
POWER: 115 volts, 50/60 cycles. BF-E-10B, 120 watts. BF-E-50B, 230 watts.

RF HARMONICS: Suppression meets or exceeds all FCC requirements.

TUBES: BF-E-10B — (7) 6AU6, (4) 12AX7, (3) 6J6, (2) OA2, and one each 6AQ5, GZ34/5AR4, 6080, 6360.
BF-E-50B — Same as above, with (2) 6146 and (1) 5R4GYA tubes added.

SIZE: 26½" high, 28" wide, 14" deep.

WEIGHT: BF-E-10B — Packed 115 lbs. Cubage 8.5.
BF-E-50B — Packed 165 lbs. Cubage 8.5.



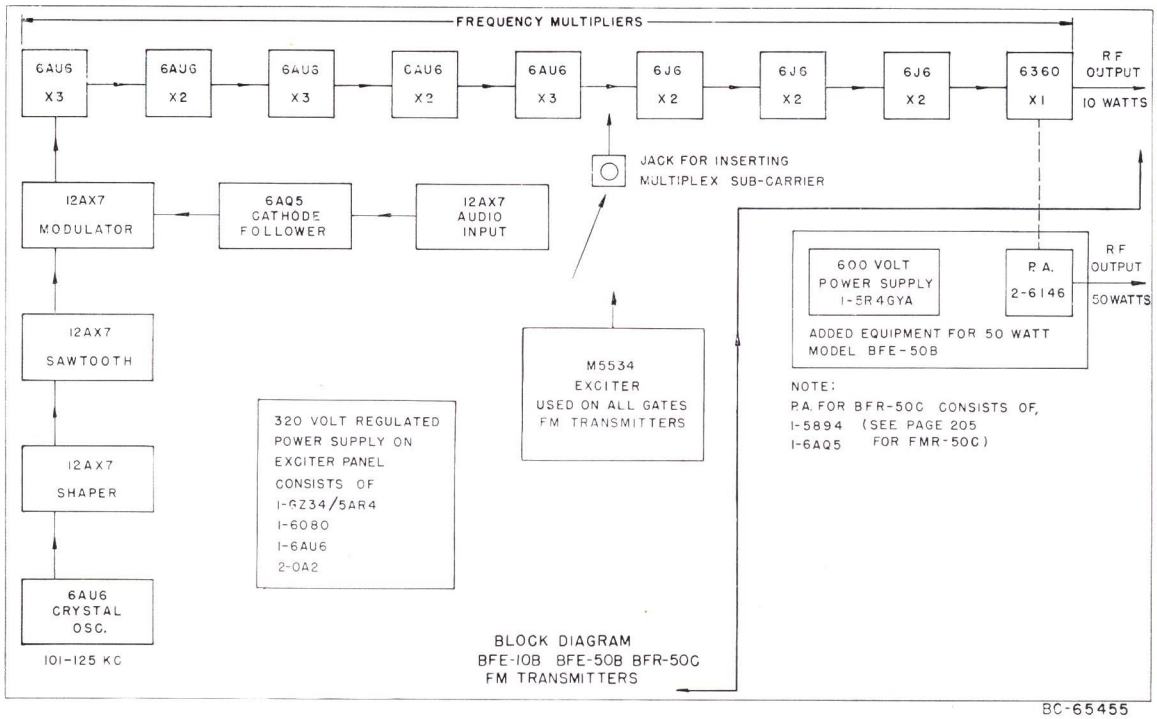
Inner front view (cover removed) of BF-R-50C and BF-E-50C fifty-watt FM transmitters.

ORDERING INFORMATION

Ten watt FM transmitter with tubes and crystal	**BF-E-10B**
Fifty watt FM transmitter with tubes and crystal	**BF-E-50B**
100% spare tube kit for BF-E-10B	**TK-308**
100% spare tube kit for BF-E-50B	**TK-309**
Multiplex single sub-channel	**M-5633A**
Multiplex dual sub-channel	**M-5633**

When ordering, state carrier frequency. If multiplex ordered, state sub-carrier frequency or frequencies as related to receivers to be used.

Block schematic of BF-E-10B, BF-E-50B and BF-R-50C transmitters.
The M-5534 exciter (part of these transmitters) is basic for all FM models including 5000 watts.

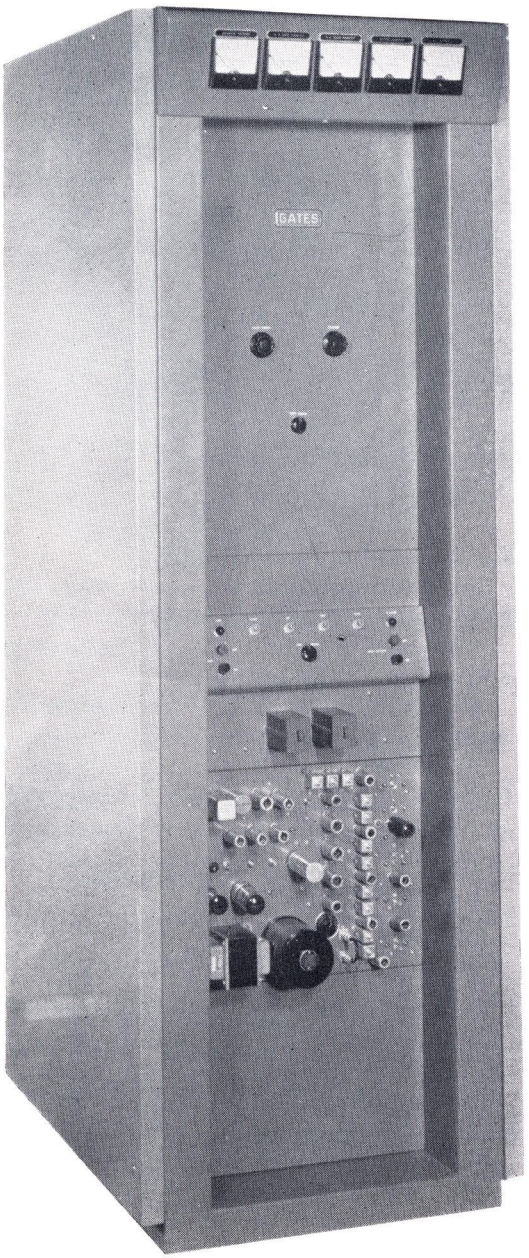


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GATES

250 WATT FM TRANSMITTER

(Model FM-250B)



- **100% new FM design.**
- **For 88-108 Mc broadcasting and other models between 40 and 220 Mc.**
- **Multiplexing optional.**
- **Built for easy adapting to remote control.**
- **New wide response and low distortion.**
- **New exciter uses standard receiving type tubes.**

Scores of earlier Gates 250 watt FM transmitters have set the stage for this entirely new FM equipment. Constructed in one sturdy cabinet and entirely self-contained, the FM-250B eliminates the complexities formerly associated with FM and in the doing, adds greatly to performance standards and reliability.

The M-5534 exciter unit (block diagram on Page 65) with plug-in multiplex sub-channels as optional accessories is all new with basic design built around the additional quality demands in multiplexing which results in a superior exciter whether or not multiplexing is used. — If multiplex is added later, the cost is much less as the basic design is with multiplex in mind. See Page 70 for multiplexing.

The power output stage is single ended, using one 4X250B tube. As the exciter develops 10 watts output, the total 250 watt transmitter consists of the exciter and the single tube power amplifier stage.

Metering is complete including a direct reading power output and VSWR meter. Protective and operating relays are built with remote control in mind. No circuit breakers are employed. Ease of servicing is emphasized in the mechanical design. Air intake is filtered and air pressure to the power amplifier tube is diaphragm pressure switch protected. — The FM-250B is available for use at other frequencies and at other carrier swing limits between 40-88 and 108-220 Mc.

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GATES

FM-250B SPECIFICATIONS

POWER OUTPUT: Rated 250 watts.

FREQUENCY RANGE: FM-250B (Broadcast), 88-108 Mc.
FM-250C (Communications), 40-88 Mc and 108-220 Mc, as ordered.

FREQUENCY SWING: FM-250B, ±100 Kc (75 Kc considered 100% modulation).
FM-250C, available as ordered.

FREQUENCY STABILITY: 0.001% via temperature controlled crystal.

OSCILLATOR: Direct crystal controlled.

RF OUTPUT: 51½ ohms to coaxial line to Type N connector.

AUDIO INPUT: 600 ohms at +10 dbm, ±2 db (for 100% modulation).

FREQUENCY RESPONSE: Within 1.0 db of standard 75 microsecond pre-emphasis curve or flat ±1.0 db, 50-15,000 cycles, as desired. Specify if preference.

DISTORTION: (at 100% modulation)
1% or less 50-100 cycles.
0.5% or less 100-10,000 cycles.
1% or less 10,000-15,000 cycles.

NOISE: 65 db below 100% modulation (FM).
60 db below equivalent 100% AM modulation.

RF HARMONICS: Suppression meets or exceeds all FCC requirements.

POWER INPUT: 115 volts, 50/60 cycles, single phase, 2 KVA demand.

TUBES: (7) 6AU6, (4) 12AX7, (3) 6J6, (2) OA2, (2) 866A and one each 6360, 6AQ5, 6080, GZ34/5AR4, 4X250B.

METERING: Filament volts, PA grid current, PA plate current, plate volts, power output/VSWR. Pin jacks measure each circuit in exciter using standard volt-ohm-meter and prods.

RELAY PROTECTION: Grid underload, plate overload, air pressure, door interlock, filaments or end plate voltage on.

SIZE: 78" high, 27" wide, 36⅓" deep. If end bells removed, width reduces to 24".

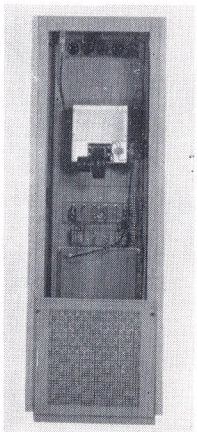
WEIGHT: Net 510 lbs. Packed 820 lbs. Cubage 44.

FINISH: Medium gloss gray with escutcheons in black and trim in chrome.

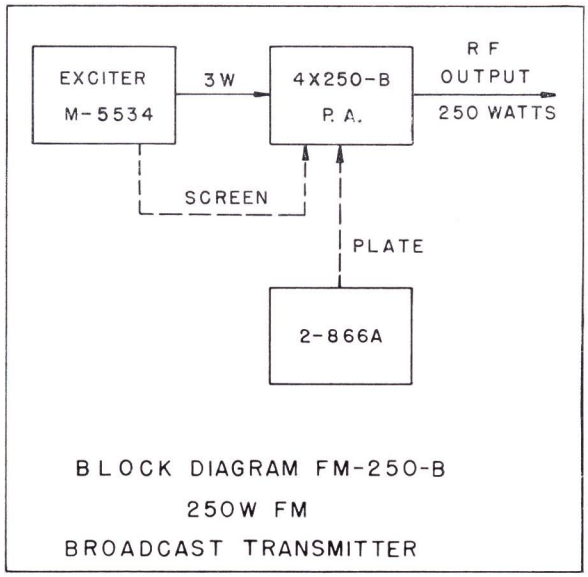
ORDERING INFORMATION

FM 250 watt broadcast transmitter with tubes, crystal and oven*	**FM-250B**
FM 250 watt transmitter for 40-88 Mc or 108-220 Mc, with tubes, crystal and oven**	**FM-250C**
Spare 100% tube complement for FM-250B	**TK-311**
Multiplex single sub-channel	**M-5633A**
Multiplex dual sub-channel	**M-5633**

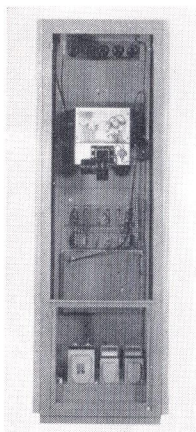
* State carrier frequency when ordering.
** State carrier frequency and frequency swing when ordering.



Rear of FM-250B and FM-250C transmitters showing air filter intake and internal units with dust covers in place.



BLOCK DIAGRAM FM-250-B
250W FM
BROADCAST TRANSMITTER



Open view of FM-250B and FM-250C exposing interior of power amplifier and power supply components.

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Then It Was Stolen From...
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GATES

1000 WATT FM BROADCAST TRANSMITTER

(88-108 Mc)

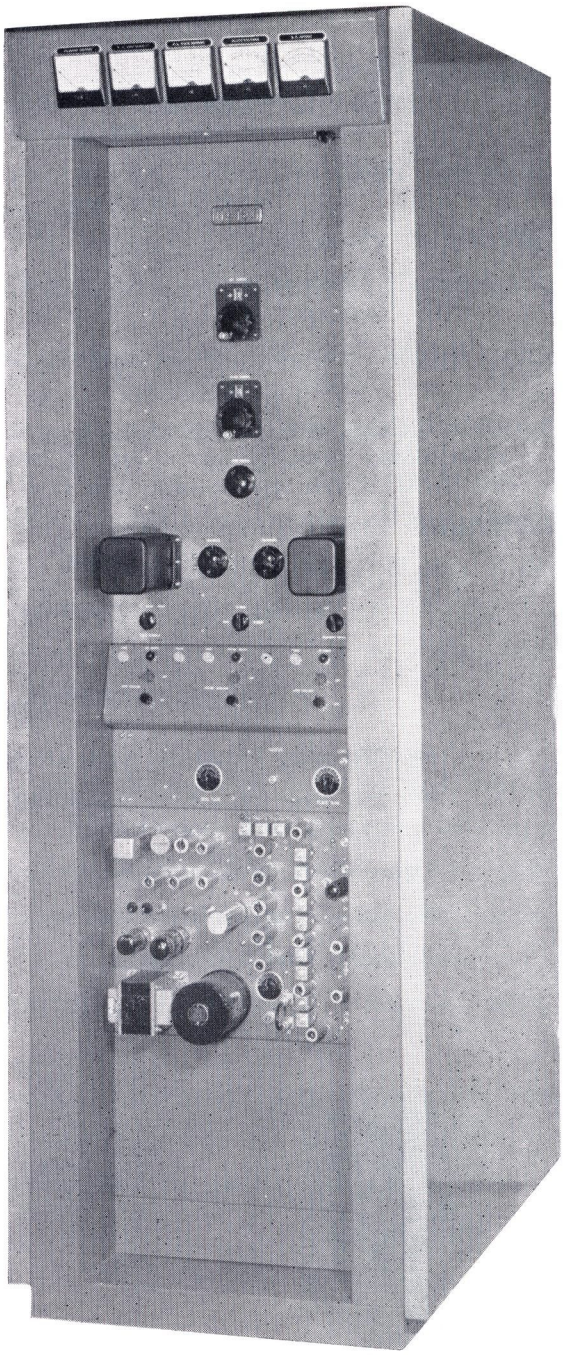
Another 100% new FM broadcast transmitter fitting the exacting needs of the Hi-Fidelity era. New circuits and greatly simplified design up-grades FM to a new quality stature. Inbuilt reliability, a new exciter using standard receiving tubes and elimination of clumsy mechanical arrangements, often associated with earlier FM equipments, assures complete technical contentment through minimum service and maintenance needs.

As in all Gates FM transmitters, multiplex is an optional accessory. Where basic design is with multiplex in mind, the main channel exciter must be way above normal needs in standard FM. This makes for better FM broadcasting and much lower cost multiplexing equipment. — The M-5534 exciter "block diagram" is found on Page 65. Multiplexing is discussed on Page 70.

Radio frequency line-up consists of the M-5534 exciter feeding a 30 watt IPA stage which in turn drives the push-pull 4-400A power amplifiers to produce an easy 1000 watts output. Coupling between exciter and IPA, and IPA and the power amplifier is at the low 51 ohm impedance. This greatly adds to stability and ease of tune-up.

The relay complement is complete including: (a) filament start contactor, (b) plate start contactor, (c) grid underload protection, (d) plate overload, (f) door interlock, and (g) diaphragm type air flow guard to the power tubes.

Exciter, IPA and power amplifier are each in separate shielded compartments to eliminate interaction and assure meeting FCC harmonic standards. The output meter reads directly "power in watts" and VSWR. Two power supplies, a 600 volt and 3500 volt, operate intermediate and power stages respectively. Air intake is filtered and blower cooling is applied to the entire power amplifier chamber.



Attractively styled, the FM-1B, 1000 watt FM transmitter has all controls to the front including exciter tubes and pin jacks for testing. If multiplex is added, the blank panel at the bottom is removed and multiplex quickly installed.

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GATES

FM-1B SPECIFICATIONS

POWER OUTPUT: Rated 1000 watts. Capable 1100 watts.

FREQUENCY RANGE: 88-108 Mc. (On special order, available for other frequencies between 40 and 88 Mc.

RF OUTPUT: 51½ ohms into a 7/8" coaxial flange connector.

OSCILLATOR: Direct crystal controlled.

FREQUENCY STABILITY: 0.001%.

HARMONICS: Suppression meets or exceeds FCC requirements.

MODULATION: ±100 Kc, (±75 Kc required for 100% modulation).

AUDIO INPUT: 600 ohms at ±10 dbm ±2 db.

RESPONSE: Within 1 db of standard 75 microsecond pre-emphasis curve or flat ±1.0 db from 50 to 15,000 cycles. If preference, please specify.

DISTORTION: (at 100% modulation)
1% or less 50-100 cycles.
0.5% or less 100-10,000 cycles.
1% or less 10,000-15,000 cycles.

NOISE: 65 db below 100% modulation (FM).
60 db below equivalent 100% AM modulation.

POWER INPUT: 230 volts, 50/60 cycles, single phase, 3-wire, 5 KVA demand.

TUBES: (7) 6AU6, (4) 12AX7, (3) 6J6, (2) OA2, (2) 6146, (2) 4-400A, (2) 8008 and one each, 6360, 6AQ5, 6080, GZ34/5AR4 and 5R4GYA.

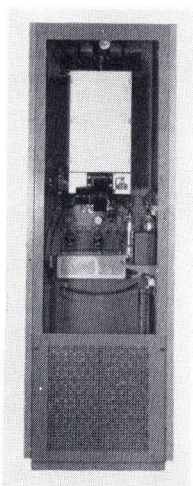
METERING: Filament volts, PA grid current, PA plate current, plate volts and power output/VSWR. (Pin jacks permit detailed checking of exciter with volt-ohm-meter and standard prods.)

SIZE: 27" wide, 78" high, 36½" deep. Width may be reduced to 24" by removing end bells.

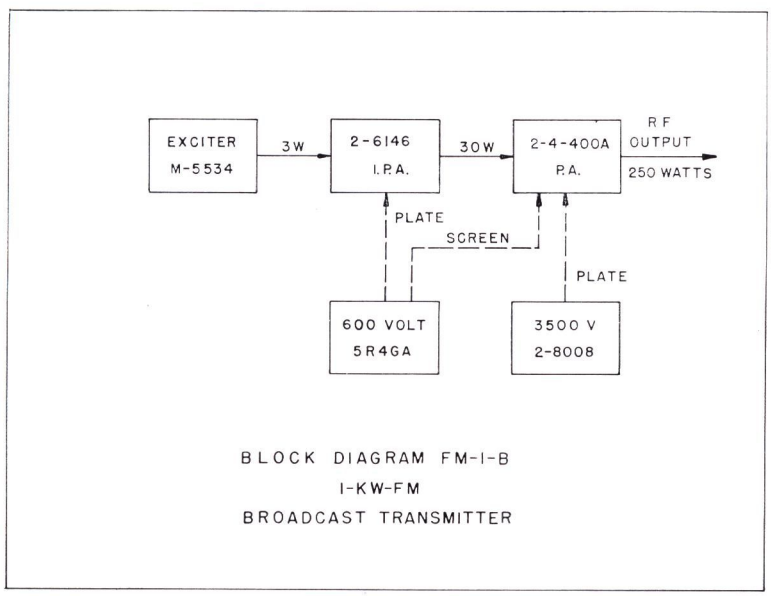
WEIGHT: Net 880 lbs. Packed 1140 lbs. Cubage 44.

ORDERING INFORMATION

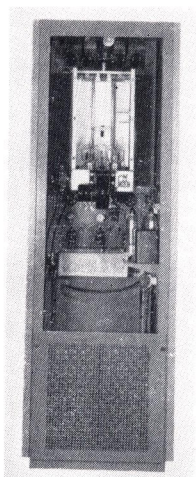
1000 watt FM transmitter with tubes, crystal and oven (state frequency when ordering)	**FM-1B**
100% spare tube kit for above	**TK-312**
Multiplex single sub-channel	**M-5633A**
Multiplex dual sub-channel	**M-5633**



Rear view FM-1B transmitter showing air intake filter and clean, straightforward construction.



BLOCK DIAGRAM FM-1-B
1-KW-FM
BROADCAST TRANSMITTER



The cover plate is removed to expose the push-pull power amplifier. Blower attaches directly to power tube chamber for maximum effect.

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GATES

MULTIPLEX FOR ALL GATES FM TRANSMITTERS

All Gates FM transmitters from the 10 watt and 50 watt models for educational institutions to the large 5000 watt models, are designed for the addition of multiplex now or at any future date.

The new Gates M-5633 and M-5633A multiplex sub-channel generators, for one or two sub-channels, are plugged into the main exciter unit with standard coaxial plugs provided. The addition of multiplex is simplified to bolting down the 10½" x 19" panel that accommodates the power supply, inserter and one or two sub-channels, plugging it into the main exciter, connecting to the power line voltage and with only touch-up tuning, it is ready to use.

The main exciter is of entirely new design to offer superb main channel service and equally important, to accommodate the broader technical demands of multiplexing, not possible with older FM exciters.

Multiplex receivers are available from several prominent companies. A sub-carrier frequency of 41 Kc for the first sub-channel and 67 Kc for the second sub-channel has been adopted by one well known receiver and functions excellently. Unless otherwise stated, these sub-frequencies will be supplied with Gates multiplex systems.

In all Gates FM transmitters except the BF-E-50B, multiplex can be installed in place of a blank panel on the front of the transmitter. In the BF-E-50B transmitter the multiplex chassis fits inside the cabinet.

Most multiplex installations are with one sub-channel. This permits regular broadcasts on the main channel and storecasting, music service to restaurants, etc., or any other approved service on the sub-channel. Many will recognize the stereophonic possibilities. In the communications models, the sub channel may be used as a talking channel or a second program channel, subject to restrictions of government bodies and technical feasibility.

M-5633A SUB-CHANNEL is a single sub-channel unit with inserter and power supply, ready to plug in the main exciter.

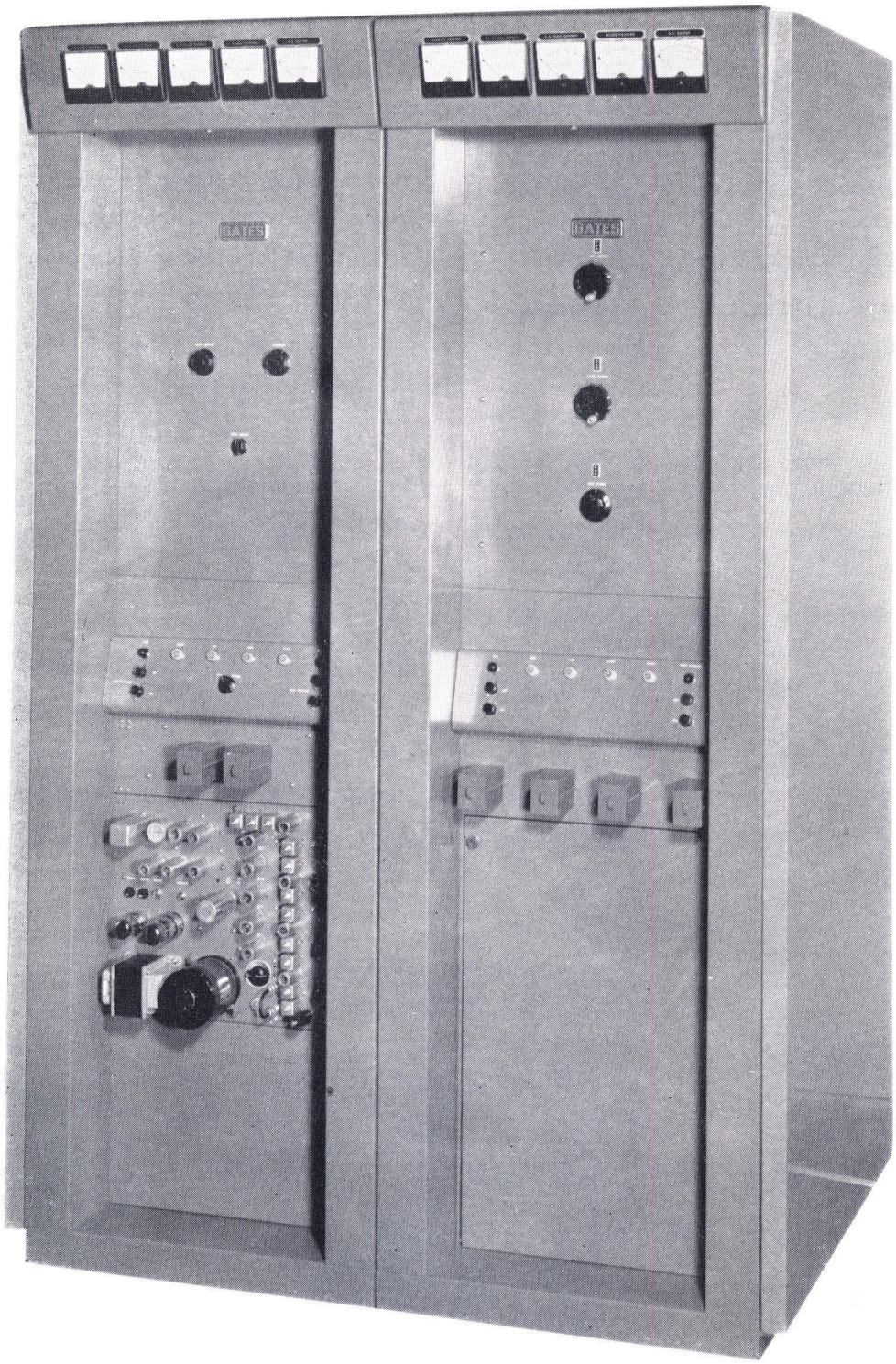
M-5633 DUAL SUB-CHANNEL is the same as the M-5633A but has the second sub-channel added.

GATES RADIO COMPANY
Quincy, Illinois, U. S. A.

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GATES

5000 WATT FM BROADCAST TRANSMITTER



A new quality 5 KW FM power plant with multiplex optional, to fit the most exacting technical requirements of an industry on the march. NEW, low cost, long life tube complement. NEW performance standards and NEW ease of servicing to keep a fine transmitter fine!

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GATES

FM-5B 5000 WATT FM TRANSMITTER

Rated at one-half percent distortion between 100 and 10,000 cycles and 1% at 50 cycles and 15,000 cycles, the new FM-5B power in FM will produce true Hi-Fi-Quality. An entirely new exciter (schematic Page 65) employing pulse techniques in phase modulation was created. The greater quality demands of multiplexing demanded research in circuit constants with the result, a simpler, better performing and highly reliable basic exciter void of special tubes and where standard tubes, when replaced, necessitates no readjustments for best performance.

The left cabinet of the FM-5B FM transmitter (Page 71) will be recognized as the FM-250B, 250 watt transmitter listed on Page 66. The 51 ohm output of this 250 watt model becomes the driver for the 5 KW amplifier. This adds stability and ease in servicing and with the 5000 watt section entirely independent as to power supplies, control circuits and function the possibility of interaction, the cause of instability, is eliminated. For full detail on the FM-250B transmitter, the driver for this 5KW model, the reader need only refer to Page 67.

For 5 KW, two 6076 tetrodes are operated in push-pull and receive their plate voltage from a self-contained, 3-phase, full wave power supply delivering 5000 volts to the plate. An intermediate screen supply consists of dual 8008 tubes as a full wave supply.

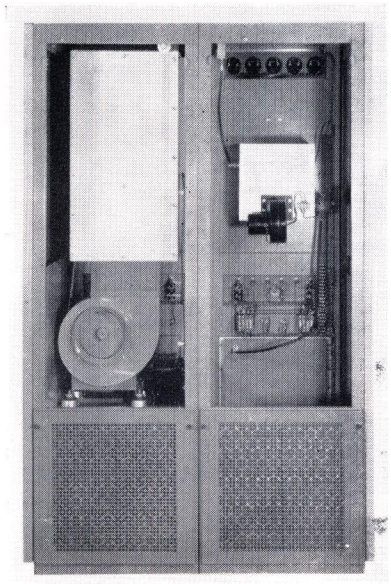
As the carrier frequency appears at the output of the RF exciter, both the IPA driver, the IPA itself and the power amplifier operate at the assigned carrier frequency. This again adds to stability as well as assured ease in modulation.

Protective circuits are all relay controlled for both instant protection and easy adaptation to remote control. RF output metering reads directly in watts and standing wave ratio. Multiplex may be added at any time or ordered with the equipment. Please refer to Page 70 for multiplexing.

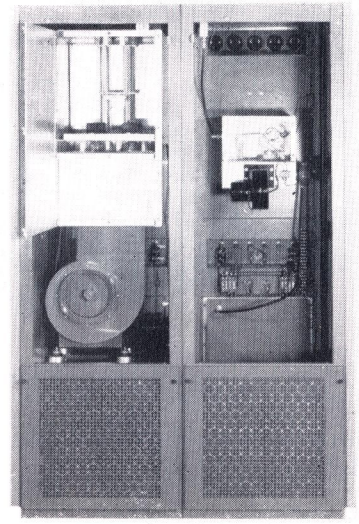
In the Gates FM-5B, 5000 watt FM transmitter, the buyer has indeed the very latest and most modern FM broadcasting equipment available today. Nothing has been spared to make it so. Here indeed is the excellence of Gates research demonstrated at its fullest fruition.

●

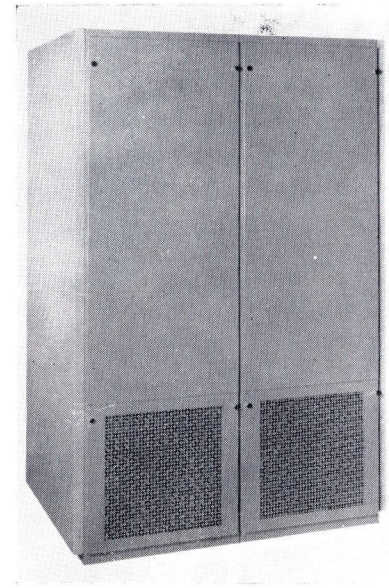
Rear of FM-5B, 5000 watt FM transmitter. The right cabinet is the FM-250B transmitter described on Page 66.



Open view of the 5 KW power chamber. The chamber door hinges open for quick accessibility. The large squirrel cage blower supplies an over abundance of air for long tube life.



Full length rear doors are fully removable, permitting location of the transmitter closer to the rear wall. The air intake filters are shown at the bottom.



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GATES

FM-5B SPECIFICATIONS

POWER OUTPUT: Rated 5000 watts. Capable 5500 watts.

FREQUENCY RANGE: 88-108 Mc. (Other frequencies to 170 Mc available on special order.)

RADIO FREQUENCY OUTPUT: 51½ ohms into 1⅝" coaxial flange connector.

OUTPUT METER: Reads directly in watts power plus standing wave ratio.

OSCILLATOR: Direct crystal control.

FREQUENCY STABILITY: 0.001%.

MODULATION: Phase shift with pulse techniques.

MODULATION CAPABILITY: ±100 Kc, (±75 Kc=100% modulation).

AUDIO INPUT: 600 ohms at +10 dbm ±2 dbm.

FREQUENCY RESPONSE: Within 1 db of standard 75 microsecond pre-emphasis curve or flat ±1 db from 50-15,000 cycles. If preference, please specify.

DISTORTION: (at 100% modulation)
1% or less 50-100 cycles.
½% or less 100-10,000 cycles.
1% or less 10,000-15,000 cycles.

NOISE: 65 db below 100% modulation (FM).
60 db below 100% equivalent AM modulation.

TUBES: (7) 6AU6, (6) 575A, (4) 12AX7, (3) 6J6, (2) OA2, (2) 6076, (2) 8008 and one each, 6360, 6AQ5, 6080, GZ34/5AR4, 4X250B.
Total tubes: 31.
Total tube types: 12.

POWER: 230 volts, 50/60 cycles, 3 phase, 20 KVA demand. 115 volts, 50/60 cycles, single phase, 500 watts.

METERING: (driver cabinet) (1) filament volts, (2) IPA grid*, (3) PA plate current*, (4) plate volts, (5) output meter in watts and VSWR.

(power amplifier cabinet) (1) filament volts, (2) PA grid, (3) PA plate current, (4) plate volts, (5) output meter in watts and VSWR.

NOTE 1: Pin jacks measure exciter tubes at every monitor point by using standard volt-ohm-meter and test prods.

NOTE 2: Use of power output/VSWR meter at output of driver amplifier or input of power amplifier, provides superb method of correct coupling and easy tune-up between driver (IPA) and final (PA).

* IPA in driver is actually PA of the 250 watt unit but of course becomes IPA in 5 KW model.

MULTIPLEX: (optional accessory) Attaches to lower front of left cabinet, (see Page 71 for illustration).

SIZE: (overall) width 51", height 78", depth 36½".
(each cubicle) width 24"**, height 78", depth 36½".

FINISH: Medium gloss gray with escutcheons in black and hardware chrome.

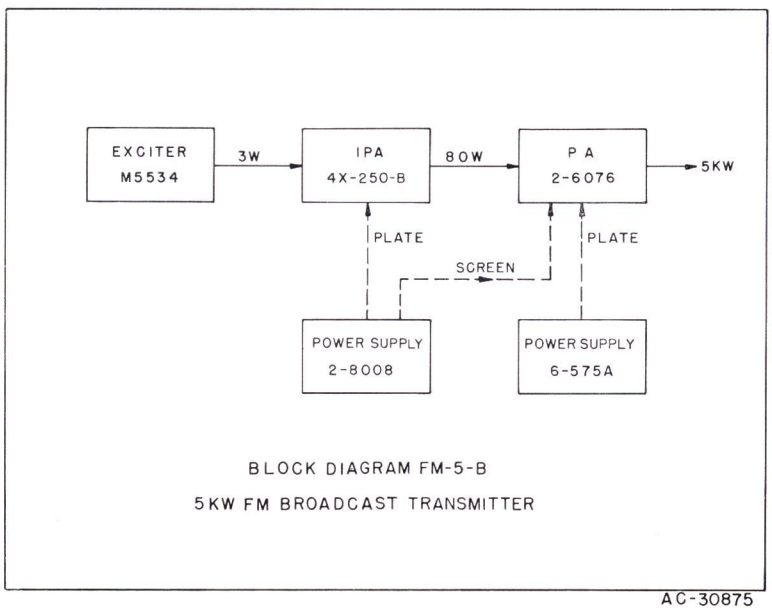
WEIGHT: Net 1800 lbs. Packed 2375 lbs. Cubage 78.

** Less removable end bells which add 1½" width to each end and included in overall width.

ORDERING INFORMATION

5000 watt FM transmitter with tubes, crystal and oven	**FM-5B**
100% spare tube kit for above	**TK-313**
Multiplex single sub-channel	**M-5633A**
Multiplex dual sub-channel	**M-5633**

NOTE A: See Page 70 for multiplex detail.
NOTE B: Please state frequency when ordering.



BLOCK DIAGRAM FM-5-B
5KW FM BROADCAST TRANSMITTER

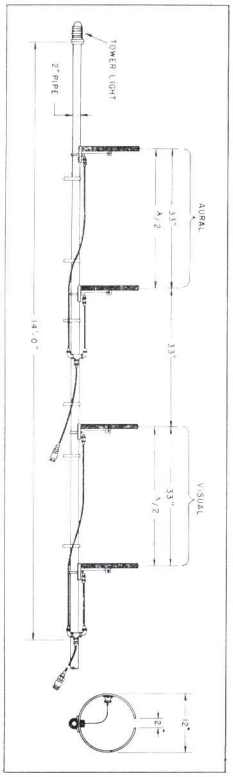
AC-30875

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GATES

ANTENNAS FOR TV AND FM

MODEL TV-100/TV-500

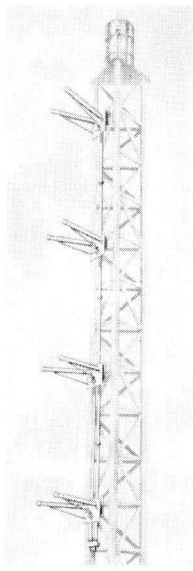


This antenna is designed specifically for low power TV. Consists of two sections of two rings each. One section is for visual and the other for aural. With this method, the diplexer is not required. As each ring has a power gain of 0.7, the two rings when stacked provide a power gain of 1.3. Thus, when used with normal transmission line lengths, unity power output is had, or a 100 watt transmitter will have an ERP of approximately 100 watts, or a 500 watt transmitter an ERP of approximately 500 watts.

Pattern is essentially omni-directional. Includes mounting mast with top plate for an obstruction light. Rings are provided with connecting coaxial cable and matching studs. Each antenna is tested prior to shipment. Impedance 51 ohms. Size of rings and spacing varies as to channel.

For 100 watts, channels 2-6 ..... TV-100-L
For 100 watts, channels 7-13 ..... TV-100-H
For 500 watts, channels 2-6 ..... TV-500-L
For 500 watts, channels 7-13 ..... TV-500-H

MULTI-V ANTENNAS



Omni-directional, this popular Andrew antenna for FM in the 88-108 Mc band is available in a 2-bay, 4-bay, or 8-bay version. Power gain of 2 bay is 1.6, 3.7 for the 4 bay, and 7.3 for the 8 bay. Mounts on side of tower and light weight allows use on nearly any type of tower. Power rating up to 10 kw. Standard design is for use with 1 5/8" coaxial cable. However, smaller cables may be used by purchasing a simple reducer. The Multi-V line has been field proven by many years of dependable service at hundreds of radio stations in the country.

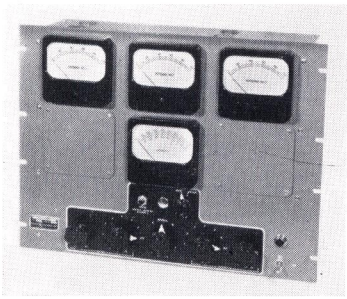
2-bay, power gain 1.6 .... Type 1302
4-bay, power gain 3.7 .... Type 1304
8-bay, power gain 7.3 .... Type 1308
Reducer to RG17U coax .. Model 4874



BROAD BAND FM ANTENNA

An omni-directional antenna for the 88-108 mc FM band, having a power gain of 0.8. Primarily designed for FM educational band but may be used at powers up to 1 kw. Design is broad band, greatly reducing standing wave problems due to changing climatic conditions. State frequency when ordering.

Two ring antenna, power gain of 1.3 ..... Type FM-22
Broad band antenna ..... Type FM-11



108E Three-Tower Monitor

PHASE MONITOR

Recognized as the finest phase meter built today. Available in standard models up to 4 towers. Special designs above 4 towers readily available. The Clarke 108 phase meter comes with remote antenna current meters and is unaffected by modulation. Operation has been simplified. Two selector switches are set to elements to be compared and the outputs of the amplifiers are adjusted to a red line on the meters. By a flip of a switch, the phase difference is indicated.

SPECIFICATIONS

FREQUENCY RANGE: 100 Kc to 2000 Kc (as ordered).
PHASE ANGLE RANGE: 0-360 degrees.
MONITORING ACCURACY: 1 degree.
RESOLUTION: ½ degree.
RF INPUT IMPEDANCE: 50 or 70 ohms (as ordered).
RF VOLTAGE RANGE: 1-7 volts.
SIZE: 14" high, 19" wide, 7" deep.
POWER: 115 volts, 50/60 cycles, 80 watts.
TUBES: (2) 6AU6, (2) OB3, (3) 6AL5, (1) 5Y3.

ORDERING DATA

Two Towers ..... Model 108D
Three Towers ..... Model 108E
Four Towers ..... Model 108F
Model 108 (more than four towers) ..... on request

When Ordering: State carrier frequency, remote meter ranges, type of sampling line or impedance and carrier power.



NOTE: As standard batteries are employed, it is recommended that batteries be procured locally as needed.

FIELD INTENSITY METER

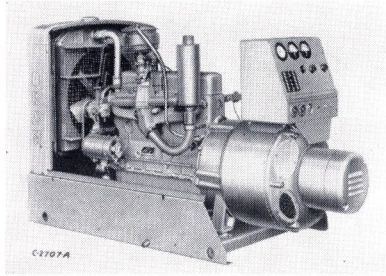
The Clarke 120D (formerly WX-2D) field meter is for measurement of radio signal intensity in the broadcast band between 540-1600 Kc. Sensitivity from 10 microvolts to 10 volts per meter, makes it equally effective for interference studies and close in measurements of high power directional arrays. — For measurements of any directional system or signal intensity, this test instrument is indispensable. — The 120D meter is battery operated, weighs only 12½ lbs. and is direct reading.

SPECIFICATIONS

FREQUENCY RANGE: 540-1600 Kc.
FIELD INTENSITY RANGE: 10 microvolts to 10 volts per meter.
ACCURACY OF ATTENUATORS: 2%.
OUTPUT INDICATORS: Panel meter, direct reading, with logarithmic scale graduated 1 to 10 and HAVING NO ZERO MARK (needle is OFF SCALE when meter is not energized). Provision for using recorder, and headphones.
ANTENNA: Shielded unbalanced loop.
BATTERIES: Five 1½ volt A. Two 67½ volt B.
BATTERY LIFE: Approximately 500 indications.
TUBES: (4) 1T4, (2) 1R5.
SIZE: 9" high, 13" wide, 5¾" deep (closed).
WEIGHT: 12½ lbs.

Field Meter, less batteries ..... Model 120D

ELECTRIC GENERATING PLANTS

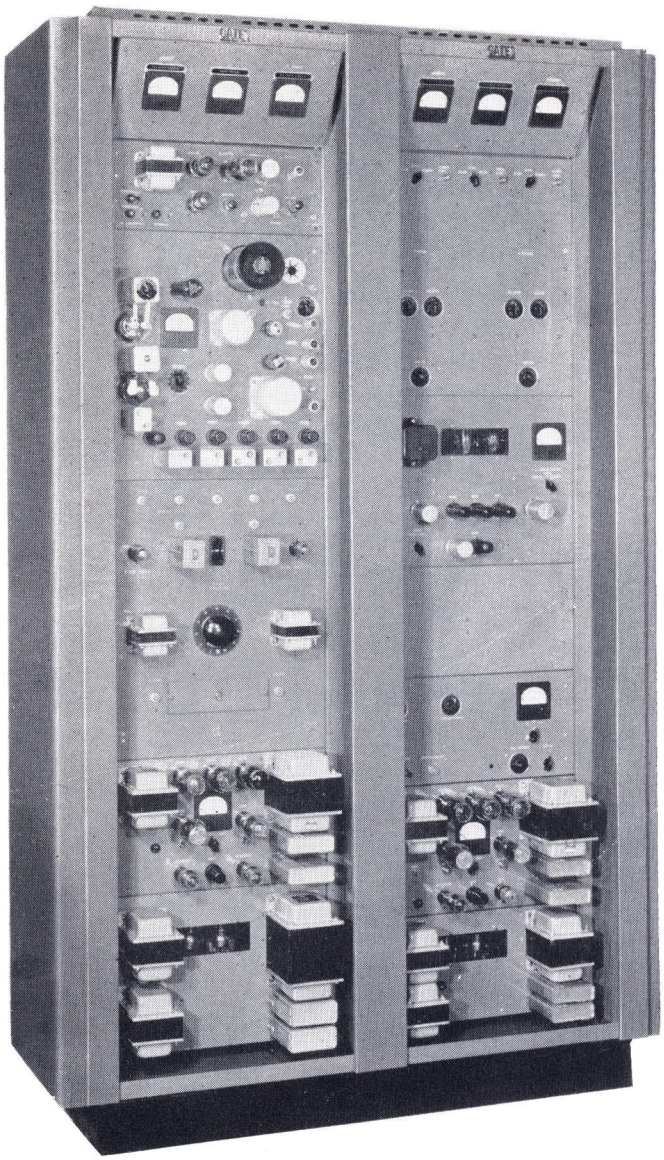


Electric and diesel generating plants are available in all powers from 1 KW to 500 KW. Pictured above is the popular Onan 25,000 generating plant. Ideal for use in providing complete power for radio and TV stations. Full information, prices, supplied upon receipt of customer's requirements.

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GATES

BT100A 100 WATT TV TRANSMITTER



Low power television or satellite operation is becoming more and more popular. For VHF channels 2-13, the BT100A excellently fills this need in providing both picture sharpness and aural quality second to none. The BT100A transmitter is built in two standard rack cabinets. Use of vertical construction assures 100% access to all parts. — Top quality characteristics of Gates equipment is certainly amplified in the BT100A transmitter by fine workmanship and the use of the best components money can buy. A 50 watt model, identical to the BT100A in appearance, is also available with 50 watt video and 30 watt aural output.

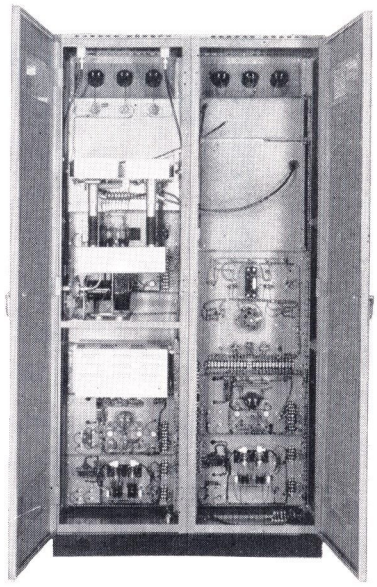
The Gates BT100A television transmitter is a complete aural-visual equipment ready to attach to aural and video input and antenna. Though the maximum power rating is 100/60 watts for visual-aural, the BT100A may be operated at lower powers, also. Ideal as a low power TV transmitter, it may also be employed as an exciter for higher powered transmitters and will find good acceptance for production line testing of TV receivers as well as laboratory use.

The aural section of the transmitter consists of an exciter modulator and a power amplifier. Referring to the block diagram on the next page, the oscillator is crystal controlled with the output coupled to the shaping and modulating circuits. Audio voltage is applied in such a manner to cause a phase shift in the oscillator frequency of the audio rate. The oscillator frequency is then multiplied through a series of multipliers to the operating frequency. The output of the exciter modulator is at operating frequency and is used to drive the power amplifier. Conventional circuitry is used throughout.

Visual section design consists of an RF exciter, video modulator, and power amplifier. The exciter multiplies the crystal oscillator frequency to the operating frequency and at the proper power level to drive the power amplifier. The modulator is a video amplifier that amplifies a standard video input voltage to the power required to modulate the power amplifier. The power amplifier is grid-bias modulated. A diode is used to restore the DC component at the grid of the modulating stage. The modulating stage is DC coupled to the grid of the power amplifier.

A direct reading power output and VSWR indicator is standard equipment. Also provided is a video demodulator wave form and modulation monitor, indicating modulation percentage and wave shape. The monitor output may be attached to a wave form or picture monitor.

Vertical construction is employed for ease in servicing. Cabinets are finished in hand rubbed gloss gray and provided with full length rear doors.



Rear BT-100A view. Left cabinet contains visual and aural power amplifiers, visual exciter, modulator and power supplies. Right cabinet, demodulator, aural exciter, control and protective panel and power supplies.

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GATES

BT100A SPECIFICATIONS

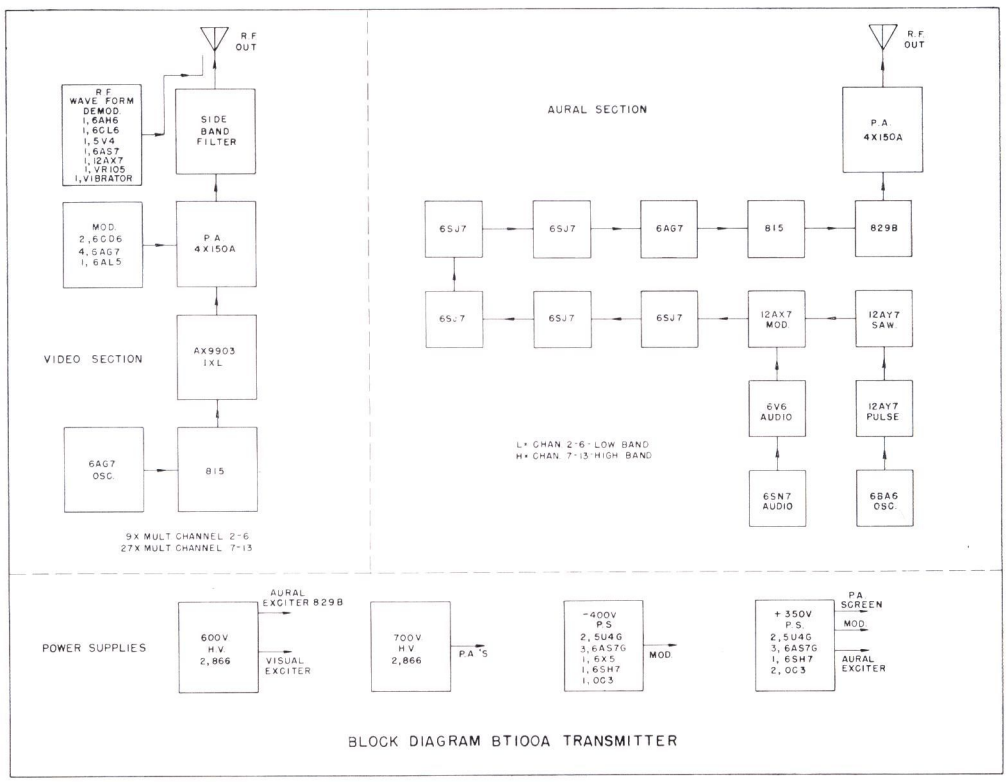
	Visual Section	Aural Section
TYPE OF EMMISSION:	A5	F3
FREQUENCY RANGE (channels):	2-13	2-13
POWER OUTPUT:	100 watts	60 watts
RF OUTPUT IMPEDANCE:	51 ohms	51 ohms
CARRIER STABILITY:	±1000 cycles	±4000 cycles
MODULATION CAPABILITY:	85 %	±40 Kc
METHOD OF MODULATION:	Amplitude grid modulation of PA stage.	Phase, employing pulse timing
FREQUENCY RESPONSE:	±2 db at 500 Kc ±2 db at 1.5 Mc ±2 db at 2 Mc ±2 db at 3 Mc ±3 db at 4 Mc	±1½ db 50 to 15,000 cycles
INPUT IMPEDANCE:	73 ohms	600 ohms
INPUT LEVEL:	1.4 VPP	+10 dbm
DISTORTION:	.....	1½ % or less 50 to 15,000 cycles
NOISE:	.....	FM: 55 db below 100 % mod. AM: 50 db below 100 % mod.

POWER INPUT: 117 volts, 50/60 cycles, 1700 watts
SIZE: 50" wide, 84" high, 21" deep.
OPERATION CYCLE: Continuous duty.
WEIGHT: 1400 lbs. approximate.
CUBAGE: 68 cu. ft.

TUBES: One each, 6X5, 6BA6, 6V6, 6SN7, 829B, AX9903, 6AL5, 6AH6, 6CL6, 5V4, VR105; two each, 6SH7, 12AY7, 12AX7, 815, 4X150A; three each, OC3, 6AG7, 6SJ7, 6CD6; four each, 866A, 5U4G; seven each, 6AS7/G.

ORDERING INFORMATION

Complete 100 watt TV transmitter for 100 watts video and 60 watts aural output, with one set of tubes, two crystals and ovens BT100A
100% spare tube complement TK-212
Spare crystal and oven for visual section JKO9
Spare crystal and oven for aural section JKO7E
Complete 50 watt transmitter for 50 watt video and 30 watt aural output, one set of tubes, two crystals and ovens, identical to the BT100A except reduced to 50 watts BT50

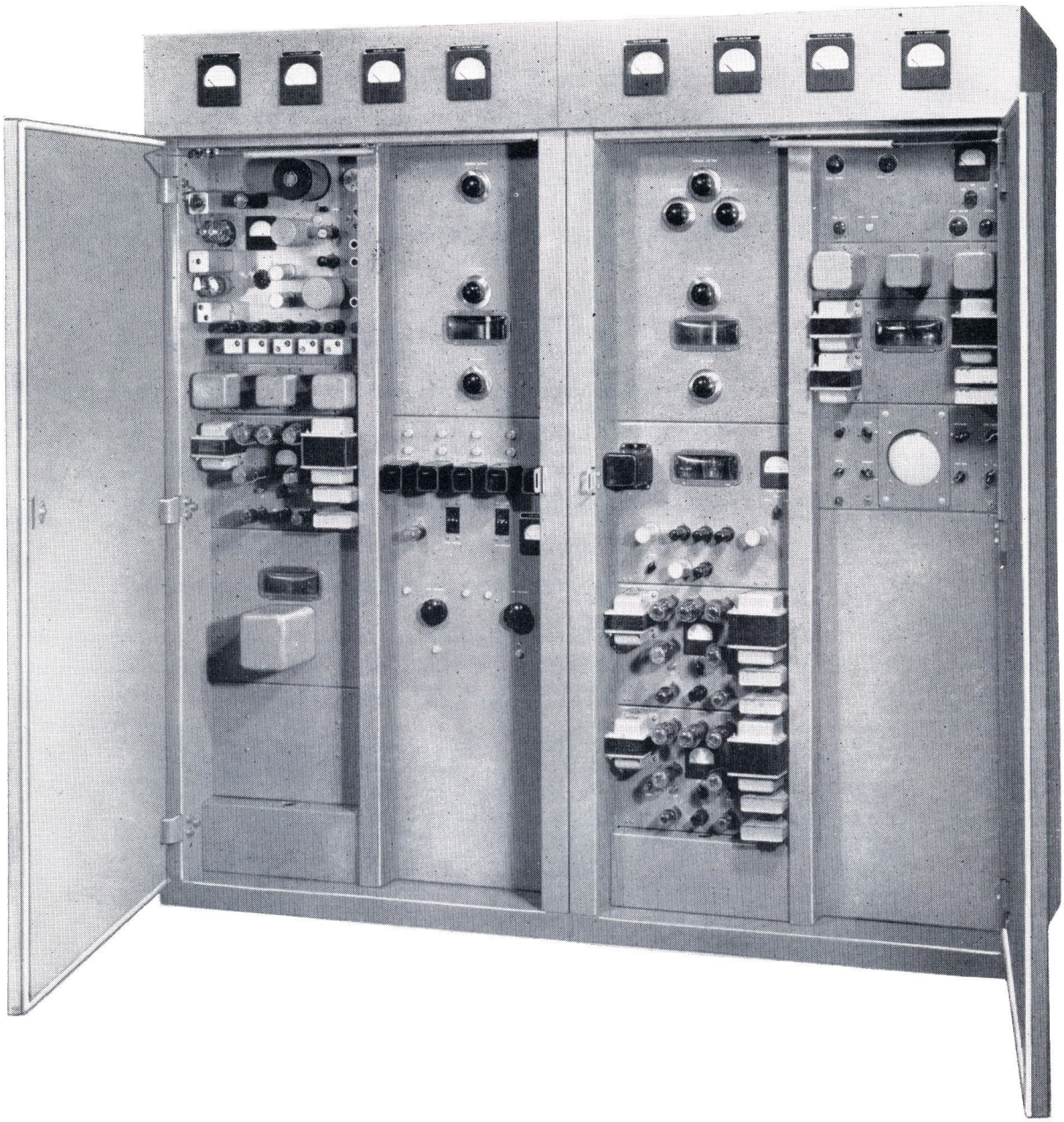


BLOCK DIAGRAM BT100A TRANSMITTER

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GATES

BT1A 500 WATT TELEVISION TRANSMITTER



For either the experienced engineer or the engineer tackling TV for the first time, the straightforward, easy to service and completeness of the Gates BT1A, 500 watt transmitter will be appreciated. — Often an accessory, but built into the BT1A is a wave form and modulation monitor. Variable powerstats in both AC and plate voltage supplies assures absolute correct operating voltages whether input voltage is higher or lower than normal. Added to fine performance is conservative design and the feature standard in all Gates designs—instant accessibility to all components.

(continued next page)

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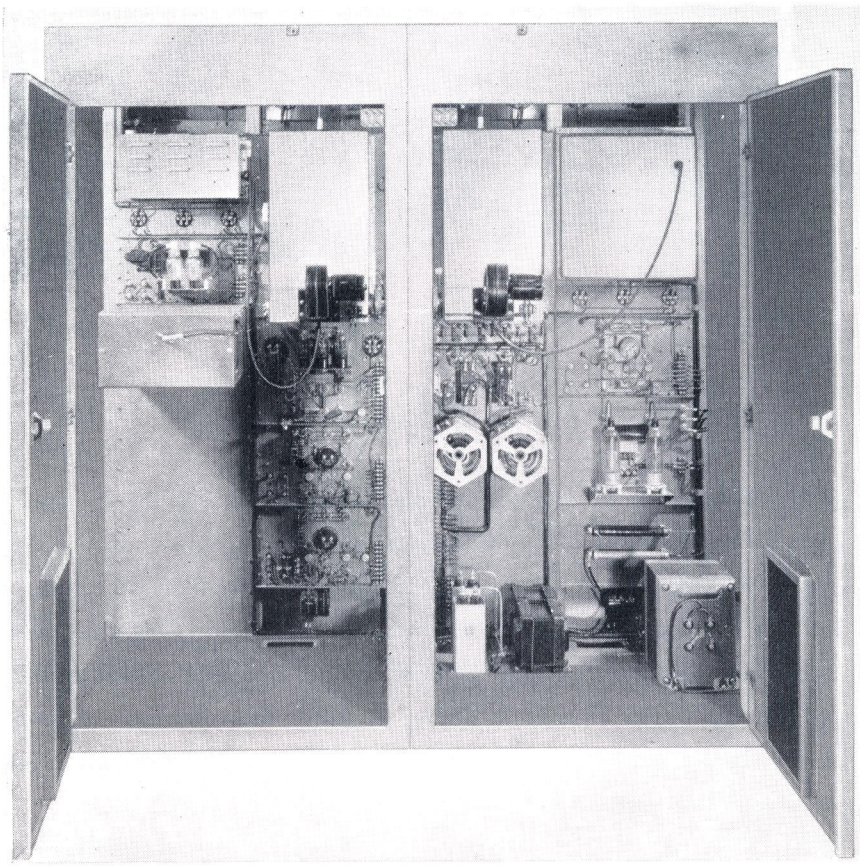
GATES

BT1A 500 WATT TV TRANSMITTER

A wealth of background in VHF and UHF transmitters has aided materially in BT1A design. Essentially two transmitters, visual and aural are in two separate cubicles that join together at time of installation. — Visual transmitter consists of only four radio frequency stages. This provides unusual operating simplicity. The visual modulator is also less complicated, having only three stages including modulator tube. — Aural transmitter is phase modulated at the crystal frequency and multiplied as much as 1296 times for the top channel 13.

Reflectometers to indicate both VSWR and power output are provided for both aural and visual units. Five power supplies, three of the regulated type, add to transmitter stability. A generous supervisory relay and circuit breaker complement assure full protection of the valuable tubes and components. — Fifteen meters indicate every desirable current and voltage, even including sections of the regulated power supplies, important in picture quality. — Full length front doors protect tuning adjustments even though dead-front design is followed.

Roomy interior assures cool operation and ease of maintenance. Incoming air is filtered. Double back doors allow walk-in-to-service.



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GATES

BT1A SPECIFICATIONS

FREQUENCY RANGE: Model BT1A-L, channels 2-6.
Model BT1A-H, channels 7-13.

RATED POWER OUTPUT: 500 watts visual, 250 watts aural.

RF OUTPUT: 51 ohms visual, 51 ohms aural.

RF STABILITY: Aural ±4 Kc. Visual ±1 Kc.

INPUT: Visual, 75 ohms at 1.4 volts peak to peak.
Aural, 600 ohms at +10 dbm ±2 db.

MODULATION CAPACITY: Aural, 100% equals ±25 Kc swing.
Visual, 90%.

AURAL RESPONSE: ±1½ db 50-15,000 cycles.

VISUAL RESPONSE: ±2 db at 0.5 Mc.
±2 db at 1.25 Mc.
±2 db at 2 Mc.
±2 db at 3 Mc.
±3 db at 4 Mc.

NOISE: Aural, −60 db FM or −50 db AM.
Visual, (amplitude variation over 1 frame) less than 5% of sync peak level.

TYPE OF MODULATION: Aural, phase shift.
Visual, grid amplitude.

BUILT-IN MONITOR: Wave form and modulation monitor is built-in for visual section. — Direct power output and VSWR indicators built-in for both visual and aural sections.

PRIMARY: 230 volt, 60 cycle, single phase at approximately 14½ amperes load.

SIZE: 89" wide, 35" deep, 78" high. Door swing, 35".

TUBES: Following tubes used in both BT1A-L and BT1A-H: (9) 6AS7, (6) 5U4G, (5) 6AG7, VR105, 6SJ7, (4) 12AY7, (3) 6SH7, 6CD6, (2) 866A, 8008, (1) 6V6, 6SN7, 12AX7, 6BA6, 6X5, 5BP1A, 1X2, 6X4.
—add to above for BT1A-L only: (4) 4-400A, (2) 815, 829B, (1) 6AG7.
—add to above for BT1A-H only: (4) 4X250B, (2) 5894, 5763, (1) 815, 829B.

METERING: Eight 4" meters and seven 3" meters reading: RV Power/VSWR Visual, RF Power/VSWR Aural, PA Grid Aural, PA Filament Aural, PA Plate Aural. PA Plate Visual, PA Filament, Plate Volts both Aural and Visual, PA Multi-Meter Aural Exciter, Screen Current PA Visual, Line Volts AC, 3 Multi-Meters for the 3 regulated power supplies.

POWER CONTROL: Variable front panel control powerstats allow full 0-maximum control of both primary line voltage and DC high voltage to power amplifiers.

SIDEBAND FILTER: Mounted external to cabinet.

SHIPPING WEIGHT: 3300 lbs. Cubage 71.

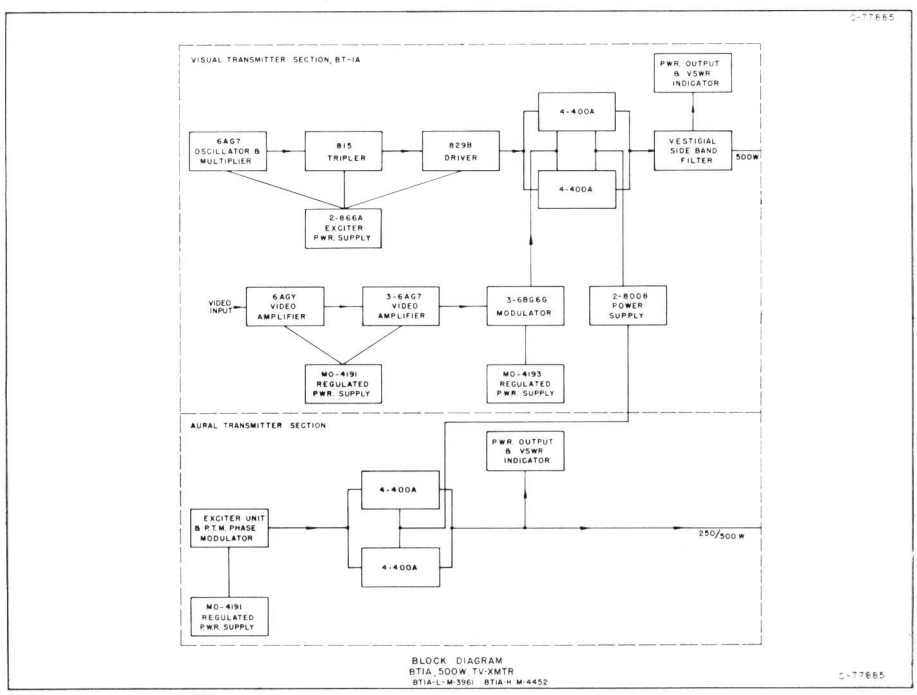
SUPPLIED AS STANDARD EQUIPMENT: Transmitter, instruction manual, one set of tubes, one JKO9 crystal and oven for visual, one JKO7E crystal and oven for aural, installation hardware and electrical jumpers.

OPTIONAL EQUIPMENT: Spare tube set, spare JKO9 crystal and oven, spare JKO7 crystal and oven.

ORDERING INFORMATION

Transmitter for channels 2-6 as outlined in "standard equipment" above	**BT1A-L**
Transmitter for channels 7-13 as outlined in "standard equipment" above	**BT1A-H**
Spare crystal and oven for visual	**JKO9**
Spare crystal and oven for aural	**JKO7E**
Spare 100% tube complement for BT1A-L	**TK-160**
Spare 100% tube complement for BT1A-H	**TK-258**

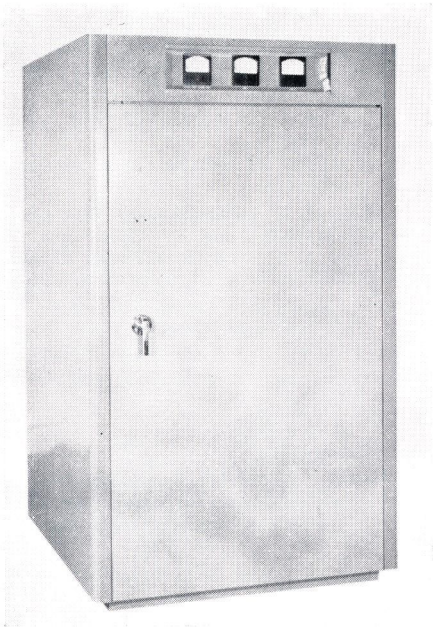
WHEN ORDERING: Be sure to state channel of operation. For other primary voltages, special primary voltage changing transformers are available.

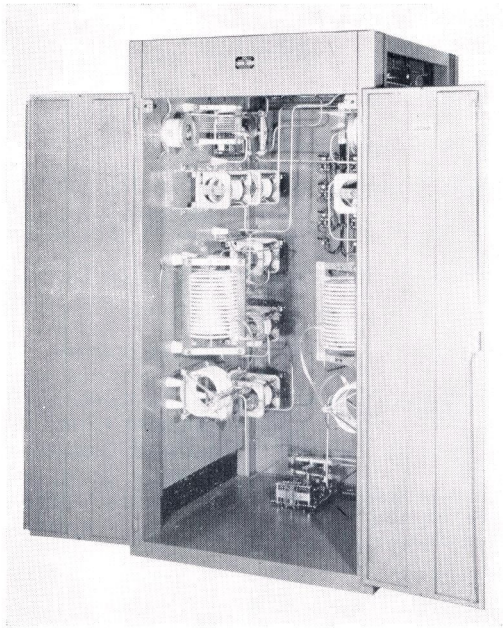


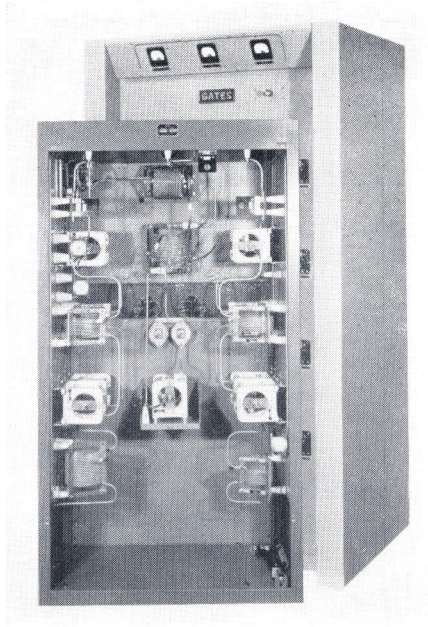
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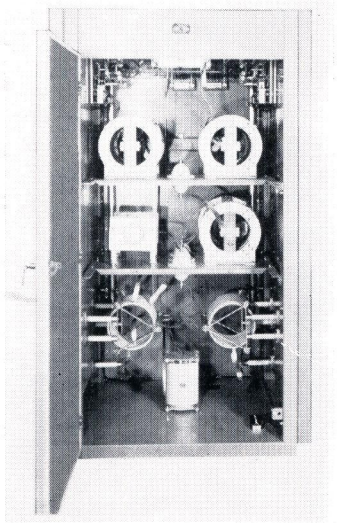
GATES

DIRECTIONAL PHASING EQUIPMENT







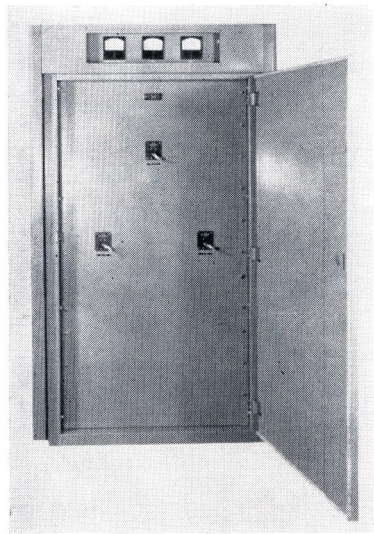


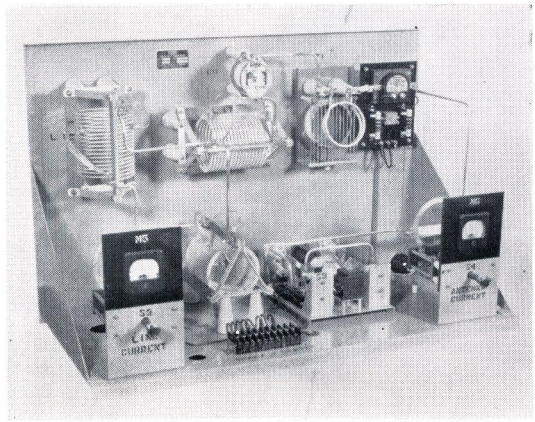
The total power of all Gates phasors manufactured in the past decade comes to well over half a million watts. This immense range of power signifies a combination of manufacturing experience and know-how that is unequaled in the broadcast industry.

Gates phasing equipment has for years been the choice of broadcasters and has held a fine reputation for meeting the exact specifications of consulting engineers. Stability of pattern and reliability of components, many of which are manufactured by Gates, are two reasons for the definite preference for Gates phasing equipment. Also, minimum tune-up time and minimum maintenance makes Gates phasors less expensive in the long run, though nothing is spared in the design cost. Gates manufactures directional phasing equipment up to 100 kilowatts in power and for any number of elements.

The directional phasing equipment illustrated on this page was manufactured to the specifications of the customer's consultant, and is typical of the hundreds of quality phasors designed and manufactured by Gates.

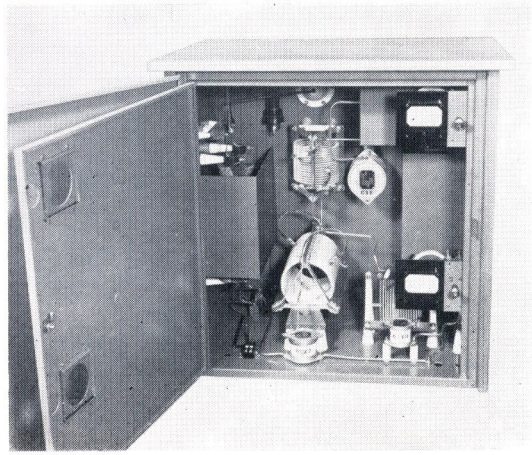
Prices noted in the accompanying price list are considered accurate estimates. Firm prices are quoted very promptly on receipt of your consulting engineer's specifications.





Indoor shelf-type antenna coupling units are often employed, mounted inside the so-called "doghouse" adjoining the antenna. There is no need for weatherproofing and all components are easily reached for adjustments.

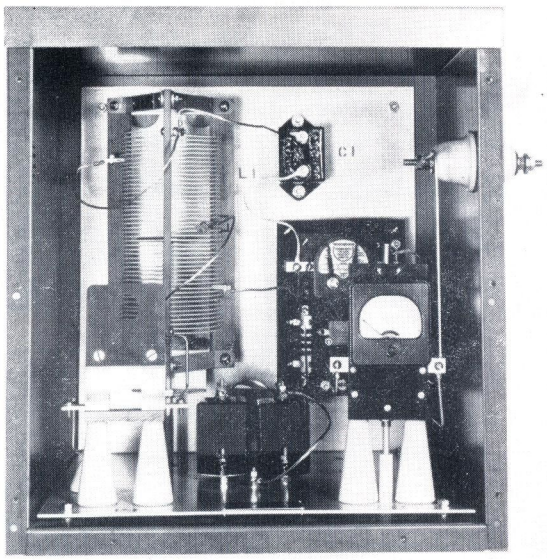
This weatherproof coupler does not require a doghouse and mounts adjacent to the tower either on posts or platform, and has double front door so that meters may be observed without opening inner door such as under storm conditions. Top of cabinet is sloped and this model is availabe in both ferrous and non-ferrous metals, depending upon engineering requirements.



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GATES

ANTENNA COUPLER — 1250 WATTS AND LOWER



A fully weatherproof coupler for series feed antennas to handle 1250 watts or less and at 100% modulation. Plug-in meter supplied, which may be inserted in either line or antenna circuit. Meter shorting switch is provided in antenna circuit to eliminate damage to meter during electrical disturbances. Antenna meter may be observed through glass porthole. Coil is silver plated, edgewise wound mycalex insulated, having generous inductance for arrangement in a full Tee network along with the fixed mica capacitors supplied. Extra room is provided in the cabinet for either diode or thermocouple type remote metering kits.

SPECIFICATIONS

CARRIER POWER: 1250 watts or less.

INPUT IMPEDANCE: 50 to 360 ohms, concentric or open line.

ANTENNA RESISTANCE: 10 to 1000 ohms.

ANTENNA REACTANCE: Plus J 600 to minus J 300 ohms from 540 to 1000 kc. Plus J 600 to minus J 500 ohms above 1000 Kc.

CIRCUIT: Tee network.

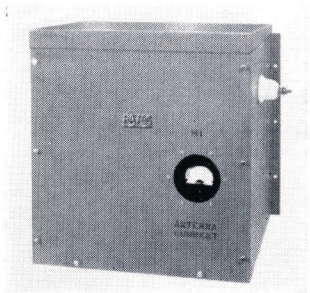
LIGHTNING PROTECTION: Meter shorting switch.

METERING: Plug-in 3" meter normally located as antenna meter but may be used as line meter for tune-up. Plug-in shorting bar provided for unused meter jack.

REMOTE METERING: Provision for either thermocouple or diode type as ordered.

SHIPPING WEIGHT: 98 lbs.

SIZE: 20" high, 20¼" wide, 18¾" deep.

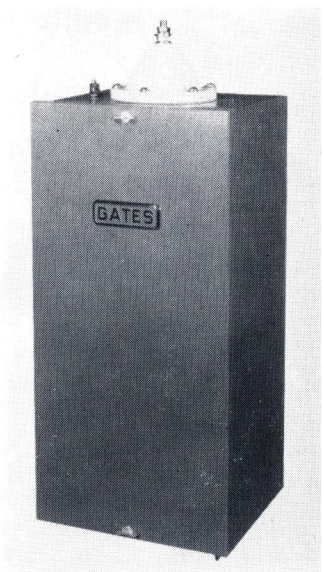


ORDERING INFORMATION

IMPORTANT: Kindly state transmission line impedance, frequency, tower height and tower measurements if known.

Antenna Coupler with antenna meter ..... Model 44

SERIES AND SHUNT FEED COUPLERS



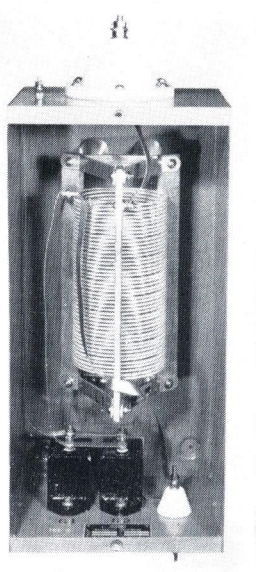
Model M-5178: Series feed, provides all coil and capacitance to provide full Tee network. Constructed in nonweatherproof steel cabinet, front removable. Size: 21" high, 10" wide, 9" deep. Matches RF input of 50 or 70 ohms. Output 10-600 ohms. In this model metering is external to the coupler, often desirable in unattended operation. For all powers 100% modulated up to 1250 watts carrier.

Antenna Coupler ..... Model M-5178

Model M-5179: Shunt feed coupler of coil and capacitor combination to tune out the reactance in shunt fed antenna coupling. Same size as M-5178 above. Rating up to 1250 watts carrier 100% modulated.

Antenna Coupler ..... Model M-5179

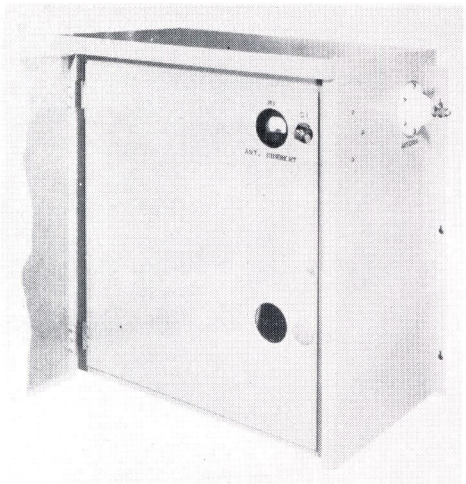
IMPORTANT: Please state frequency, tower height and tower measurements if known.

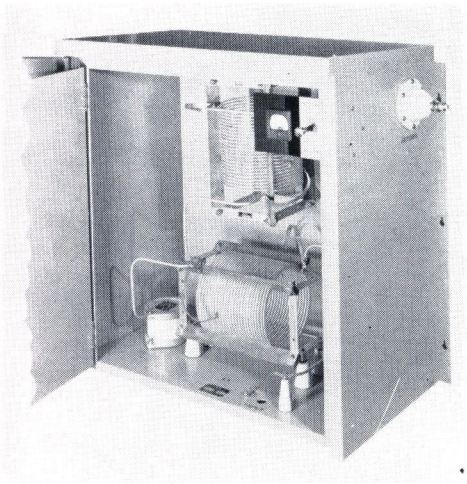


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GATES

5-10 KW ANTENNA COUPLING UNITS





These two nearly identical models differ only in component size for 5 and 10KW power ratings. Housed in an aluminum cabinet with double front doors. Size: 38" high, 37" wide, and 21½" deep. Antenna meter may be observed and meter shorting switch operated with the inner door closed. Coils are silver plated and micalex insulated. Capacitors have generous voltage and current safety factor. All ratings are 100% modulated.

Tuning unit may be mounted by metal flanges at each back side. Usually two wooden poles, set in the ground, are used for mounting. A large lead in bowl is provided for antenna connection. The use of non-ferrous metal in the tuning house will prevent component heating under certain conditions.

SPECIFICATIONS

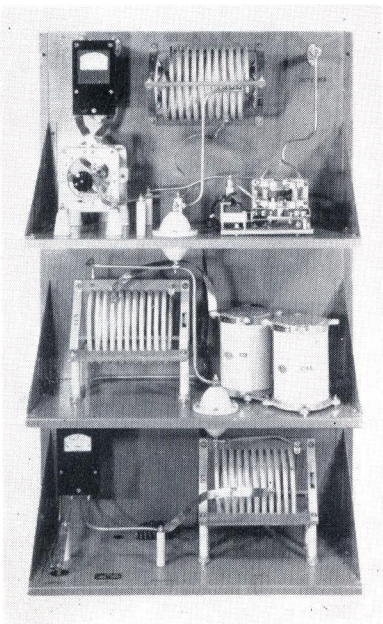
FREQUENCY RANGE: 540-1700 Kc, as ordered.
INPUT IMPEDANCE: 45-360 ohms, as ordered.
ANTENNA RESISTANCE: 20-1000 ohms.
REACTANCE: +J500 to –J500.
WEIGHT: Packed, 315 lbs. (export); 200 lbs. (domestic). Unpacked, 136 lbs. Cubage, 24.

ORDERING INFORMATION

IMPORTANT: When ordering, state carrier frequency, transmission line impedance, tower height and tower resistance measurements if known.

Coupling Unit for 5KW **M-5309A**

Coupling Unit for 10KW **M-5309B**



HIGH POWER ANTENNA COUPLERS

(50KW and 100KW)

Antenna couplers for powers in the 50,000 and 100,000 watt range are always of custom design but as the Gates inventory of components for these sizes is always substantial, the delay in custom design is held to the very minimum.

Illustrated is a typical shelf type unit employed in a North American 50,000 watt radio station. In this case, coil sizes were not excessive due to low current involved. Couplers are also available in weatherproof cabinets, where desired.

When ordering, please supply all available information such as (1) power (2) frequency, (3) tower height, (4) ground conductivity if known, (5) tower measurements if known, (6) transmission line impedance such as 50 ohms, 70 ohms, 250 ohms, etc., and whether coupler will be mounted in an out-building of if weatherproof type is desired.

Price of coupler can be quickly quoted with the above data supplied.

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GATES

TOWER CHOKES — ISOLATION COILS — SAMPLING LOOP

Solenoid Tower Chokes

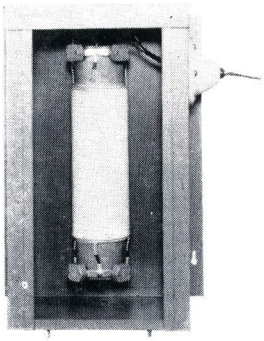


Fig. A

Most popular of all tower light isolation chokes. Available in 2 or 3 section and in open type, illustrated to right, or weatherproof type, illustrated to left. Wound on XX heavy bakelite tubing with mica by-pass condensers on each circuit end. Inductance 350 uh. 3" stand-off insulators are part of coil. Size: choke only, 18½" long, 5" diameter, 7½" from bottom of insulator to top of coil. Weatherproof type, 24" high, 17¾" wide, 10¼" deep. Illustration to left shows front cover of weatherproof unit removed for photographing.

M-3935A, 2-section, Fig. B — **M-3937A, 2-section, Fig. A**
M-3936A, 3-section, Fig. B — **M-3938A, 3-section, Fig. A**

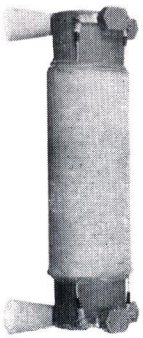
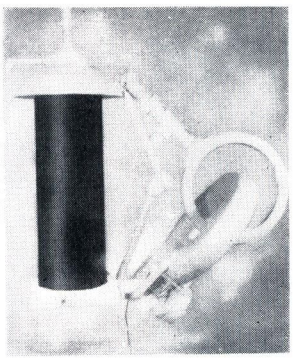


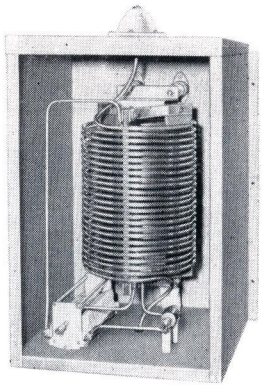
Fig. B

Austin Ring Type Tower Choke



Ring type tower choke is a transformer with clear air space between primary and secondary and resultant zero RF leakage. Independent of frequency. All models are for 115/230 volt primary and 115 volt secondary. Base insulator in photo for illustration purposes only.

Type	Capacity KVA	Mfg. Style	Net Wt. Lbs.	Attachments
A-2100	1—1.75	Side Bracket	81	none
A-2101	1—1.75	Side Bracket	85	Lt. gap
A-2102	1—1.75	Pedestal	82	none
A-2103	1—1.75	Pedestal	86	Lt. gap
A-1970	2—3	Side Bracket	188	none
A-1971	2—3	Side Bracket	201	Lt. gap
A-1972	2—3	Pedestal	182	none
A-1973	2—3	Pedestal	200	Lt. gap

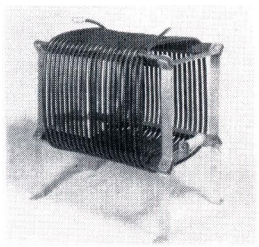


Isolation Coil

Used to isolate a phase sampling loop across base insulator of tower. Inductance 85 uh. Made of solid dielectric cable mounted on heavy bakelite bars. Available in weatherproof model illustrated above (front cover removed) or coil only for mounting inside tuning house. Size (weatherproof model): 20" wide, 32½" high, 18½" deep. State carrier frequency and power when ordering. Includes all necessary elements to match purchasers frequency.

Weatherproof isolation unit **M-3073**
Coil only, less cabinet **M-4561**
Weatherproof isolation unit with M-5573 coil (shown below) **M-5634**

M-5573 Isolation Coil



Used in the same manner as the M-3073 and M-4561 shown above. The coil is wound of RG-11/U solid dielectric cable with an inductance of approximately 100 uh. Where the consulting engineer wishes to resonate the coil, a separate capacitor is required.

Coil only **M-5573**

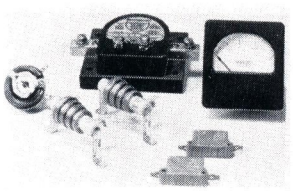


Fig. A

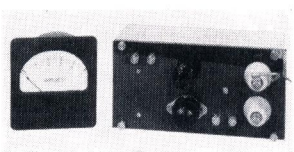


Fig. B

Remote Meter Kits

Thermocouple Type: Fig. A above. Includes 3" square case meter, thermocouple, adjusting rheostat, chokes and capacitors. May be used up to 1000 of 2C No. 18 or larger line for remote metering between tuning house and transmitter.

Complete (meter range 0-3 RFA) **M-3383**
Complete (meter range 0-5 RFA) **M-3133**
Complete (meter range 0-10 RFA) **M-3386**

Diode Type: Fig. B above. Inductively connects to antenna lead for excellent protection against electrical disturbances. Uses 6H6 tube. Operates from 115 volt tower light circuit. May be used with 2C line up to 5000 feet. Available with or without meter. Standard 1 MA meter is employed. Ratings are 100% modulated.

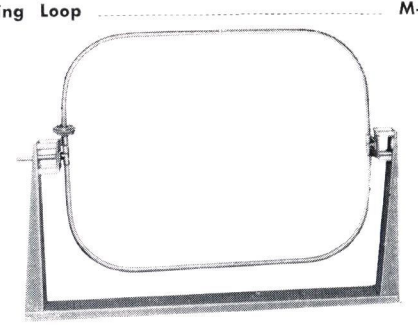
1KW or less, 0-3 RF scale **M-3294**
1KW or less, 0-5 RF scale **M-3294B**
1KW or less, 0-10 RF scale **M-3294D**
5/10KW, 0-5 RF scale **M-5334**
5/10KW, 0-10 RF scale **M-5335**
Diode less meter, 1KW or less **M-3759**
Diode less meter, 5/10KW **M-2765B**

Phase Sampling Loops

M-3283: This model especially applicable where high current ratios are to be sampled. May be rotated so that phase monitor amplitude values are nearly equal. Electrostatically shielded and insulated from tower. May be used with or without isolation coil at base of tower. Coil is single loop of 7/8" coaxial cable, heavily insulated from base frame. Matches either 50 or 70 ohm line. Size: 45" wide, 60" high.
Sampling Loop **M-3283**

M-3389: Very similar to M-3283 in size and rotating capabilities. Consists of a loop of RG/8U coaxial cable within a loop of 7/8" copper tubing. Provides unusually fine shielding and eliminates external coupling in preventing the flow of undesirable current in the outer conductor. Size: 63" high, 40" wide. For 50 ohm line only.
Sampling Loop **M-3389**

M-3723: A simple non-adjustable loop and not insulated from tower. Usually used in less complicated directionals where currents in towers are nearly equal and high enough to cover stray effects. Matches 50 or 70 ohms and must be used with isolation coil. Made of aluminum angle. Provided with connector for RG/8U line. Size: 60" high, 40" wide.
Sampling Loop **M-3723**



M-3283 and M-3389 Loops

Ordering Sampling Loops: Unless for replacement purposes, it is always suggested that sampling loops be ordered on recommendation of the customer's consulting engineer. As the loop and its associated transmission line, and in some instances the isolation coil, are all part of the overall computations, the slight delay in checking with the consultant will often save time and expense.

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GATES

NEW M-4990 BROADCAST FREQUENCY MONITOR

(Fully FCC Approved)



An entirely new AM frequency monitor offers the progressive broadcaster added accuracy, greater reliability, smaller size, plus many new features which result in a monitor that once installed performs with laboratory precision and minimum maintenance.

Again the stability of printed wiring adds to the demanded stability of a frequency monitor. Each wire in the same place is why each production model has prototype performance. The absence of parts stacking and the absoluteness of soldering in the printed wiring process continues the quality emphasis in an instrument that demands quality all the way.

A new vacuum type crystal unit, precise to broadcast transmitter standards without temperature control, is mounted with its oscillator stage components within a carefully designed temperature controlled chamber to result in ½ part per million frequency accuracy. The adjustable air gap crystal holder is history. — The **new** is precision on frequency as received.

The M-4990 frequency monitor is fully FCC approved, carrying approval No. 3-102.

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GATES

M-4990 FREQUENCY MONITOR

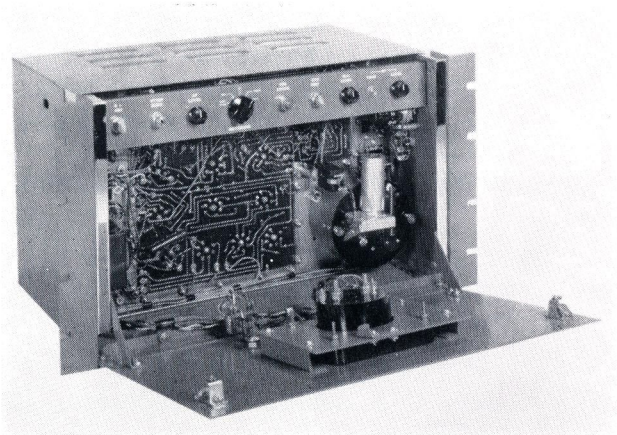
Basic circuitry is shown in the block diagram on the next page. A precision oscillator operates 1000 cycles below the carrier frequency. The output from this oscillator is isolated and amplified and then mixed in a detector stage with the radio frequency signal from the transmitter. This signal may be direct connected or when used in remote control (unattended) operation, the M-5549 whip antenna kit may be purchased for direct air monitoring over distances of 20 miles or more, depending on the transmitter power. The beat note from the detector is amplified and then applied to a discriminator. The output is rectified and applied to a DC meter calibrated in 1-cycle steps from −30 to +30 cycles.

The meter may be switched to several circuits including carrier level, frequency deviation, oscillator current and local/remote functions. — Outstanding feature is the accuracy over a wide range of input voltages and modest fading conditions, when used with the antenna, will not affect operational stability.

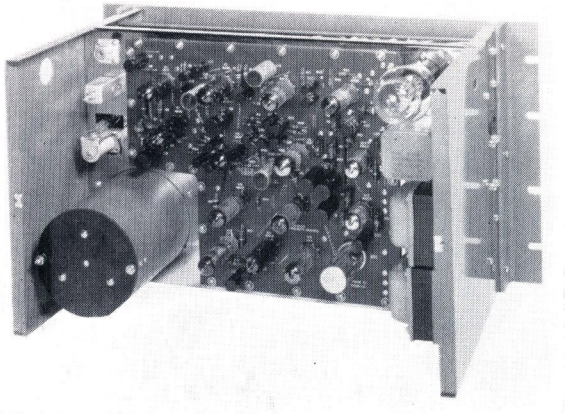
Servicing of the M-4990 frequency monitor has the excellence of all Gates products. Front panel hinge down brings all adjustments to the operator's finger tips. Both the filament and plate voltage supplies are fully regulated to add to accuracy under varying line voltage conditions. Connections are provided for a remote reading frequency meter which may be used with a line up to 2000 ohms resistance equivalent to 21 miles of telephone line.

Temperature control of the crystal chamber is through a mercury thermostat operating with a relay. The thermostat employs a heater winding to minimize temperature fluctuations during each heating cycle. The heater itself is the blanket type for absolute even distribution. If the rarity of failure of the heater control circuit would occur, a thermal fuse will meet and no damage to components will result to assure quick repairs.

In designing the Gates M-4990 frequency monitor, Gates engineers have applied exacting standards. They have incorporated the basic requisite of a broadcast frequency monitor, accurate frequency measurement. Hundreds of Gates frequency monitors are in use today. The M-4990 takes the desirable features of these earlier models and adds advancements in tube, circuit and crystal designs to provide the most advanced monitor manufactured today.

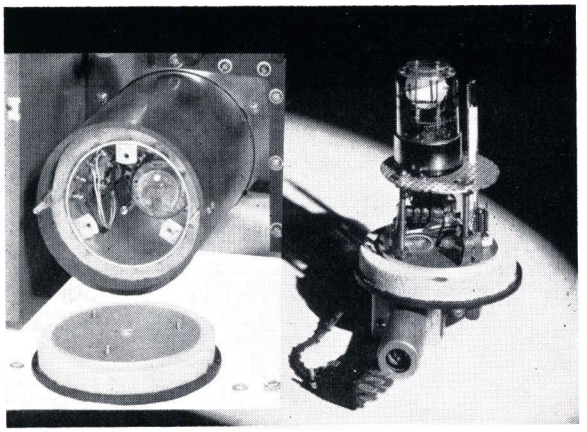


Front panel hinges down to expose operating adjustments and the plug-in crystal unit. Here is exhibited the uniformity of printed wiring to p.oduce uniformity in year-in and year-out service.



Rear of M-4990 frequency monitor with dust cover removed. Each resistor and capacitor is firmly secured to the printed wiring chassis. Parts stacking is obviously absent.

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Left, the crystal oscillator unit, heart of the M-4990 frequency monitor. The open view illustrates the vacuum crystal, under which are the oscillator components. The oscillator tube, however, is external to the temperature chamber. The entire unit is plug-in and there are no variable air gaps for frequency adjustment at time of installation.

SPECIFICATIONS

OSCILLATOR: Colprits electron coupled 1000 cycles below assigned frequency.

FREQUENCY RANGE: 540-1600 Kc as ordered.

DEVIATION RANGE: Meter reads −30/0/+30 cycles.

INPUT VOLTAGE: Supplied with external fixed pad to handle wide range of input voltages from 5 to 50 volts direct connected and down to 5 Mv with whip antenna.

INPUT SIGNAL: Modulated or unmodulated.

INPUT IMPEDANCE: 50/70 ohms.

OVERALL STABILITY: ±2 parts in one million.

OSCILLATOR STABILITY: ±0.5 parts in one million.

LINE VOLTAGE: 105-125 volts, 50/60 cycles at 85 watts.

TUBES: 12BY7A oscillator, 6AU6 oscillator amplifier, 6AU6 input amplifier, 6C4 mixer, 6AU6 audio amplifier, 6AU6 limiter, 6AQ5 cathode follower, 12AT7 AVC, 6AL5 discriminator rectifier, 6AL5 VTVM rectifier, 6X4 high voltage rectifier, 6AQ5's Series regulators, 6AU6 voltage amplifier, OB2 voltage reference, 13-4 Ballast.

SIZE: 19" wide, 10½" high, 10⅝" deep.

FINISH: Medium gloss gray.

WEIGHT: 32 lbs. net. 53 lbs. packed. Cubage 4.

FCC APPROVAL: No. 3-102.

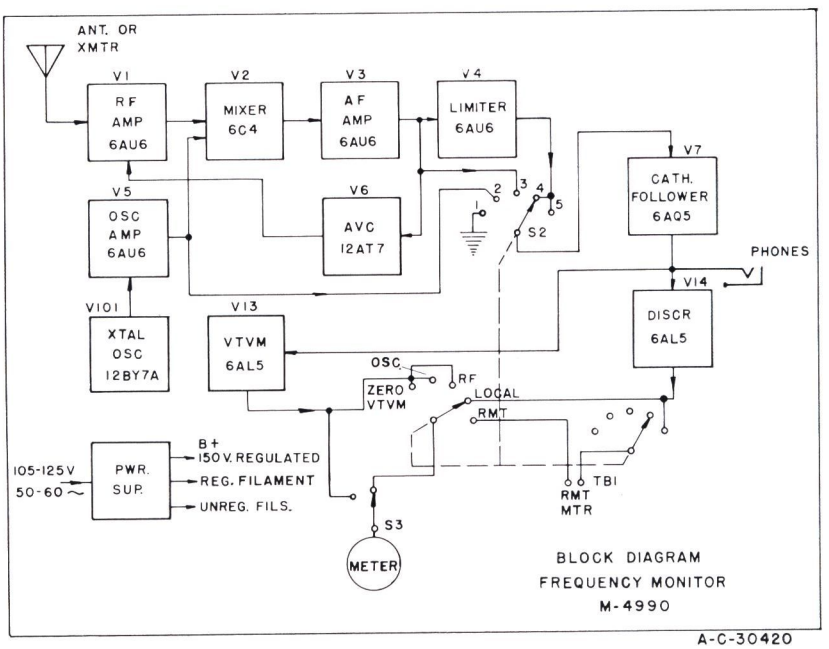
ORDERING INFORMATION

Frequency monitor with tubes and crystal, state frequency when ordering M-4990

100% spare tube complement TK-281

Remote frequency meter, reading −30 to +30 cycles, mounted on 5¼"x19" rack panel finished in gray M-5631

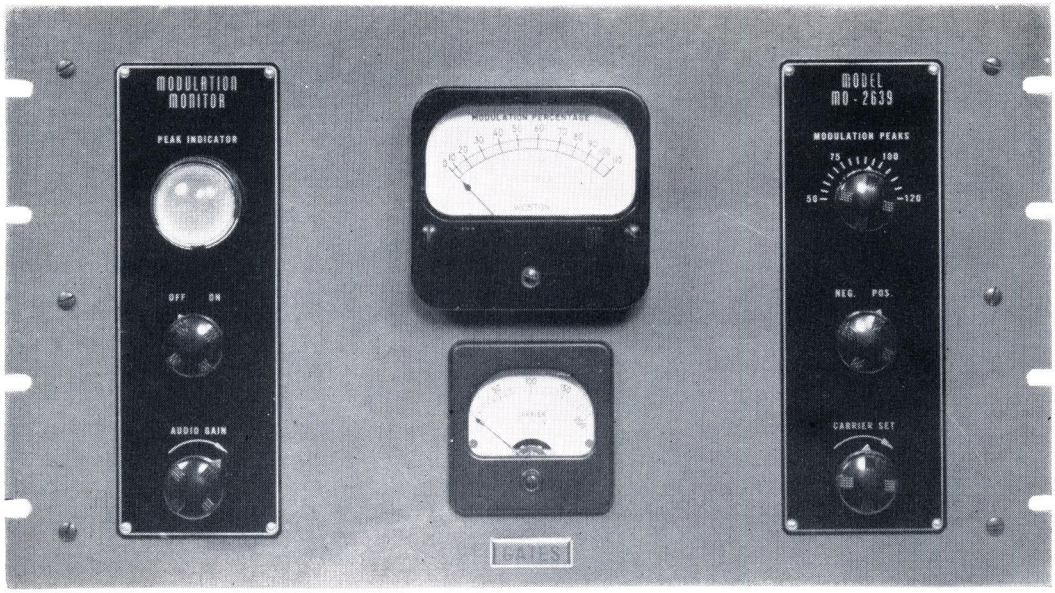
Whip antenna with coupler to match RG/59U cable and monitor M-5549



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GATES

BROADCAST MODULATION MONITOR



A fully FCC approved modulation monitor meeting all modern broadcast requirements, with a model available for both standard and high frequency service. Exclusive is the self-contained high level amplifier with sufficient power output to operate a loudspeaker for direct off-the-air monitoring.

The 4-inch modulation percentage meter is calibrated from —15 db to 0 db and 0-110% modulation. A neon lamp located behind a large bull's-eye on the front panel is adjustable to flash at any desired percentage of modulation. The 3-inch carrier meter allows direct center scale reading for proper RF input. Panel controls include:

(a) Carrier set adjustment.
(b) Positive-negative peak control.
(c) Peak indicator adjustment.
(d) Audio amplifier gain control.
(e) Off-On switch.

Each monitor is carefully manufactured and tested in accordance with specifications set forth under FCC standards and carries FCC approval No. 1556.

SPECIFICATIONS

FREQUENCY RANGE: MO-2639, 200-2000 Kc.
MO-2639A, 2-33 Mc.

RF INPUT: High impedance requiring less than ½ watt excitation.

LOUDSPEAKER IMPEDANCE: 4 to 8 ohms.

MODULATION PERCENTAGE RANGE: 0-110%.

CARRIER LEVEL METER RANGE: 0-200%.

DECIBEL SCALE RANGE: Calibrated to 15 db below 100% modulation.

AUDIO AMPLIFIER: Range exceeds best quality speaker capabilities.

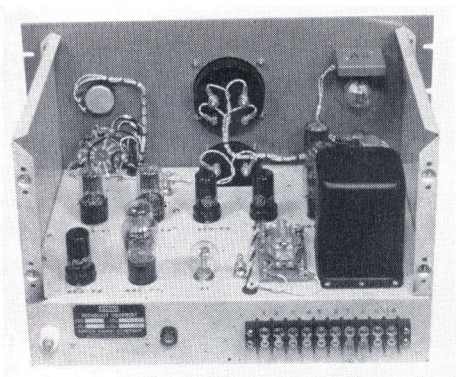
POWER: 115 volts, 50/60 cycles at 65 VA.

TUBES: 3 each 6X5, 6C5; 1 each 6F6, 885, VR-150.

WEIGHT: Packed, 40 lbs. Net, 27 lbs. Cubage 4.

DIMENSIONS: 19" wide, 10½" high, 13½" deep.

FINISH: Medium hand rubbed gloss gray with escutcheons in black.



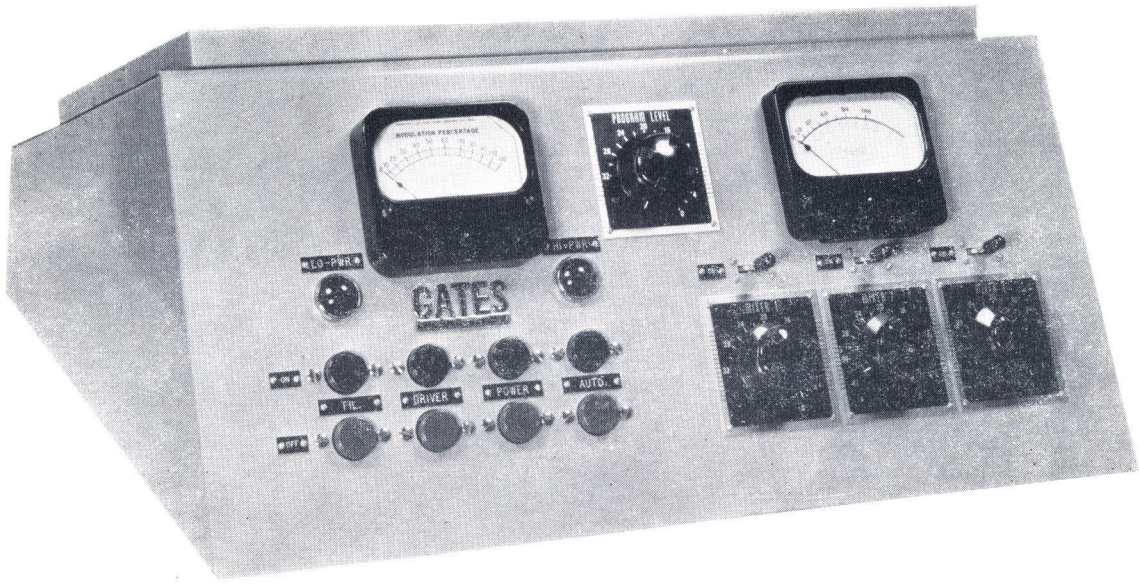
ORDERING INFORMATION

Modulation monitor complete with tubes	**MO-2639**
Modulation monitor complete with tubes	**MO-2639A**
100% set of spare tubes	**TK-113**

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GATES

TRANSMITTER CONTROL CONSOLE



For use with any standard or short wave broadcast transmitter to provide several input circuits, extension audio indicating meters, remote start/stop functions and associated indicator lamps. Functional diagram at bottom of page outlines generous facilities available. Where desk is desired, see Index (Desks).

SPECIFICATIONS

INPUTS: Three provided with line isolation transformer for each circuit, 50/150/600 ohms ladder type controls, 20 steps, 2 db each.

OUTPUT: 600 ohms.

MASTER GAIN: Balanced 30 step, 1.5 db per step.

VU METER: 4" square case with range control +4 to +40 VU in two VU steps for bridging 600 ohm line. Scale illuminated.

MODULATION METER (CCD-2 only): Gates A1363-2 as used in MO-2639 modulation monitor. Scale illuminated.

PUSH BUTTONS: Four pairs provided (black start-red stop) to cover all possible combinations including automatic reset as featured in many Gates models.

PILOT LIGHTS: Provided to indicate filament and plate on.

FINISH: Medium hand rubbed gloss gray with escutcheons in black.

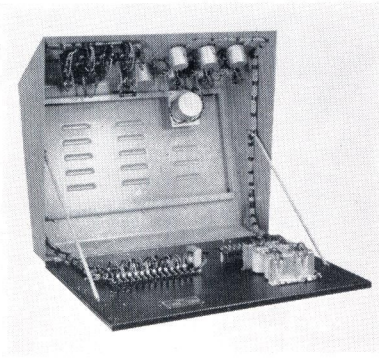
SIZE: 24" wide, 10" high, 21½" deep. Cabinet swings up from base for servicing. See illustration below.

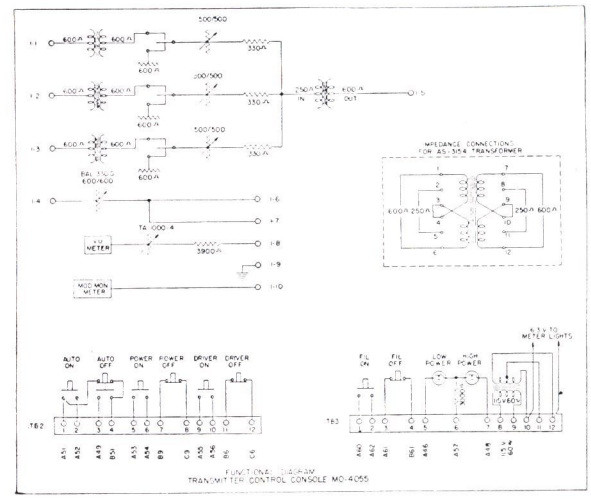
SHIPPING WEIGHT: 60 lbs.

ORDERING INFORMATION

Transmitter control console with extension modulation meter **CCD-2**

Same as above but modulation meter omitted and blank plate inserted **CCD-2A**

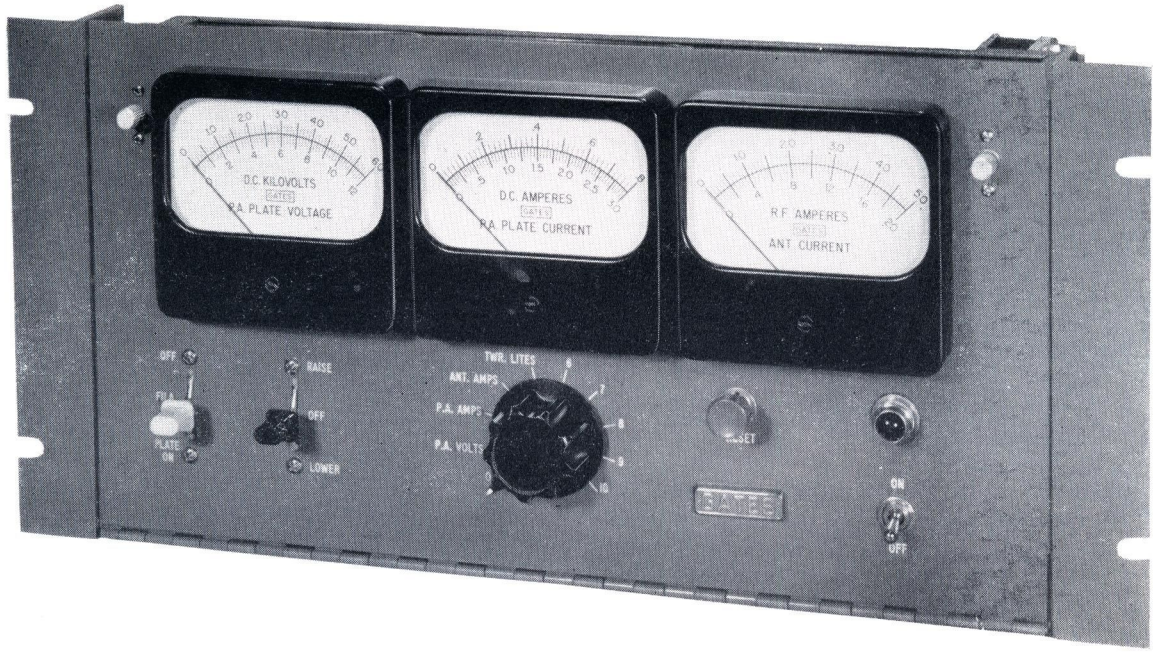




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GATES

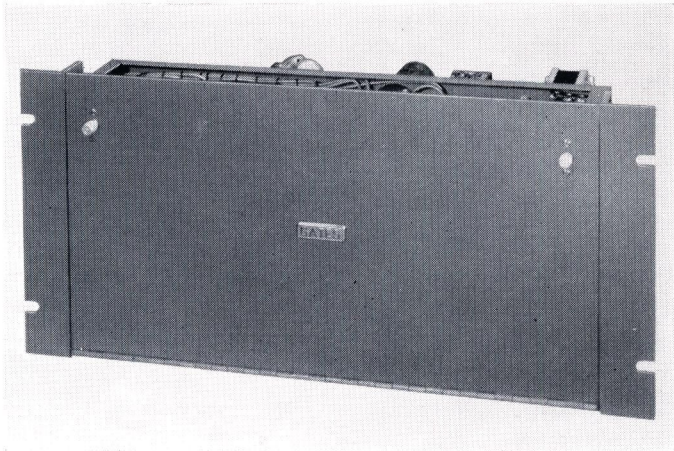
RDC-10 REMOTE CONTROL SYSTEM



For top quality, modest cost handling of one or two transmitters, the Gates RDC-10 system for unattended operation supplies every needed facility, and is backed by the world's major supplier of radio broadcast equipment.

Outstanding Features Are:

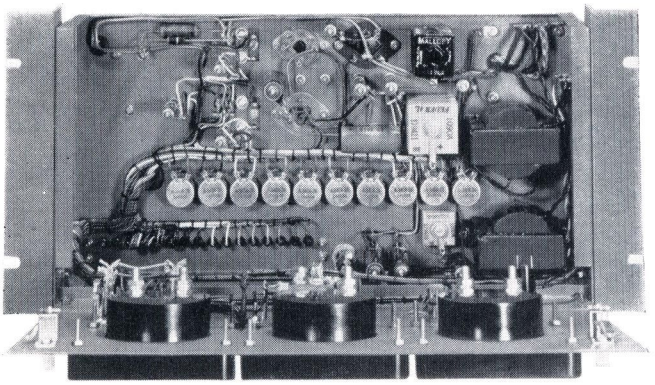
- 3 four-inch meters.
- 10 metering positions.
- 22 control functions possible.
- Positive action switch for meter selection— no dialing.
- Built-in relays for switching both filament and plate voltage.
- Constant voltage source provided for line checking.
- Abundantly meets FCC requirements.
- Drop down front panel to service.



The transmitter unit is absent of front panel controls, has drop down front panel to service and only requires 8¾"x19" panel space. Small size even allows mounting in some transmitters, where room prevails.

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RDC-10 REMOTE CONTROL SYSTEM



Studio unit has drop-down front panel so all parts can be reached from front of rack. Panel size of 8¾"x19" often conserves badly needed rack panel space.

THREE four-inch meters calibrated directly in DC volts, DC amperes and RF amperes assures accurate, easy to read metering even from across a room. Seven of ten metering circuits are directly connected. Three balanced stepping relay positions, brought to extra terminals, may be used for metering, studio-transmitter order phone and emergency program line.

CONTROL relays are inbuilt for filament and plate switching on and off as well as for controlling plate voltage via the motor tuned rheostat supplied. Fail-safe protection is provided on the filament control circuit. Up to 18 more switching functions may be handled by adding inexpensive relays though full facilities are provided in the standard equipment for broadcast transmitter operation.

WHAT IS SUPPLIED: Both studio and transmitter units as illustrated, plus M-4703 motor control plate voltage rheostat, antenna diode unit M-3759 for reading antenna current, M-4720 plate current unit for reading plate current of transmitter, M-4719 plate voltage unit for reading plate voltage and the inbuilt light indicator with external current transformer.

INSTALLATION is speedily and easily made. Basic units (studio and transmitter) are each 8¾"x19" in panel size. Terminal boards assure quick attachment of interwiring.

RECOMMENDED USAGE: May be used with all Gates broadcast transmitters listed in this catalog. 250, 500 and 1000 watt models require no basic equipment additions for transmitter remote control. — 5000 to 10,000 watt models usually require added motor tuning unit for variable loading coil.

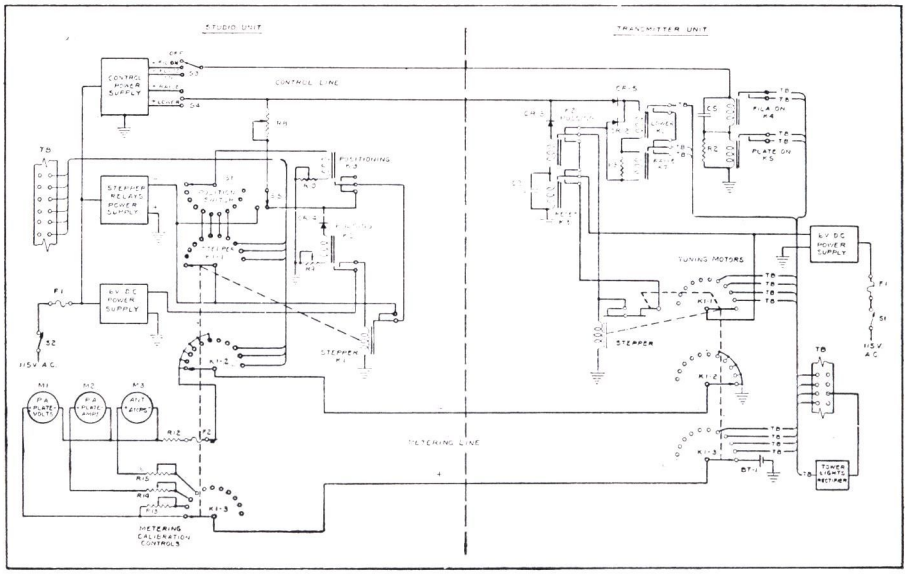
REMOTE MONITORING: Is accomplished through use of several accessories listed on following pages. Where modulation and/or frequency monitors are moved to studios, the model M-5144A RF amplifier is added.

WHEN ORDERING: State carrier power, make of transmitter, model number of transmitter, carrier frequency, and type of frequency and modulation monitors.

ORDERING INFORMATION

Remote control system complete with motor tuned rheostat, antenna diode, plate and voltage metering kits and tower light indicator, for powers up to and including 1KW RDC-10

Same as above but for powers up to and including 10KW RDC-10A

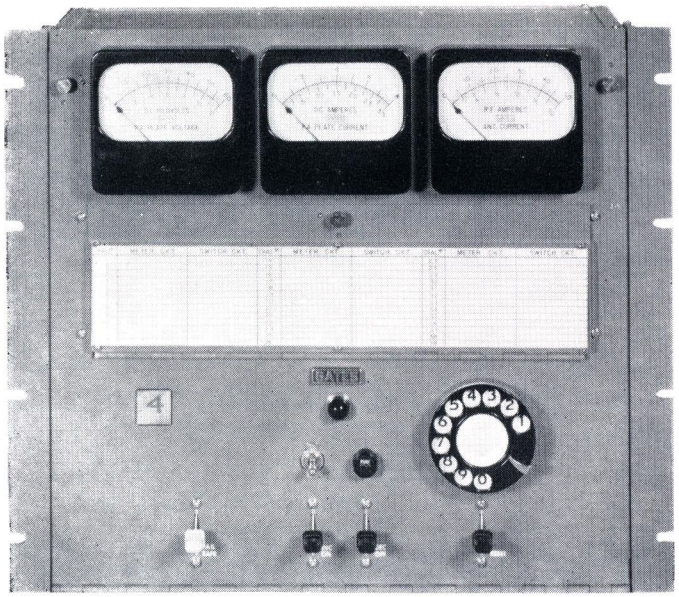


Functional line drawing of RDC-10 Remote Control System.

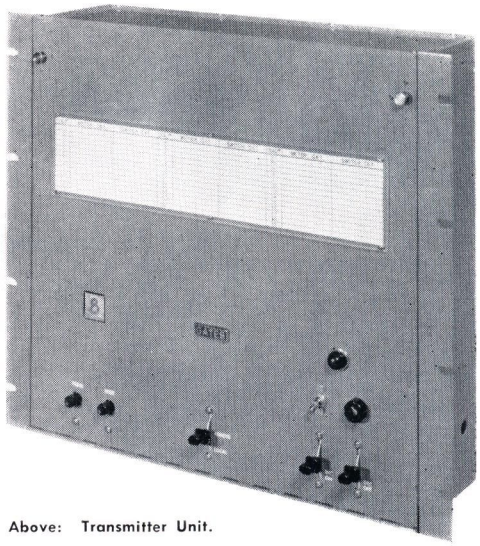
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GATES

RDC-200 DELUXE REMOTE CONTROL SYSTEM



Left: Studio Unit.



Above: Transmitter Unit.

Another 100% new Gates product for the expanding needs in remote control equipment. This system will handle the complicated directional system, several transmitters or the utmost in dependability for any transmitter power up to 50,000 watts.

Model RDC-200 is an advanced design of a DC operating system. Simplex, phantom or natural ground returns are eliminated in favor of a straight wire return. Two wire pairs are the maximum requirement for any requirement of one or several transmitters, directional operation, and tower light indication. With this system, wire lengths of as much as 60 miles provide no problem.

Highest current drain of any switching function is 3.125 MA, making the system almost impervious to line resistance change. These additional features will be of interest:

1. Provides 19 wired metering circuits, five of which are balanced pairs for monitors, phones, etc.
2. Only one-half of the 40-position stepper is wired to provide the 19 circuits (plus calibrate), leaving 20 added positions with spare terminal block provided, permitting 20 added meter circuits or 40 added switching circuits.
3. As wired, provides 38 switching circuits (which may be expanded to 78 positions, see Par. 2 above).
4. All DC control circuits. Operates through maximum loop resistance of 5000 ohms. Based on resistance of smallest underground cable, would equal 52 miles.
5. All necessary equipment for one transmitter is standard equipment. Includes: (a) plate current metering unit, (b) plate voltage metering unit, (c) plate voltage on and off relays, and (d) tower light indicator with current transformer.

STUDIO UNIT

6. Three 4" wide scale meters calibrated in plate volts, plate current and RF amperes. Pick the meter with the most appropriate scale for any other readings. 100 microampere meters used throughout.
7. 100% front panel accessibility via drop-down front panel. Panel size: 19"x15¾".
8. Function dialed indicated by illuminated number on front panel. Chart on front panel permits instant number to function observation for checking.

TRANSMITTER UNIT

9. Same light indication on transmitter unit, with chart as in Par. 8 above.
10. Through a combination of sensitive relays, polarizing diodes and biasing, positive control is insured at low current drain. Husky slave relays provide the necessary contact rating for external switching circuits.
11. Pulse, reset and all switching functions can be controlled from transmitter for local operation.
12. Complete front of rack accessibility through drop-down-to-service feature. Panel size: 19"x15¾".

All of the standard demands of complete remote control equipment will be found in the Gates RDC-200 to exceed FCC requirements including fail safe. Transmitter and studio units have self-contained power supplies and are independent operating units.

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GATES

REMOTE CONTROL ACCESSORIES

With RDC-200 the only special applications would be with the type and amount of accessory equipment. Page 93 lists a wide range of accessories usually required in multiple transmitter and directional operation. These may all be used with the RDC-200 system. — Where an extra special application is required, Gates engineers will be happy to place into action, the manufacture of this special need in its model shop, known for speed.

What Is Supplied!

As standard equipment, the following is supplied:

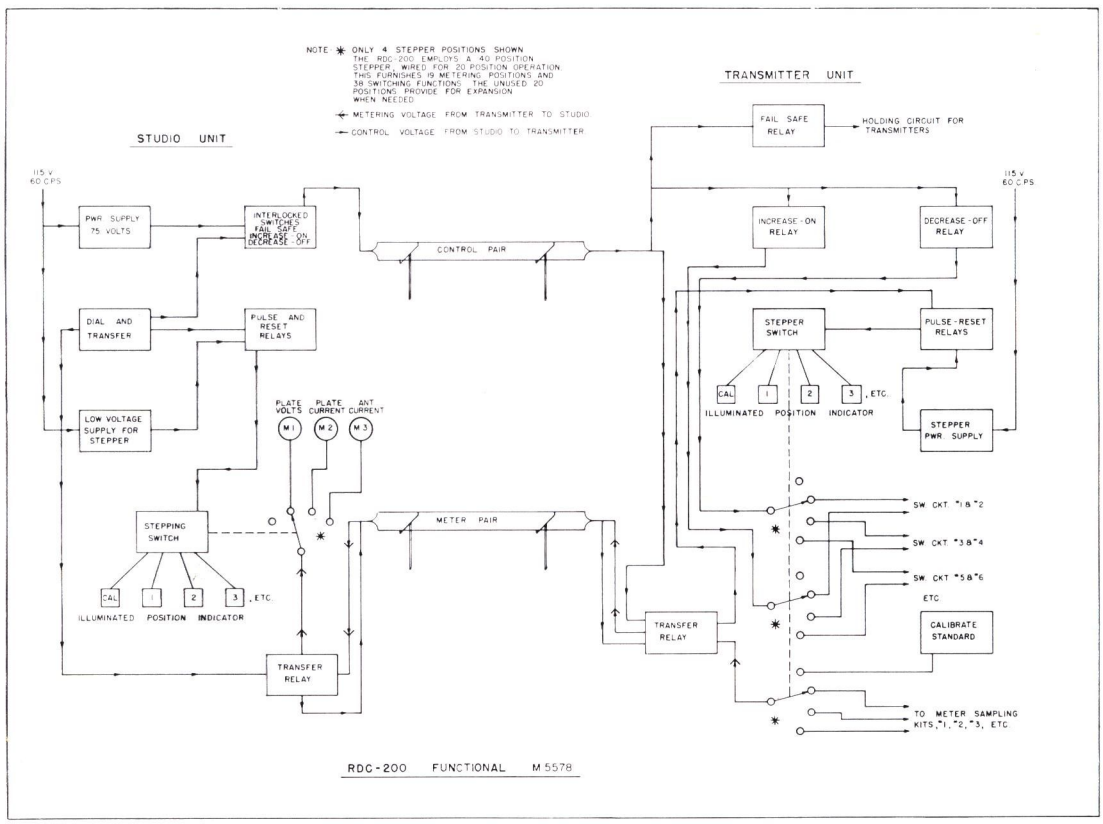
(a) Studio remote control unit.
(b) Transmitter remote control unit.
(c) M-4719 plate voltage metering unit.
(d) M-4720 plate current metering unit.
(e) Inbuilt plate start stop relays for one transmitter.
(f) Tower light indicator.

NOTE: Motor tuned plate voltage rheostats are listed on Page 93 for powers up to 1 KW and motor tuning assemblies for load adjustments of higher power transmitters. There are optional accessories for your particular need and should be ordered for the complete system. Where more than one transmitter is to be remote controlled, the M-5249 momentary control or M-5248 latching (hold type) control is employed (see Page 93).

ORDERING INFORMATION

Complete deluxe remote control system RDC-200

Extra tower light indicators (for multiple towers) M-5145



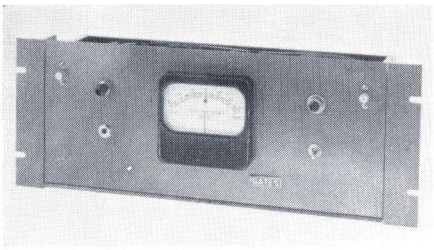
RDC-200 FUNCTIONAL M 5578

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GATES

ACCESSORIES FOR REMOTE CONTROL

Frequency Monitor Extension Meters



Used for extending Gates M-2890 monitors. Has 4" frequency indicating meter reading 30-0-30 cycles. Includes resistor pad for sampling voltage. Tubes: 6AW6, 6AQ5, 6AL5, 6X4 and OA2. For 115 volts, 50/60 cycles. Size: 7"x19"x7" deep.

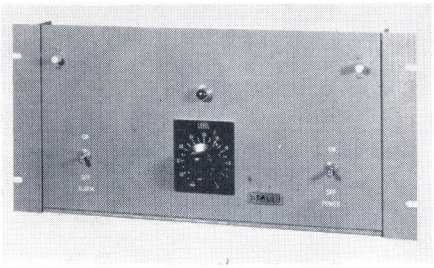
Frequency monitor extension unit M-5270

FOR M-4990 FREQUENCY MONITOR

Meter is exact duplicate of the M-4990 monitor (Page 84) for extending frequency indication to studios. On 5¼"x19" panel. Not illustrated.

Extension meter M-5631

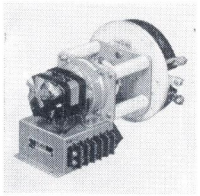
RF Amplifier M-5144A



Preferred method is to have frequency and modulation monitors at the studios where the operator may view the operation at all times. This unit picks up the off air signal, furnishes both modulated and unmodulated signal to Gates, GR or RCA frequency and modulation monitors. Includes audio output and carrier failure relay to operate external alarm. Power supply is self-contained. Drop down front panel for servicing all inner components. Supplied with complete antenna kit.

TUBES: (3) 6AU6, (2) 6BA6, (1) 1614, (1) 5V4G, (1) 6080, (1) OD3.
POWER: 115 volts, 50/60 cycles, 95 watts.
SIZE: 8¾"x19"x8" deep. Finish: Gray.

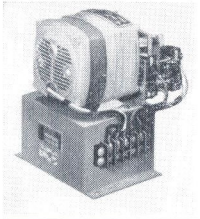
RF Amplifier with tubes M-5144A



Motor Operated Rheostat

Recommended for regulating the plate voltage in transmitters of 1 KW and less. Available in three sizes for 250, 500 and 1000 watt transmitters. Motor is one RPM and operates from 115 volts, 60 cycles.

Motor Rheostat for 250 watts M-4703A
Motor Rheostat for 500 watts M-4703B
Motor Rheostat for 1 kw M-4703C



Tuning Motor

This unit for tuning variable inductor, capacitor or other controls, has inbuilt limit switches. Five wire reversible motor 1 RPM. 20 lb. inches torque. Requires M-5806 relay assembly for control. 115 volts, 50/60 cycles.

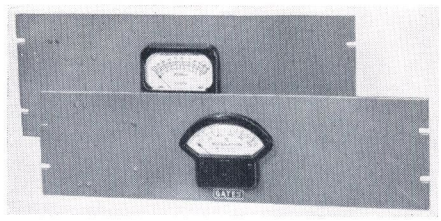
Tuning Motor M-5066

Tower Light Unit

This unit is used to provide a DC voltage for indication of proper tower light operation. Includes current transformer.

Tower Light Metering Kit M-5145

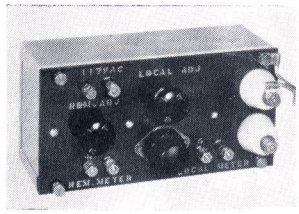
Monitor Extension Meters



Several types available as listed below for extending both frequency and modulation monitors. Meter is appropriate to type of monitor being used. Mounted on standard 19" rack panel 5¼" high.

Remote meter and panel for Gates M-4990 frequency monitor M-5631
For extending Gates MO-2639 modulation monitor M-5210
For GR1931A or RCA WM43A monitors M-5206
For GR1181A or RCA WF48A monitors M-5208
For RCA 66 Series monitors M-5207
For RCA 311A monitor M-5209

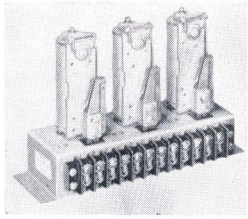
Antenna Diode Unit



The antenna diode unit is designed to provide remote metering of antenna current. A DC voltage proportional to the antenna current is returned to the studio unit via the metering line and measured on the directly calibrated antenna current meter. The unit pictured is the M-3759 for use with powers of 1 kw and under. A similar unit, the M-2765B is available for powers in excess of 1 kw. Tube: one type 6H6. Power requirements: 115 volts, 60 cycles.

Diode 1 kw or less M-3759
Diode 5 kw or more M-2765B

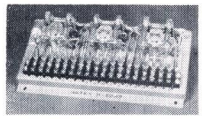
Relay Assembly



For controlling motors. Usually used where transmitters already incorporate tuning motors. Used with M-5066 tuning motor. As listed below, designed for control of one 3-wire motor or one 5-wire motor.

For 1 3-wire motor M-4801
For 1 5-wire motor M-4806

Auxiliary Relay Assembly



Auxiliary relay assembly to provide one on-off holding switching facility. These relays provide two sets of double throw double contacts rated at 8 amperes.

Auxiliary relay assembly M-5249
Same as above but latching (holding) type with 5 ampere contacts M-5248

Plate Voltage Unit

Supplied with all Gates Remote Control Systems and furnishes a sample of transmitter plate voltage for return via the metering line to the studio unit. One unit is used with voltages up to and including 6000 volts. For higher voltages, additional units may be connected in series. Also available as an accessory item for metering additional stages or transmitters.

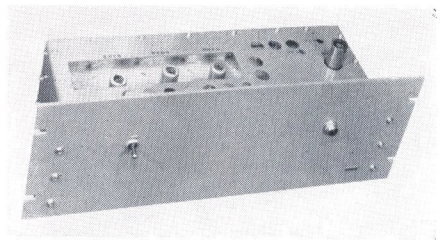
Plate Voltage Unit M-4719

Output Loading Control Kit

Complete kit to control output loading of Gates BC-5P 5 kw transmitter. It includes M-5066 and M-4806 relay and all necessary mounting hardware.

Output Loading Control Kit M-4848A

RF FM Amplifier M-4791

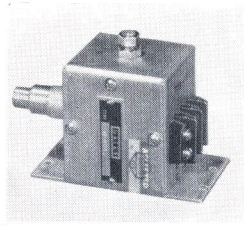


Operates with any approved FM frequency/modulation monitor where the signal is taken off the air and monitor is at studio. Amplifier supplied fixed tuned to your frequency. Power supply is not supplied. Requires 300 volts DC at 100 MA and 6.3 volts AC at 3 amperes. Use Gates PWR-3.

SIZE: 7"x19"x8" deep. Finish: medium gloss gray.
TUBES: 6AK5, 6BA6, 6AH6, 2E26, OA2.

RF FM Amplifier with tubes M-4791

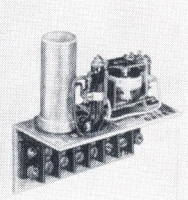
FM Output Indicator



Designed to sample the 51.5 ohm transmission line of an FM transmitter for measuring transmitter output as required by FCC. Provides a DC voltage which is measured on the studio unit metering system.

FM Output Indicator M-4845

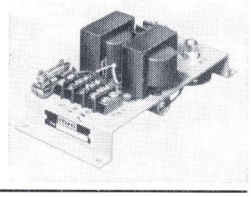
Overload Relay



Replaces circuit breakers in current or older models as circuit breakers are usually undependable for remote control. Tripping current adjustable. Inserted in cathode circuit of RF power amplifier. Some engineers prefer an additional unit in modulator circuit.

Overload Relay M-5129

AC Rectifier



Rectifies the AC voltage, either line or filament, at the transmitter and feeds back DC to studio unit for measuring AC by remote control.

AC Voltage Unit M-4825

Plate Current Unit

Included with the Gates Remote Control System. Furnishes a sample of plate current which is returned to the studio unit and measured on the directly calibrated plate current meter. The unit is provided with a high voltage fuse for personnel and line protection, and can be used for current ranges of .8 ampere and 3 amperes. Also available as an accessory item to provide metering for additional transmitters, or can be used with unit furnished with equipment when extended range is necessary.

Plate Current Unit M-4720

Tuning Motor Assembly

For operating rheostat, variable condenser, or any variable control. Three wire reversible motor 1 RPM. Torque 15 lb. inches. 115 volts, 50/60 cycles.

Tuning Motor M-4800

Special Equipment for Remote Control

Gates has made every effort to provide a most complete line of equipment for unattended operation. It is recognized that unusual situations of multiple transmitters or directional requirements may demand special accessories. Gates engineers will happily work with our customers on any special application.

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PACKAGED AM RADIO STATIONS

STUDIO PACKAGE

1—Yard 8-channel speech input console listed Page 104. Includes inbuilt cueing amplifier/speaker, self-contained power supply and 10 watt ultra linear monitoring amplifier.

1—Desk for Yard console as illustrated, Model M-5528.

2—CB-225A transcription turntables with dual diamond stylus for standard and microgroove, preamplifiers, equalizers, power supplies and ready to use. See Page 135.

1—Artility Model 255 adjustable, swivel and castered control room chair.

1—Argus Model DBR-2 bass reflex loudspeaker enclosure for control room monitoring.

2—Wall baffles for 12" speakers for studios and/or reception room, Model DWB-12.

3—Jensen P12T" dynamic loudspeakers.

1—M-5611 record/tape cabinet for discs and tape. Page 147.

1—Seth Thomas 15" studio clock, Page 131.

1—Atlas BS-36 microphone boom stand.

1—Atlas DS-7 microphone desk stand.

1—Electro-Voice 654 Slim-Trim dynamic microphone.

1—Shure 556-S cardioid mic.

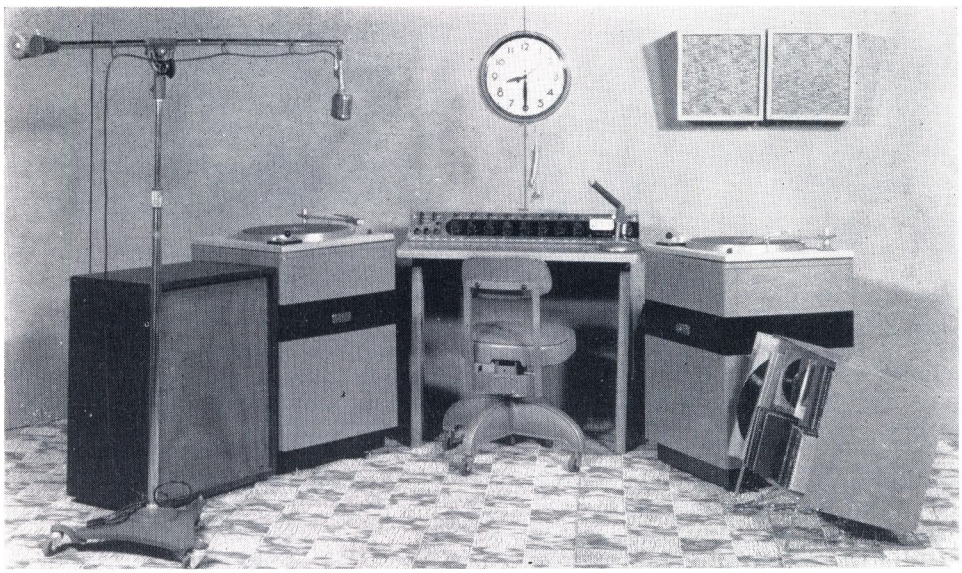
500' 2-wire shielded studio wire (not illustrated).

3—Cannon XL3-12 microphone connectors (not illustrated).

3—Cannon XL3-35 wall plate microphone receptacles (not illustrated).

1—Cabinet to hold studio portion of RDC-10 remote control unit (not illustrated).

Complete studio package as listed above M-5639



This complete studio package includes all basic equipment for modern broadcasting and offers complete control facilities combined with attractive appearance.

TRANSMITTER PACKAGE

Choice of complete GY transmitter packages are listed on Page 58 for 250, 500 and 1000 watts, these include:

1—Transmitter with tubes, cystal and for either 25, 500 or 1000 watts as selected.

1—Extra crystal in vacuum holder.

1—FCC set of spare tubes.

1—Complete accessary cabinet with the following mounted and wired therein:

M-4990 FCC approved frequency monitor
MO-2639 FCC approved modulation monitor
SA-39B limiting amplifier
Switching panel
RDC-10 remote control system for unattended operation

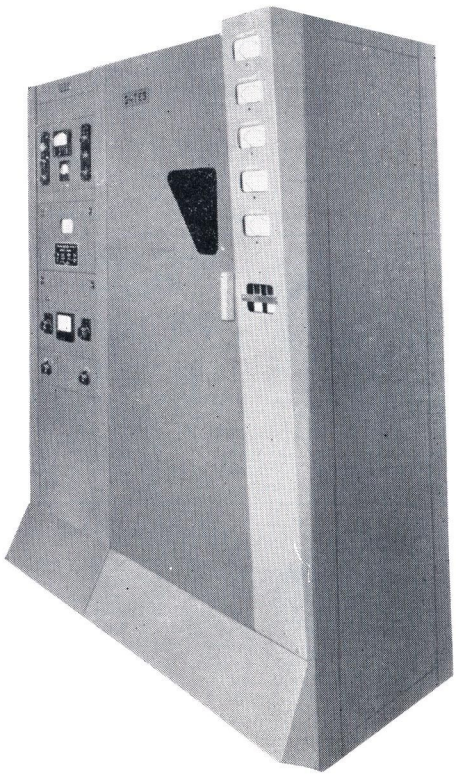
1—Antenna coupler, Model 44, Page 81.

1—Tower choke M-3935, Page 83.

Complete transmitter package as listed above M-5643*

* Transmitter supplied at power ordered.

Listed herein is all necessary basic equipment for the complete radio broadcasting station from microphone to antenna. Only optional equipment has been omitted such as transmission line nad the minor accessories which vary with each installation. The combination of studio and transmitting equipment is considered substantially above average in quantity, quality and facilities offered.



Listed in greater detail on Page 58, the popular GY series complete transmitting plants are ready to attach to studio and transmission lines. When combined with the studio package above, a complete microphone to tower installation is ready to install.

ORDERING INFORMATION

Complete studio and transmitter package for 250 watts M-5640
Same as above but for 500 watts M-5641
Same as above but for 1000 watts M-5642

Includes all equipment listed on this page. Purchaser may substitute freely to suit his own requirements. Example: If Gatesway console preferred to Yard console, deduct price of Yard and Yard desk and add price of Gatesway (Page 100) and M-5371 desk (Page 147).

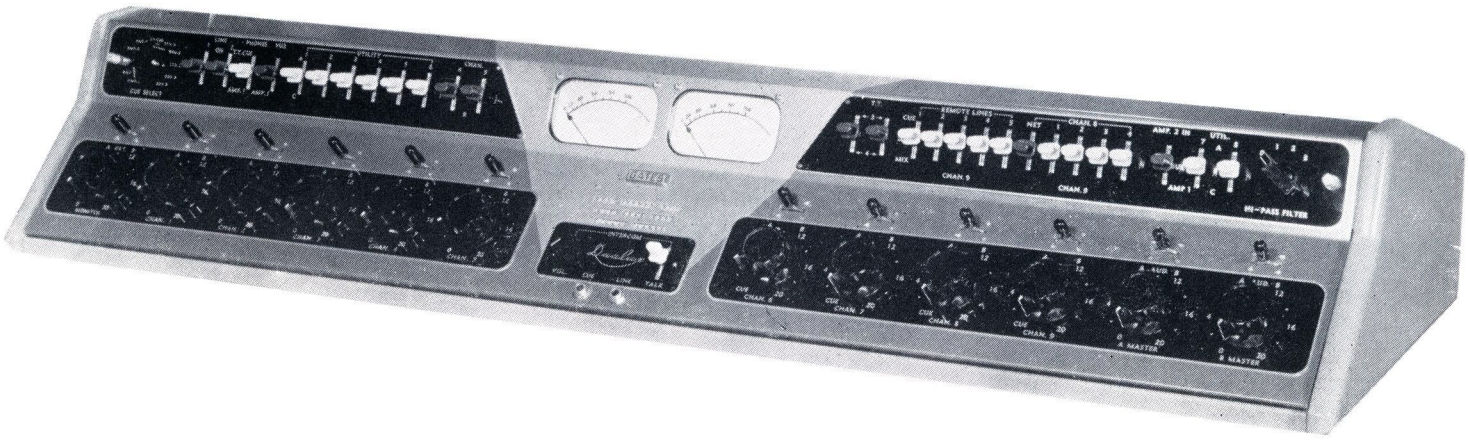
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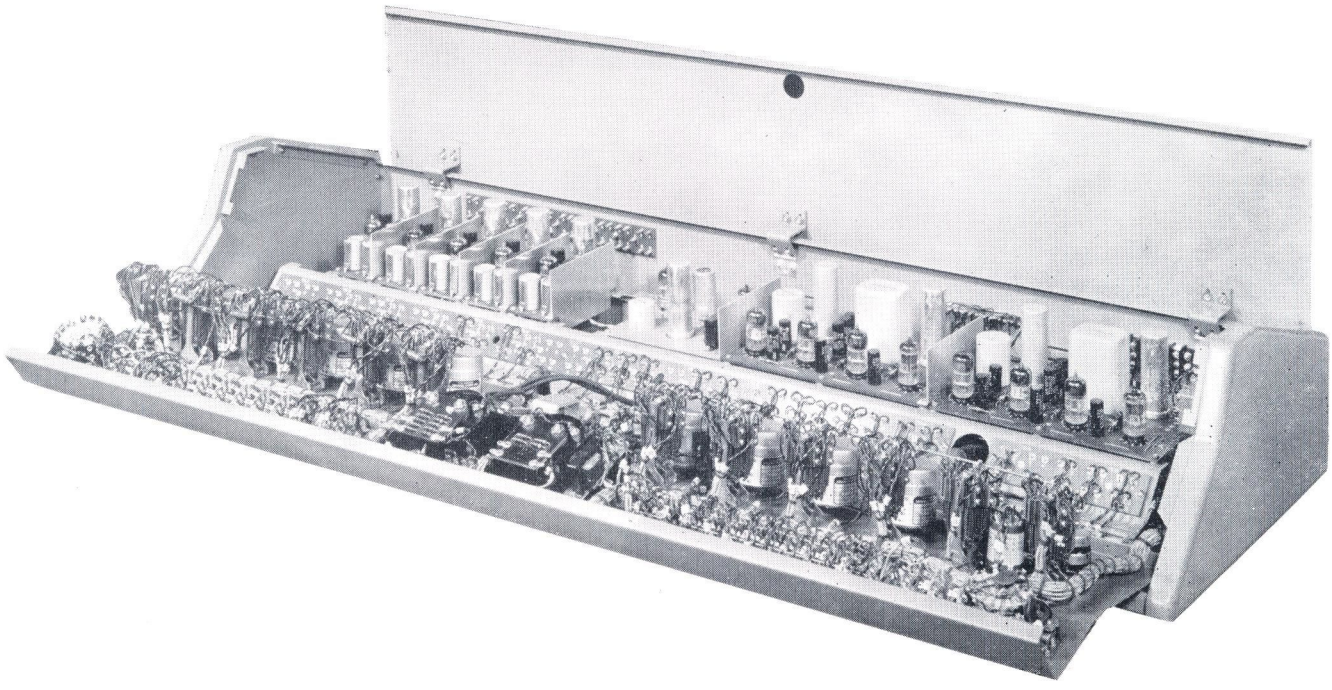
If You Didn't Get This From My Site,
Then It Was Stolen From...
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GATES

DUALUX DUAL SPEECH INPUT EQUIPMENT



Dualux is one of the finest in the long line of illustrious speech input consoles manufactured by Gates. Study of the specifications and a glance at the block diagram makes self-evident the statement, "No standard speech input system on the market today will equal Dualux." One Dualux extra, the cue-intercom system, permits direct front panel loudspeaker listening on all major circuits plus talk-back to remotes and studios. The Dualux not only incorporates every feature the discriminating broadcaster could demand but many additional functional and manufacturing extras that place Dualux in a class by itself.



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GATES

DUALUX SPECIFICATIONS

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

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

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

MUTING: All mixing channel keys provide switch contacts and are wired to operate 3 muting relays located on drop panel housing. Muting relays also accommodate warning light switching and intercom speaker muting. Room for two added relays is provided.

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

POWER SUPPLY: Gates heavy duty fully regulated. Relays are powered from main power supply and located inside of drop-panel housing.

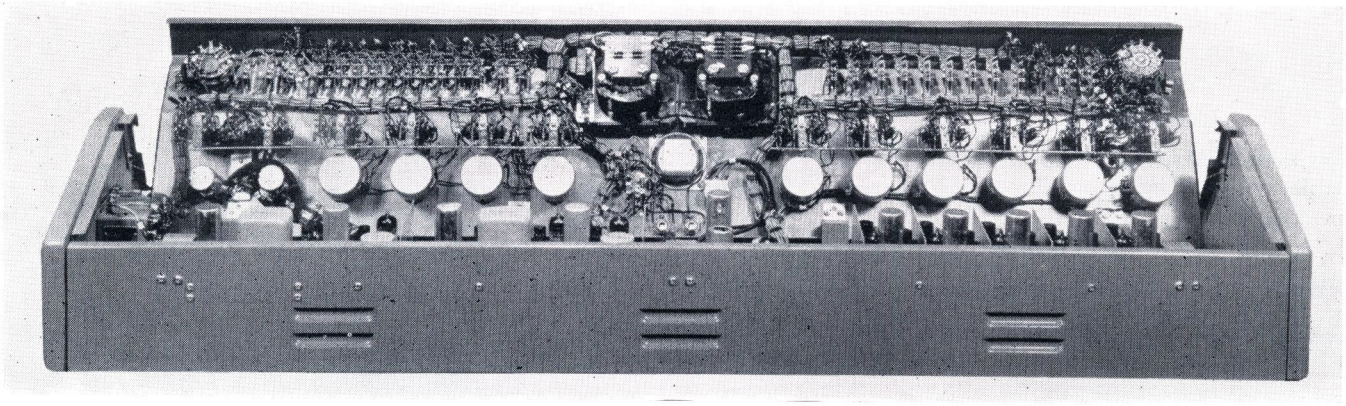
EQUALIZER (High-Pass Filter): Direct front panel control for Program Channel A flat position and 3 selected response curves allows immediate elimination of hum, rumble or extraneous circuit noise at low frequencies. (See response curves).

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

- Interlocked and cannot interfere with programming.
- 8 external intercom circuits selected with front panel switch.
- 8 cueing circuits selected with front panel switch.
- Automatic gain cue-intercom amplifier takes care of level variations within 20 db.
- All inputs and outputs padded, plus isolation networks where necessary, to allow selection of any circuit without adjusting gain control where levels within 20 db of normal.
- Front panel phone jack will cut cue speaker when phone plug inserted.
- Intercom system will listen and talk back on following circuits:

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

* Listen only.



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

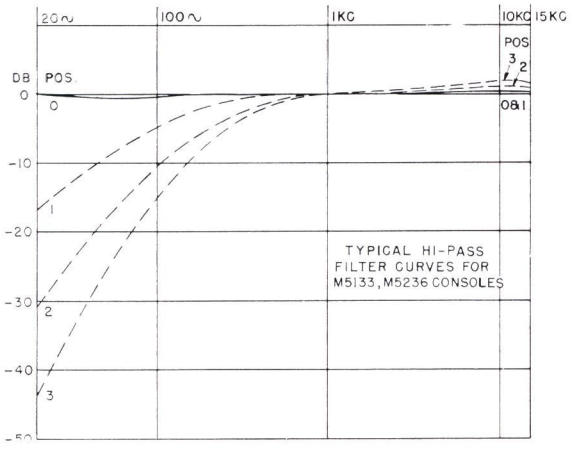
REMOTE LINES: 5 switched into channel 9, also into cueing system. Each remote key has off/talk-back/override positions. Duplicate line isolation transformers in channels 8 and 9 to handle any unbalanced condition.

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

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DUALUX SPECIFICATIONS



Graph showing four curves Dualux front panel control equalizer.

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

POWER: 115 volts, 50/60 cycles.

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

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

RESPONSE: Overall or any segment of program circuit, ±1.5 db, 30-15,000 cycles.

MONITORING AMPLIFIER: ±2 db, 30 to 15,000 cycles.

DISTORTION: Any program circuit or segment thereof, 1% or less, 30-15,000 cycles at +8 dbm. 1.5% or less, 30-15,000 cycles at +18 dbm.

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

MONITORING CIRCUIT: 60 db below +30 dbm output.

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

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

STYLING AND CONSTRUCTION: Fingertip operation for all controls. Dualux is only 7½" high for easy over the top vision. Front panel hinges down to service. Audio amplifier strip hinges up. Panel slope correct for easy upper line vision and control. Non-glaring finish where used in TV. Desk (designed exclusively for Dualux) optional. Rear inside has three wiring troughs to conceal wiring from console to floor. Top is formed linen formica over seasoned 5-ply birch. Sides 16 gg. cold rolled stretcher level furniture steel. Finished in medium gloss gray. Leveling screws provided on all four corners. Size: Height 29". Adjustable to 30". Top 30" front to back, 47" wide.

SIZE (Dualux): 46½" wide, 7½" high, 15" deep.

TOTAL NET WEIGHT: 101 lbs.

PACKED WEIGHT: 205 lbs.

EXPORT WEIGHT: 290 lbs.

CUBAGE: 9.

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



Console desk designed exclusively for Dualux.

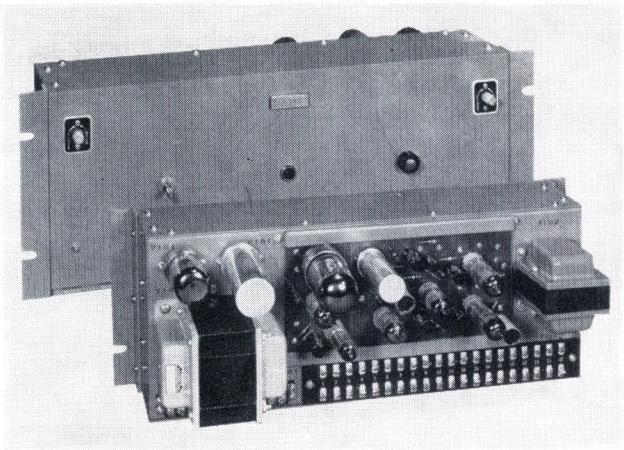
For other desks please refer to pages 132 and 147.

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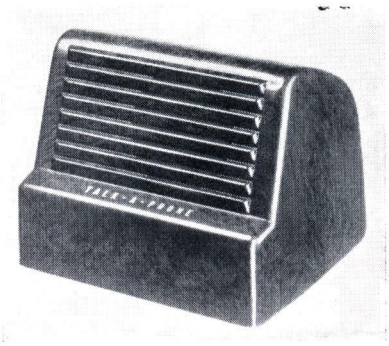
GATES

DUALUX — ORDERING INFORMATION

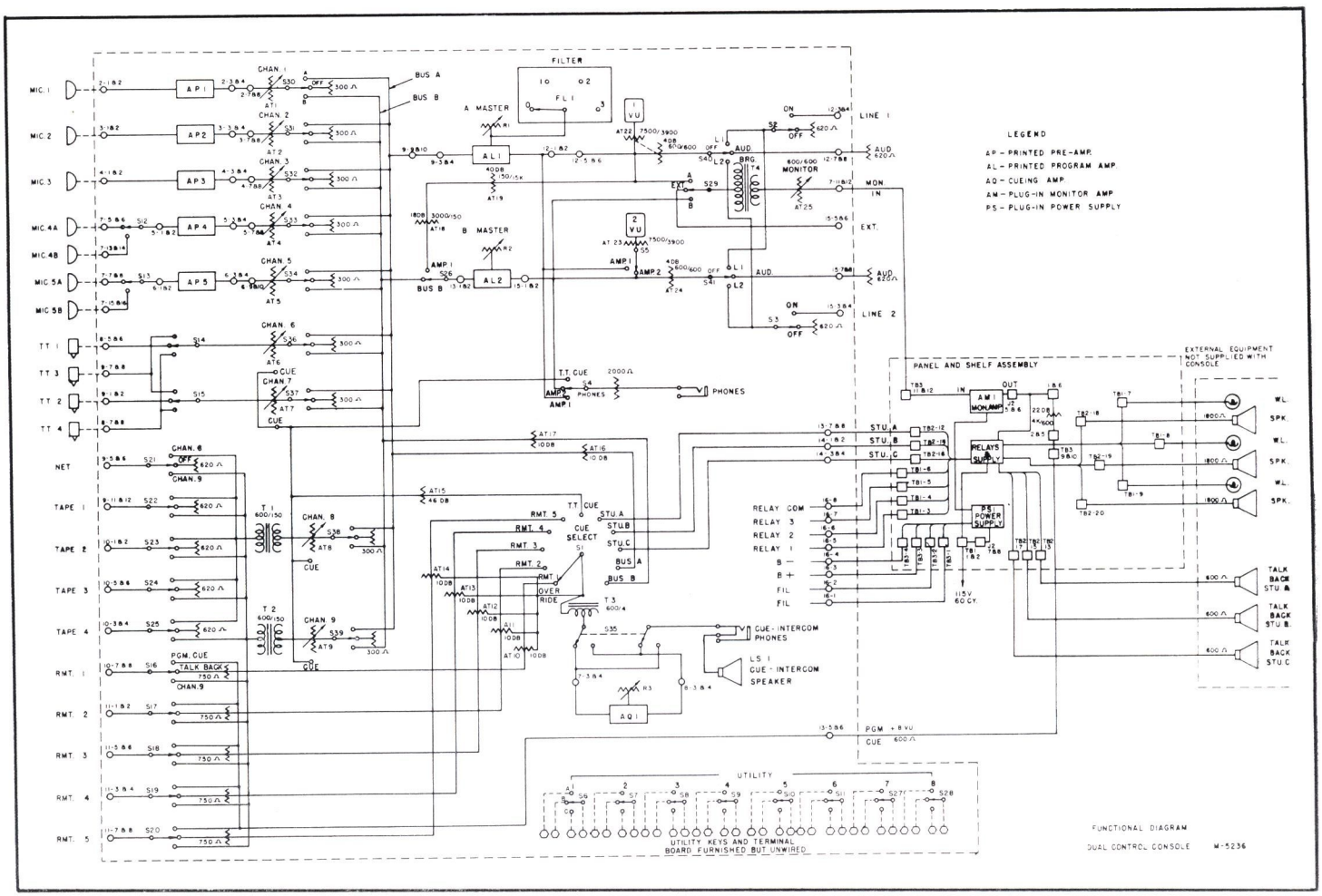
Dualux dual channel speech input console complete with tubes, ready to use	**M-5236A**
100% spare tube complement for above	**TK-294**
Intercom sub-station (optional) for studio use	**M-5303**
Desk (optional)	**M-5372**
Preamplifiers (room provided for two extra)	**M-5304**
Extra relays for additional muting, etc.	**AK-11939**



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



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



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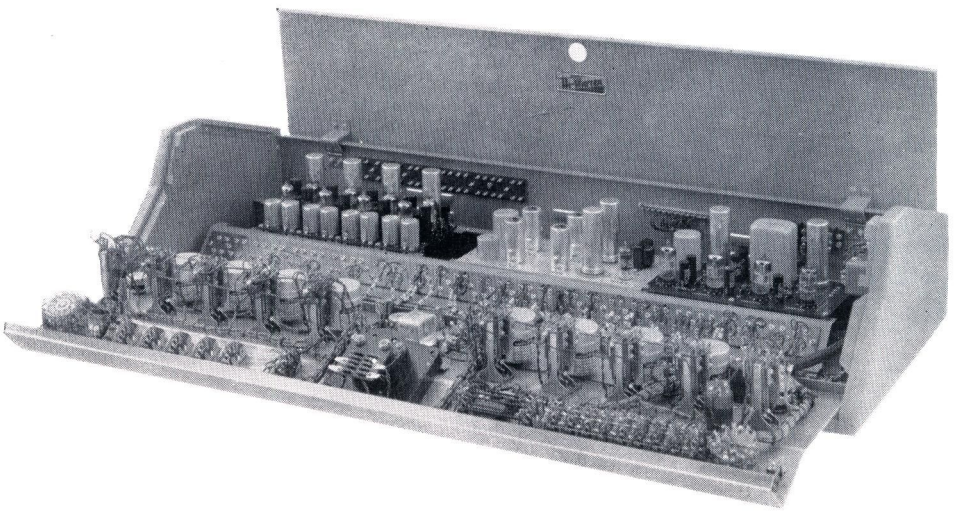
GATES

GATESWAY SPEECH INPUT EQUIPMENT



Years of extensive research in speech input systems are reflected in the Gatesway, a truly outstanding audio system. Modern for TV and modern for radio. Equally so for recording studios and university workshops. Each control seems to fall in the correct place — functional design at the finest. Printed wiring adds to reliability, easy serviceability, and best of all, more value at lower cost.

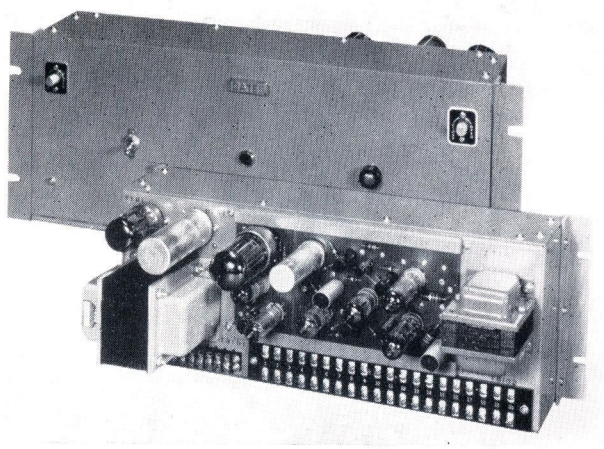
By observing the specifications and illustrations on the following pages, the engineer will quickly note that the Gatesway is quality speech equipment all the way.



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GATES

GATESWAY CONSOLE SPECIFICATIONS



Power supply and monitoring unit; drop-panel housing.

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

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

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

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

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

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

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

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

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

EQUALIZER CONTROL: Four positions: off and 3 degrees of low frequency cut-off (see curve).

INTERCOM KEY: Push down to talk, normal position to listen.

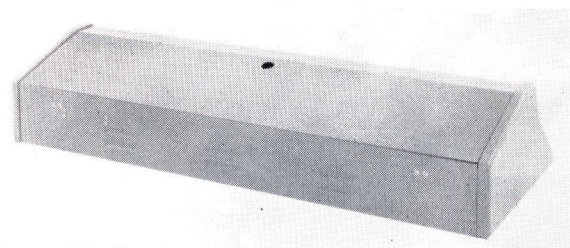
JACKS: For phones, 2 supplied, to listen on program line and cue amp. Use of phones on cue amp disconnects speaker.

OUTPUT EMERGENCY KEY: Located above master gain. In case of failure of program amplifier, the output of the monitoring amplifier may be instantly connected to the program line. Does not disconnect loudspeakers.

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

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

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

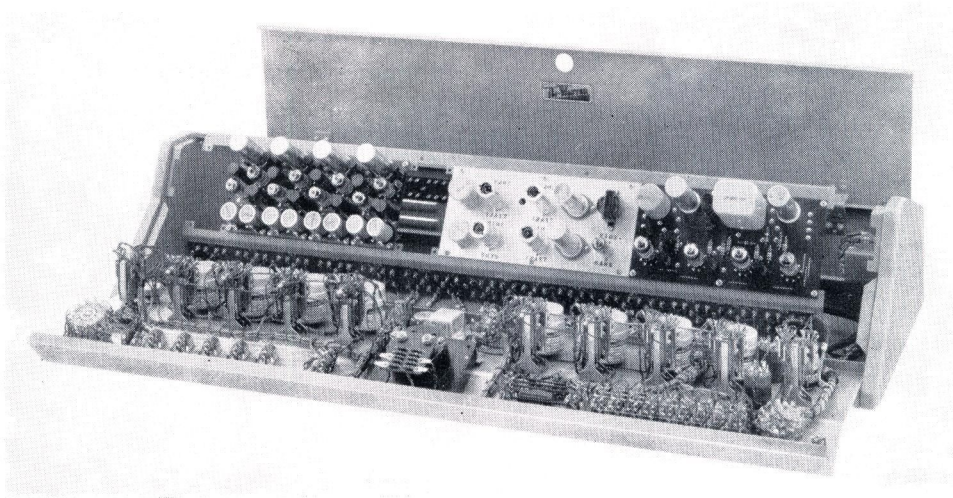


Rear view illustrates how console may be set against wall, as all terminations are made on inside for both electrical and mechanical protection.

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GATESWAY CONSOLE SPECIFICATIONS



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

IMPEDANCES:

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

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

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

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

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

NOTE: All gains stated ±2 db.

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

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

NOISE: Program circuit . . . 60 db or better below +8 dbm measured at —60 dbm input. Monitoring amplifier . . . 65 db below +38 dbm output.

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

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

RELAYS: 3 provided, telephone type with contacts for muting loudspeakers and breaks 115 volt circuit for warning lights up to 60 watts per light. Room for 2 added relays on chassis where unusual muting or control requirements exist. Relays operate from console power supply.

SIZE: 39" wide, 15" front to back, 7½" high. Height (lid up), 12½".

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

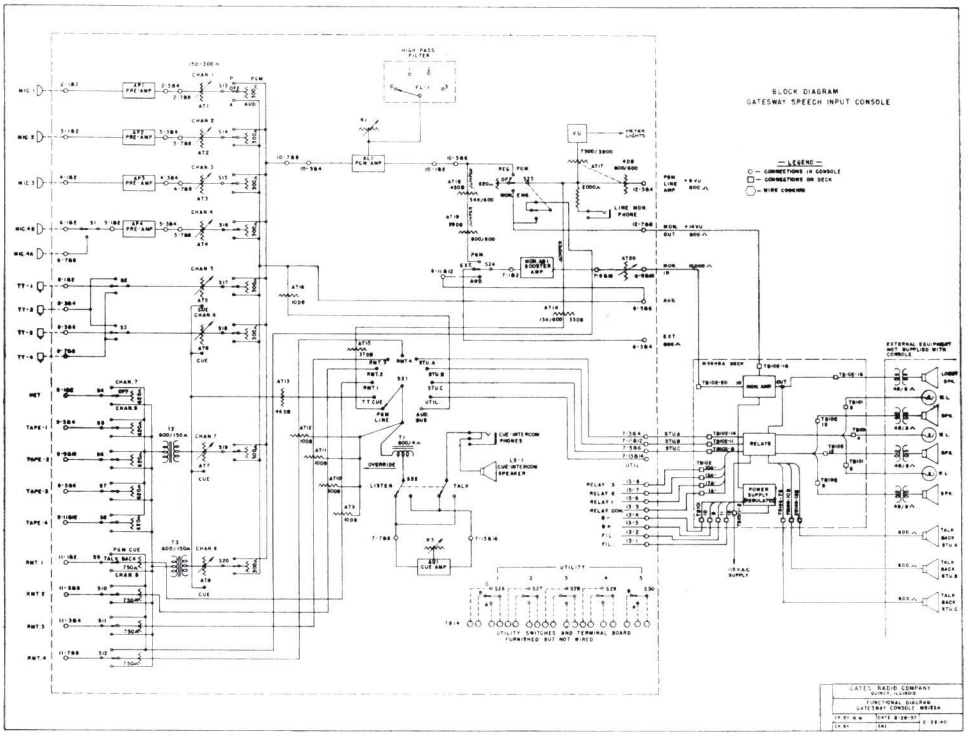
PRIMARY POWER: 115 volts, 50/60 cycles, approximately 105 watts.

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

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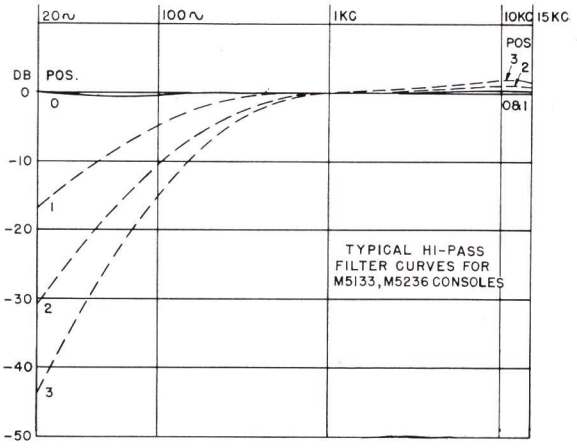
GATESWAY CONSOLE



ORDERING INFORMATION

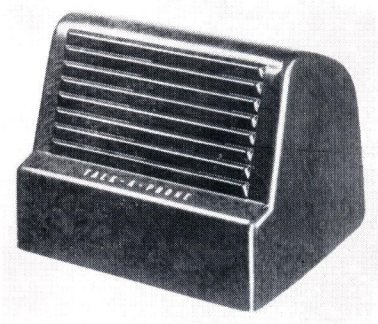
Gatesway speech input console with tubes, relays, complete ready to install	**M-5133A**
Extra relays for additional muting, etc.	**AK-11939**
Sub-station for intercom use only, includes matching transformer	**M-5303**
100% spare tube complement	**TK-290**

For desks please refer to pages 132 and 147.



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

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

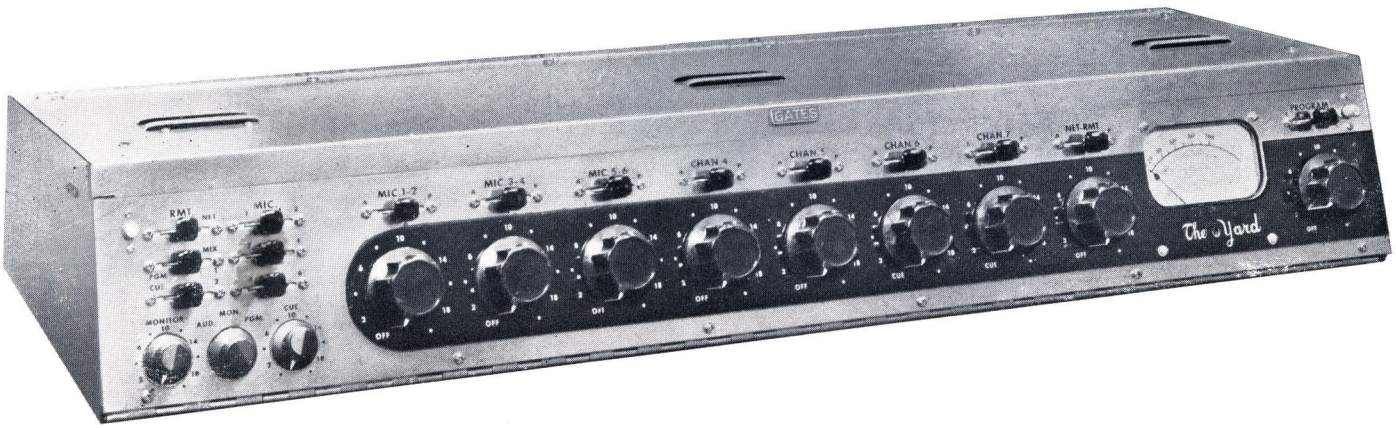


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THE NEW "YARD"--- 8 CHANNEL SPEECH INPUT CONSOLE

(For Radio and Television)



Another completely new, modern, wide facility speech input system that will fit a modest budget and yet will allow needed expansion at any future date. The **new** Yard has many added features over the popular predecessor of the same name but the same **low and yard wide** modern styling remains. The styling and functional utility that acclaimed the Yard as the most advanced design in speech input consoles in a decade.

Functions of the Yard are equally well adapted to either radio or television studio control. Eight mixing channels may accommodate many combinations of microphones, turntables, tape playbacks and projectors, plus provision for network and remote lines. Standard equipment includes three preamplifiers with input switching for six microphones. Space is allowed for as many as five more preamplifiers or, where desired, a preamplifier for each of the eight mixing channels.

Inbuilt cueing amplifier and speaker, 10 watt ultra linear monitoring amplifier, high overall gain, wide switching facilities and ease in servicing highlight the detail found on the following pages.

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THE "YARD" IS BROADCASTING'S FEATURE-VALUE SPEECH INPUT SYSTEM

Few speech input systems offer as many features as the **new** "Yard". No speech input system approaches the "Yard" low cost to feature ratio. When appraising the following feature highlights and then glancing at the modest selling price, the engineer quickly recognizes the true meaning of **manufacturing engineering** at the fullest fruition.

1. Eight mixing channels key selected to pro-program or monitor bus.

2. Space for 8 preamplifiers (3 supplied standard).

3. Six microphone inputs to 3 preamplifiers supplied with maximum capabilities of 11 microphone inputs if all 8 preamplifiers are used.

4. Inbuilt cue-amplifier and speaker for turn-table/projector channels and remote lines.

5. Ultra linear 10 watt monitoring amplifier at 1% distortion.

6. Dual muting relays with space for 3 more where needed. Warning light contacts on each relay.

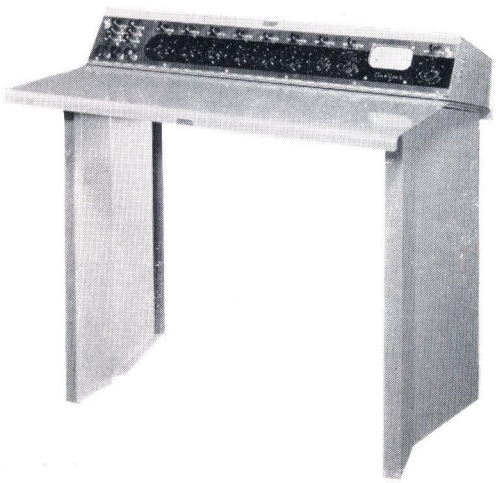
7. For uniformity and trouble-free perform-ance, all amplifiers are printed wiring.

8. Regulated power supply with capacity for all 8 preamplifiers and up to 5 muting relays.

9. Step type attenuators for all mixing channels.

10. Low impedance mixing throughout.

11. High fidelity throughout.



The "Yard" mounted on the optional M-5528 desk. This desk is only available when purchased with the "Yard" and cost is negligible. — Constructed of 16 gg. furniture grade stretcher level steel. Finish is in medium gloss gray to match "Yard" cabinet finish. Size: 30" high (to shelf level), 12" from front of shelf to front of console, 25½" deep overall and 36" (one yard) wide.

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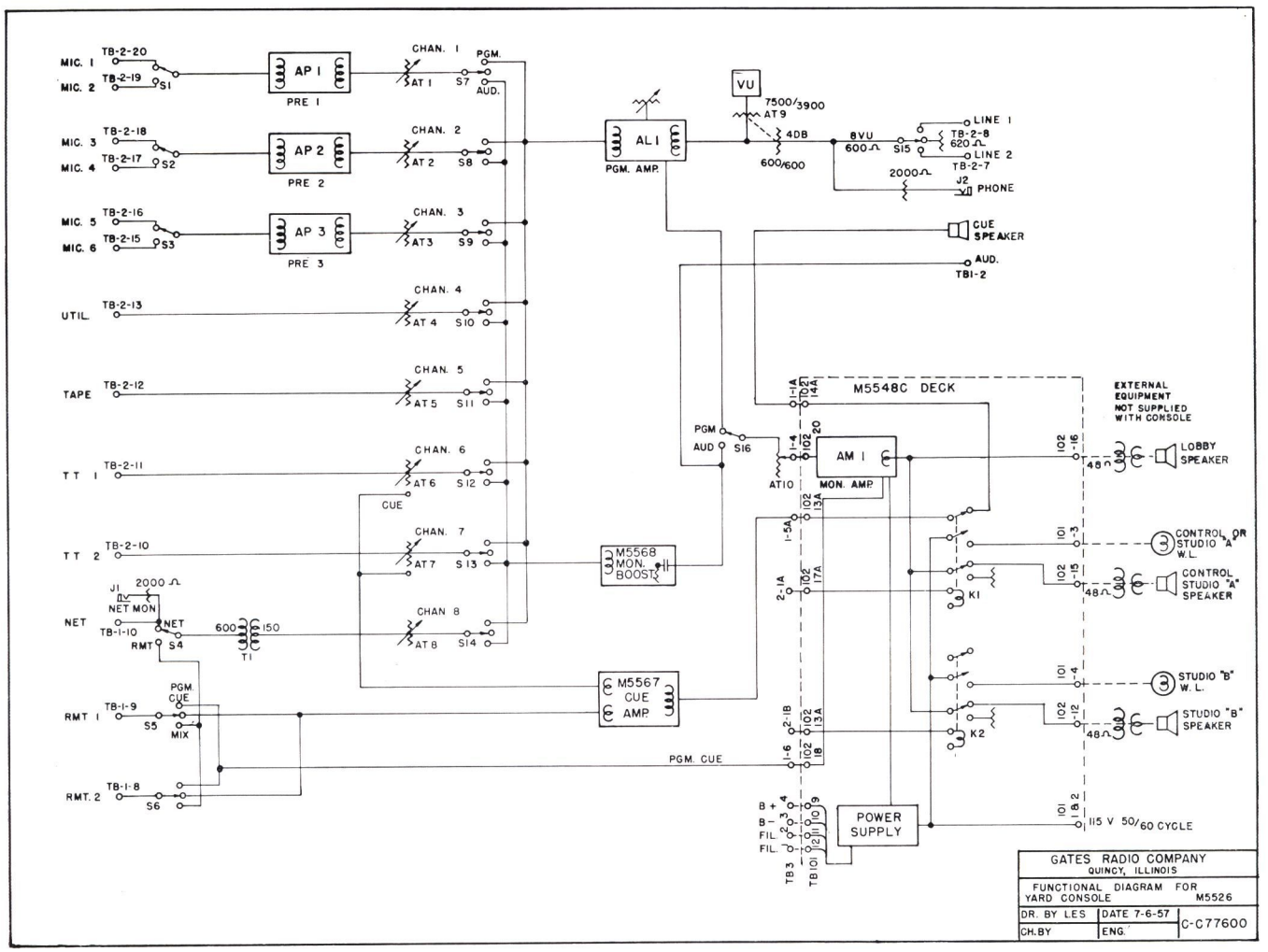
GATES

"YARD" GENERAL INFORMATION

NAME: The word "Yard" was suggested by the design engineer. When observing the ease of switching cars in a modern electronic controlled railroad yard and noting the similarity in ease of audio control, he commented, "Let's call this modern speech input system 'The Yard'." Being exactly 36" or a yard wide, the name became definite.

DESIGN: Functional design and human engineering played an important part in "Yard" design. Master gain is to the extreme right and is isolated from other controls by the 4" illuminated VU meter which functionally falls adjacent to the master gain. The meter glass is flush with the panel and the absent bulky meter case cannot obstruct the smooth moving from control to control for fast, errorless operation. Secondary controls such as remote line switching, monitor gain, cue-amplifier gain, etc., are all located to the extreme left. This leaves the main center position of the console to the one and important purpose of — control. Overall height of the "Yard" is only 5¾" for easy over the top viewing in either radio or television production. Panel is anodized aluminum in natural and black. Cabinet finish is gloss gray.

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



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THE "YARD"

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

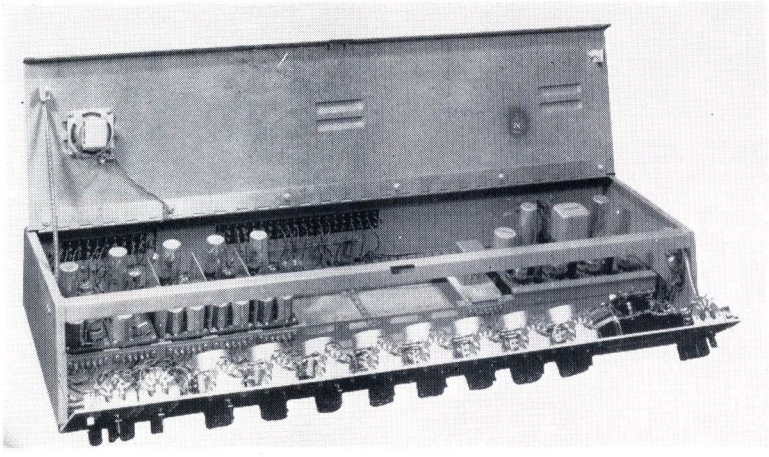
PREAMPLIFIERS: Three are provided as standard. Room is available for five more. Each of the three preamplifiers has an input key to select two microphones to each preamplifier, giving a six microphone capacity. Muting relays may be connected in any usable combination with both input and mixing channel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

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

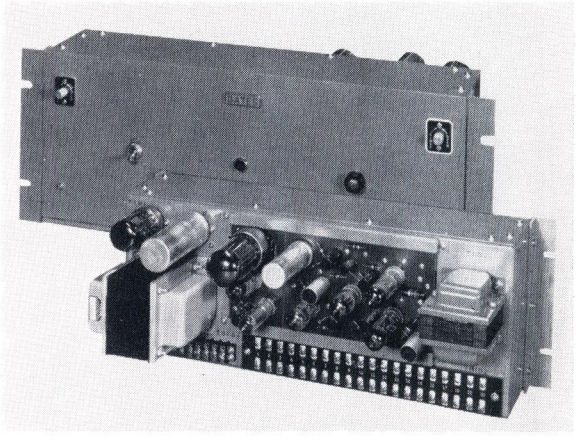
MONITORING AMPLIFIER: In today's modern broadcasting, loudspeaker distribution is increasingly important. Standard "Yard" equipment includes an ultra linear 10 watt, 1% distortion amplifier. The popular EL84 tubes are utilized in the push-pull output circuit.

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

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



The "Yard" opens up completely for fast servicing, tube change and cleaning. Three preamplifiers are standard equipment but note the room provided for five more.



Monitoring amplifier, regulated power supply and muting relays are a separate husky rack or desk mount unit. Note the clean uniform and easy to service "printed wiring".

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GATES

THE "YARD"

POWER SUPPLY is fully regulated employing a 4-tube circuit and electronic filtering for low noise. All filament, plate and relay voltages are provided. This unit, combined with the monitoring amplifier and muting relays is separately illustrated.

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

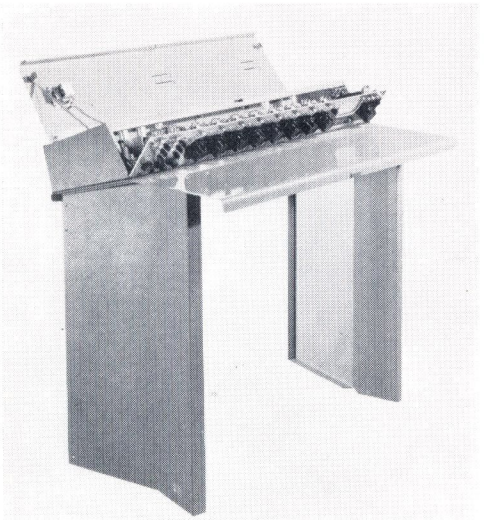
REMOTE/NET KEYS: Three incoming lines are selected by three keys to the extreme left. All lines feed through a line isolation transformer. The two remote lines are selectable to "Program Cue," "Cueing Amplifier" and "Broadcast." The "Network" key may be used for a remote line where the station is independent.

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

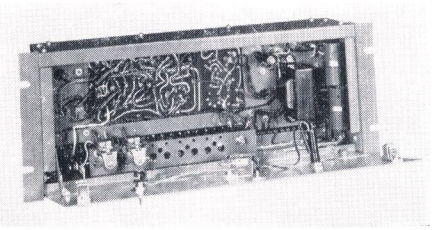
OUTPUT KEY: Selects the output of the program amplifier to a choice of two lines.

PRINTED WIRING: For perhaps the first time in any speech input console, all amplifiers and the power supply are constructed 100% on heavy printed wiring boards. Printed wiring is often confused with printed circuit. Printed wiring is defined as etching heavy copper wiring on formica. This is done with special machinery in the Gates plant. The advantages are many-fold. Top in importance is absolute uniformity. Performance is always the same. By eliminating the point to point wiring cost and including the always errorless wiring result of printed wiring, the cost saving can obviously be invested in greater facilities and finer materials without increase in selling price. For those who may be cautious, it is well to know that printed wiring is approved in many delicate equipments manufactured by Gates for the United States Signal Corps.

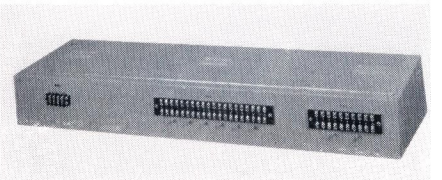
TERMINATIONS are to numbered terminal boards and installation is simplified by easy accessibility to all terminals.



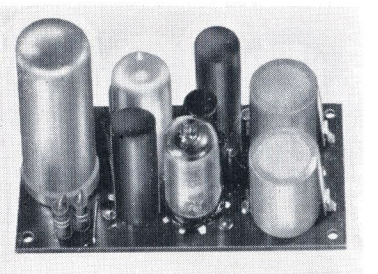
Yard utility cannot be denied in this open view on the optional M-5528 desk. The desk, when purchased with the Yard, is negligible in cost.



The front panel drops down to reach the muting relays. Two are standard but punch-outs are provided for three more if ever needed.



The back of the Yard is simplicity. Wiring is to numbered screw terminals.



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

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GATES

"YARD" SPECIFICATIONS

GAIN: (a) Any preamplifier input to program line output: 103 db.

(b) Any preamplifier input to monitoring amplifier output: 130 db.

(c) Any turntable, tape, projector or network input to program line output: 60 db.

(d) Any turntable, tape, projector or network input to monitoring amplifier output: 87 db.

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

RESPONSE: Program circuits ±1½ db, 30-15,000 cycles
Monitor circuits ±2 db, 30-15,000 cycles.

DISTORTION: Program circuit 1% or less 30-15,000 cycles at +8 dbm.

Monitor circuit 1% or less 50-15,000 cycles at +40 dbm or 10 watts.

NOISE: Program circuit including preamplifier 60 db or better below +8 dbm output with -60 dbm input.

Equipment noise input is -120 dbm.

Monitor circuit 62 db below +40 dbm output.

IMPEDANCES: Microphone input to preamplifiers, 30/50—150/250 ohms.

Turntable, projector, tape input to mixer, 150/250 ohms.

Remote line, network input to mixer, 100/200—500/600 ohms.

Program line output, 500/600 ohms.

Monitoring amplifier output, 8 or 16 ohms.

POWER: 115 volts, 50/60 cycles at 130 watts.

SIZE: — Console, 36" wide, 5¾" high, 12½" deep.

— Power/monitoring/muting unit, 19" wide, 7" high, 8" deep. Front panel drops down to service.

— Optional desk, 30" high, 36" wide, 25½" deep with desk (front to console) depth 12".

TUBES: Preamplifiers each (2) 5879.

Program amplifiers (3) 5879 and (1) 12AU7.

Cueing amplifier (1) 12AX7 and (1) 6AK6.

Monitor booster amplifier (1) 12AK7.

Monitoring amplifier (2) 12AX7 and (2) EL84.

Power supply, one each OA2, 5879, 6080, 5V4 (GZ34).

Total tubes (standard model with 3 preamplifiers) — 21.

Total tube types — 8.

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

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

ORDERING INFORMATION

Yard console complete with three preamplifiers, power supply/monitoring amplifier/muting relay unit and 100% set of tubes	**M-5526**
Spare 100% tube kit for M-5526 Yard	**TK-282**
Extra preamplifier with tubes	**M-5304**
Extra muting relays	**AK-12626**
Desk complete as illustrated (shipped knocked down)	**M-5528**
Speaker matching transformer	**A30601**

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GATES

THE 100% NEW "STUDIOETTE"

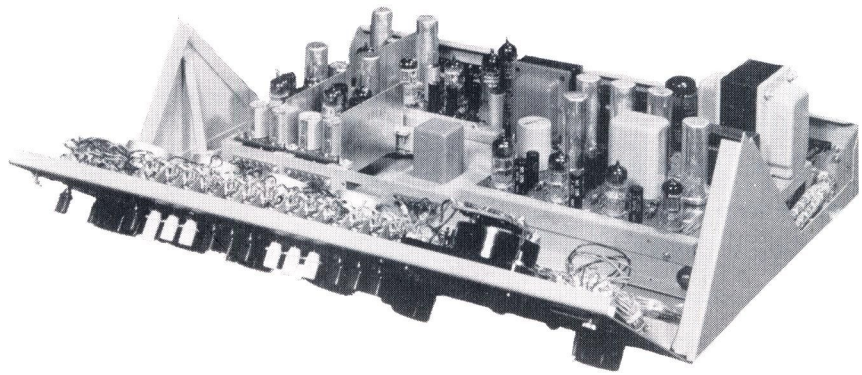


In the new Studioette speech input console, Gates engineers have indeed supplied a potpourri of features that will warrant the admiration of the most exacting engineer. Most modest of all in price in the extensive line of fine Gates speech input systems and yet switching and control functions abound in variety and completeness.

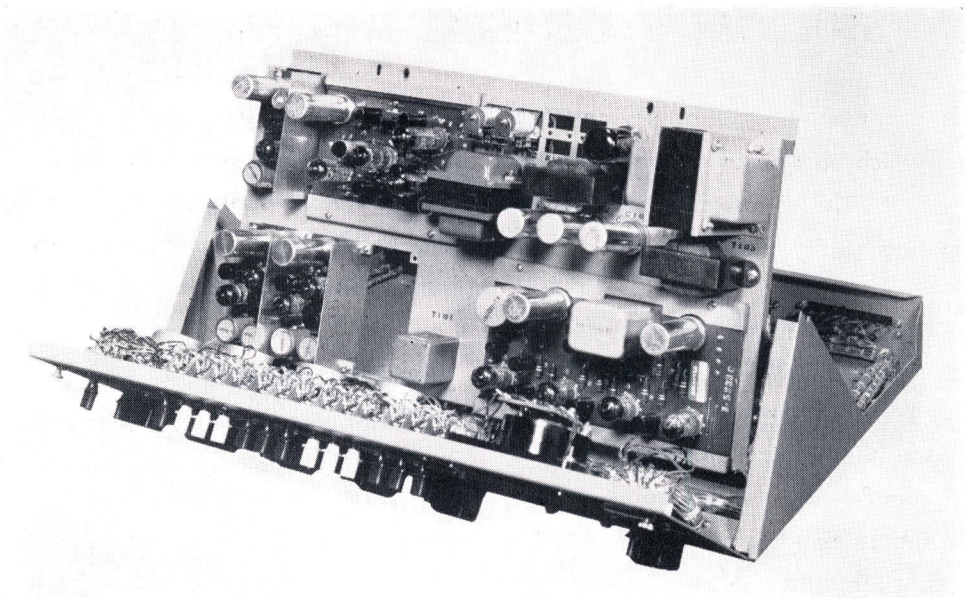
Taking full benefit of the progressiveness of printed wiring, this cost saver is converted to more inbuilt quality, greater reliability, wider versatility and a speech input console **ahead of the times** in styling, human engineering and performance standards.

Both radio and television broadcasters will find this newest Gates equipment ideally suited for main and sub-studio service. Studioette attractiveness is only excelled by the engineering thought placed in proper location of controls, extreme ease in maintenance and the generosity of facilities. The following pages tell an interesting story of a product destined for acclaim.

Without question, the Gates "Studioette" is the easiest to service speech input system ever manufactured. As one observer put it, "This type of construction you would expect to see on a convention floor to exhibit every part. It is hard to believe it is standard construction."

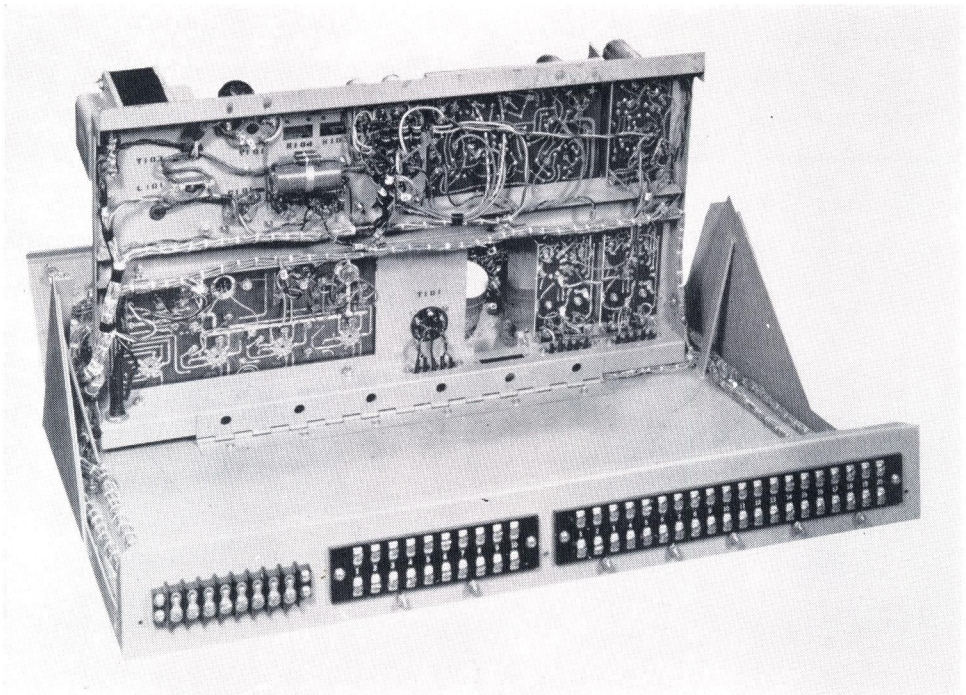


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Above, lid is complete removed. Front panel hinges out to reach every "behind the panel" component. Cleaning the step type controls or replacing the meter lamp can even be enjoyable. The amplifier deck hinges up so that muting relay contacts are at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

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



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STUDIOETTE GENERAL INFORMATION

MICROPHONES: Four microphones may be key selected into two preamplifiers which operate in conjunction with mixing channels 1 and 2. These microphones may be operated with any muting relay combination.

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

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

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

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

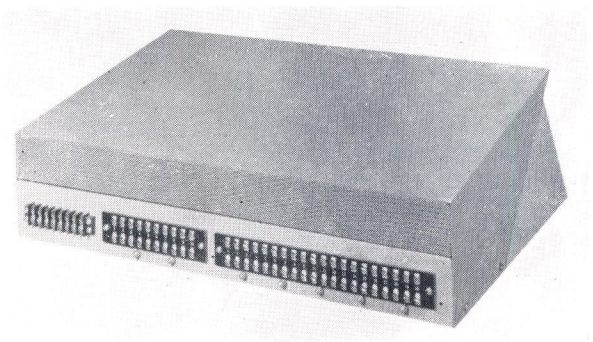
NETWORK INPUT: Key selected into mixing channel 4 or cue-override (see remote override and tape cue below).

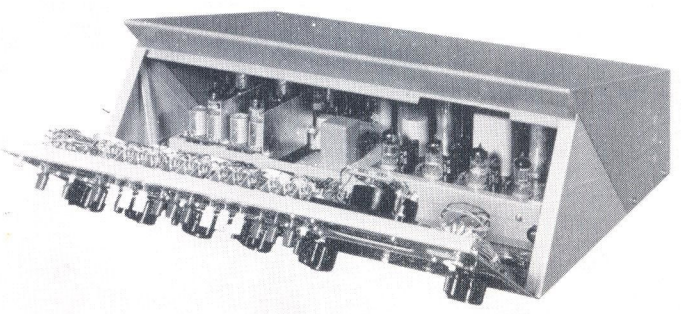
TAPE INPUTS: Two keys select two tape recorder inputs to mixing channel 4 or cue override. Tape inputs may be utilized for projector inputs where the Studioette is employed in TV.

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

UTILITY KEYS AND JACK: Three unwired utility keys and an unwired headphone jack are part of the control panel equipment. The purchaser may use these extras for any requirement peculiar to his installation. The utility head phone jack could be connected to the remote override for headphone listening on network, tape-projector and remote lines. As an example, if the third preamplifier is

(continued next page)





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STUDIOETTE GENERAL INFORMATION

UTILITY KEYS AND JACK (continued)
added, one of these keys could be used for switching this preamplifier in a wide variety of circuit combinations or these keys could be used to handle more remote lines, extra turntables, tapes or projectors.

PROGRAM AMPLIFIER has high gain, is printed wiring throughout and operates directly between the program bus of the mixer to the program line.

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

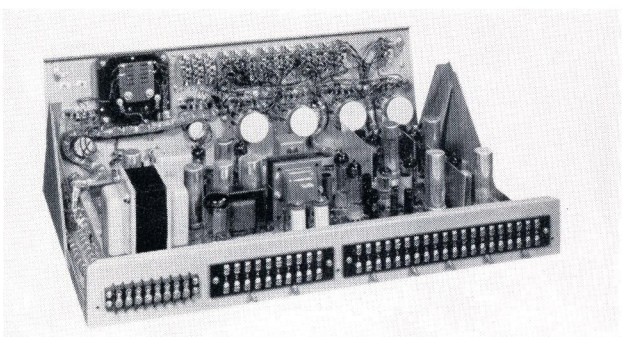
MONITOR BOOSTER: A one - stage printed wiring amplifier between the audition bus of the mixer and input to the monitoring amplifier. This feature provides balanced level between the program and audition bus so when switching the operator needs not readjust gain settings.

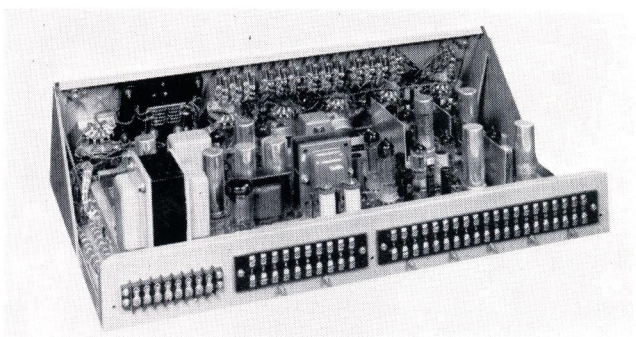
POWER SUPPLY is self-contained in the Studioette and supplies all voltages for filament, plate and relay requirements. Extra capacity is available for the optional third preamplifier and optional muting relays.

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

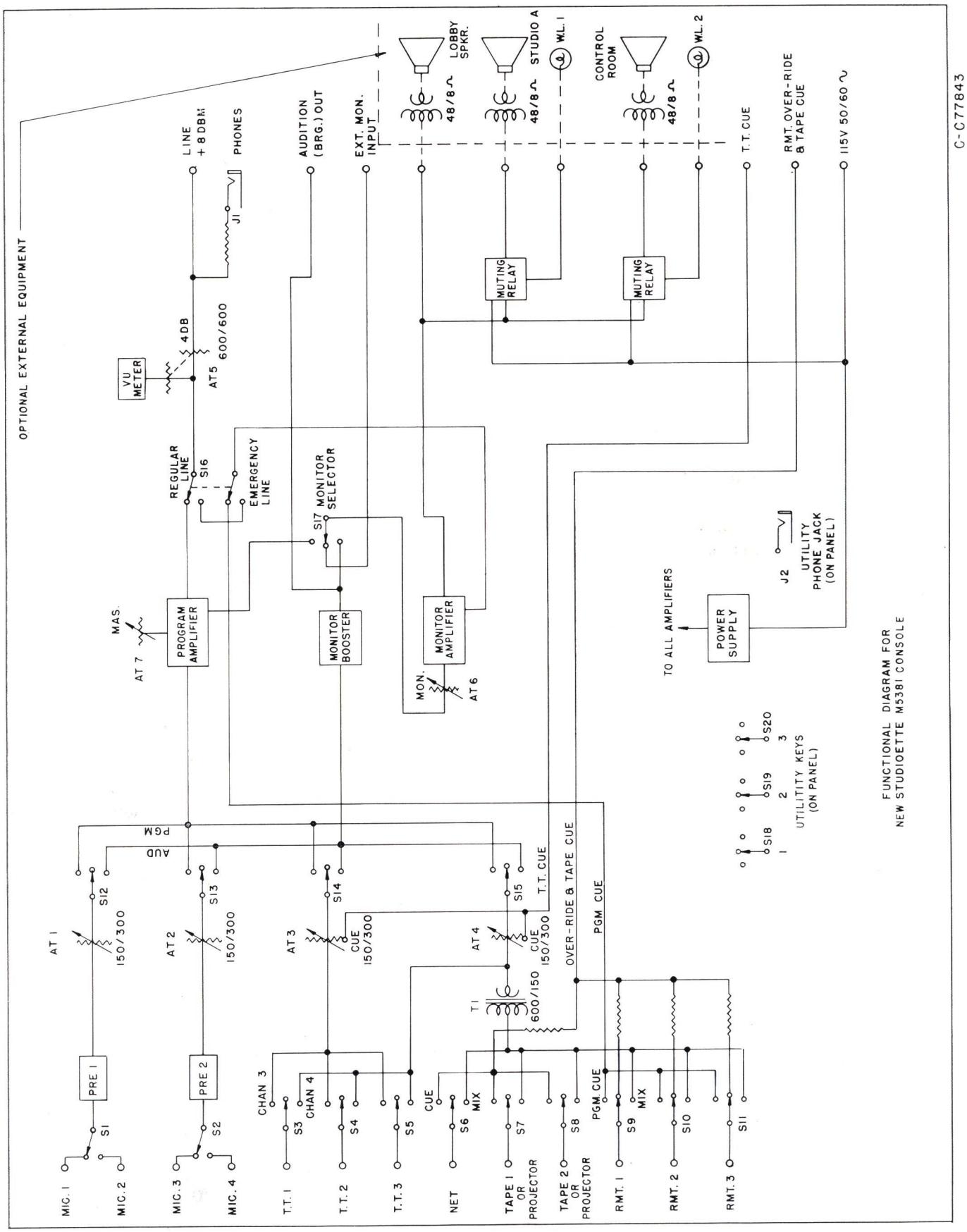
ADDITIONAL FACILITIES include an output emergency key where the program line may be switched to the monitoring amplifier output in case of a noisy tube, etc., developing in the program amplifier during a broadcast. A monitor selector key switches the monitoring amplifier input to: (1) program line for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

CONSTRUCTION: The entire internal assembly is mounted on a channel. This channel hinges from the base to reach every under chassis part. The front panel hinges to the cabinet base. Cabinet top slips into place on rails. Lift it off if the need occurs. Panel slope is 30°. Escutcheons are black anodized with letters in natural aluminum. Key knobs are in selected colors for easy circuit identification. Control knobs are supplied with a color decal insert kit which may be used for color identification of controls. A 2" projection over the panel top not only serves as modern styling but eliminates overhead lighting glare.





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STUDIOETTE SPECIFICATIONS

GAIN: (a) Any preamplifier input to program line output 103 db. ±2 db.

(b) Any preamplifier input to monitoring amplifier output 140 db. ±3 db.

(c) Any turntable, net, tape or remote line input to program line output 63 db. +2 db.

(d) Any turntable, net, tape or remote line input to monitoring amplifier output 100 db. ±3db.

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

RESPONSE: Program circuits ±1½ db, 30-15,000 cycles. Monitor (audition) circuits ±2 db, 30-15,000 cycles.

DISTORTION: Program circuits 1% or less 30-15,000 cycles at +8 dbm.

Monitor (audition) circuits 1% or less 50-15,000 cycles at +40 dbm or 10 watts.

NOISE: Program circuits including preamplifier, 60 db below +8 dbm output with −60 dbm input Equivalent noise input is −120 dbm.

Monitor (audition) circuits, 55 db below +40 dbm output.

IMPEDANCES: Input to preamplifiers, 30/50 and 150/250 ohms.

Turntable inputs, 150/250 ohms.

Tape, network, remote line inputs, 500/600 ohms.

IMPEDANCES: (continued)

Program line output, 500/600 ohms.

Monitoring amplifier output, 8 and 16 ohms.*

TUBES: Preamplifiers, each (2) 5879.

Program amplifier, (3) 5879, (1) 12AU7.

Monitor booster amplifier, (1) 12AX7.

Monitor amplifier, (2) 12AX7, (2) EL84.

Power supply, (2) OA2, (1) GZ-34.

Total tubes, 16.

Total tube types, 6.

POWER: 115 volts, 50/60 cycles at 120 watts.

SIZE: 24" wide, 8¼" highest point, 17" deep.

TERMINATIONS: Numbered screw terminals.

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

NOTE: All gain measurements are ±2 db.

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

ORDERING INFORMATION

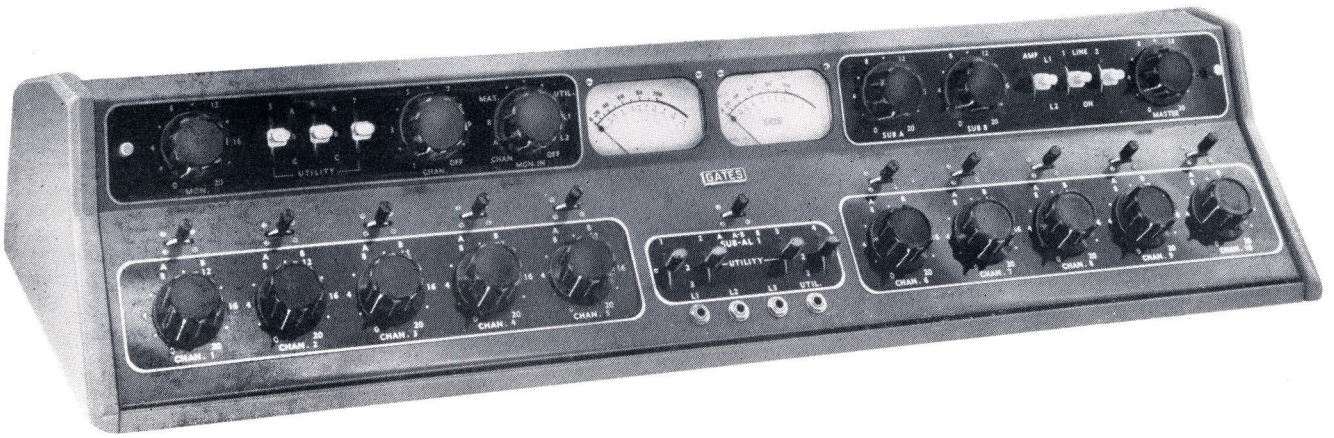
Studioette console complete with tubes, two preamplifiers and two muting relays, ready to use	**M-5381**
Spare 100% tube kit for Studioette	**TK-270**
Extra preamplifier for Studioette**	**M-5304**
Extra muting relay for Studioette	**AK-12626**
Speaker matching transformer	**A-30601**

** For illustration of preamplifiers, refer to Yard console (see Index).

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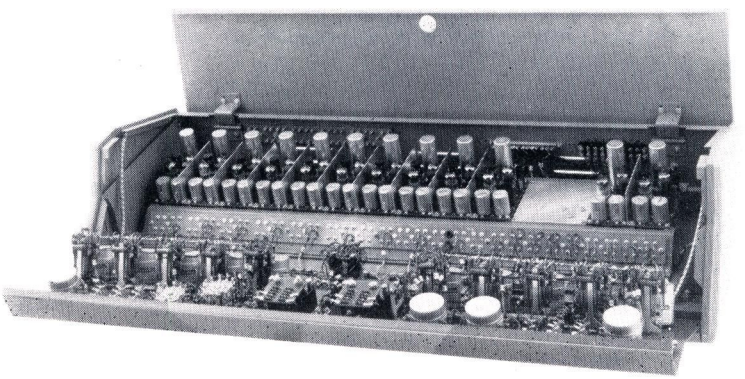
TV-10 AUDIO CONTROL CONSOLE FOR TELEVISION



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

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

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



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TV-10 OUTSTANDING FEATURES

Ten mixing channels, all with step attenuators.

Mixer keys select into choice of two program buses, each bus controlled by sub-master gain control.

Master gain selectable to either program bus or combined program buses for total fade.

10 position selector for complete preview of each of 10 mixing channels.

10 position monitor selector for monitoring: (1) program bus A, (2) program bus B, (3) combined program buses, (4) Line 1, (5) Line 2, (6) Utility Line, (7) Four utility circuits at user's discretion.

Back panel mount dual standard 4" VU meters.

Dual "plug-in" high gain program amplifiers.

Dual booster amplifiers for each program bus.

10 preamplifier capacity. 6 supplied as standard equipment.

10 watt low distortion monitoring amplifier.

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

7 unwired utility keys for use at station's discretion. Adds 21 circuits.

4 headset jacks—3 for output lines plus utility jack usually wired to intercom.

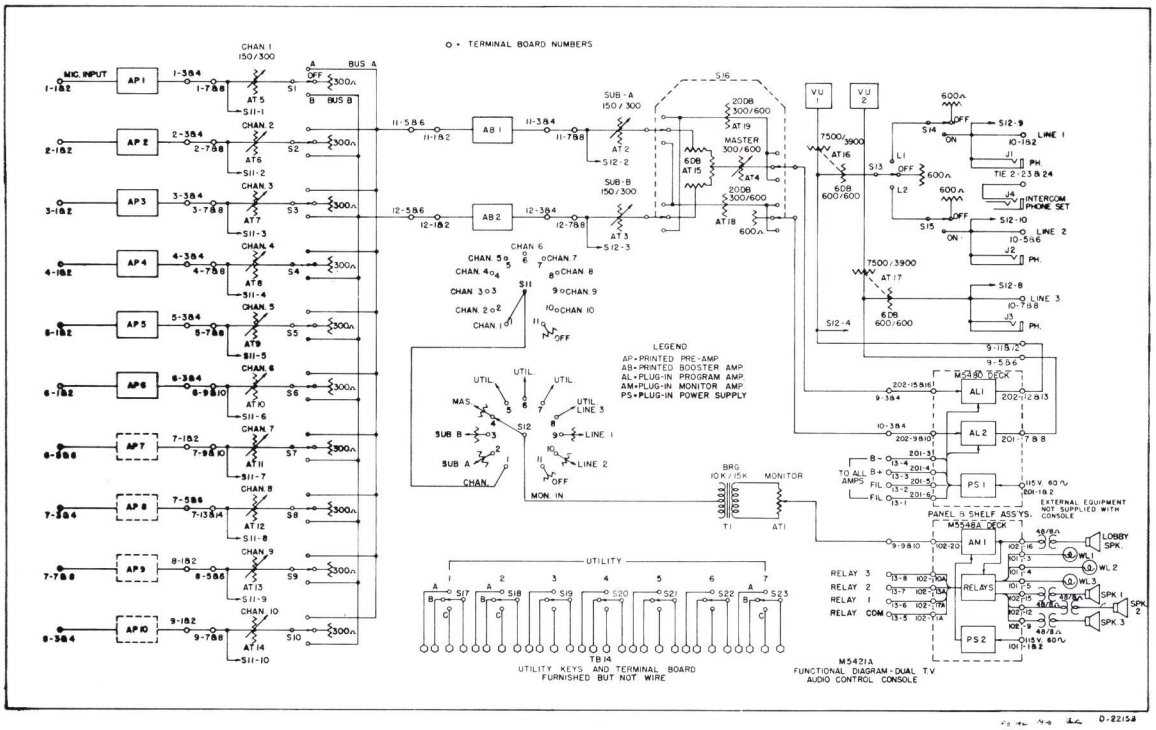
3 relays for warning light/speaker muting with knockouts for 2 more relays if needed.

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

2 step functional design. Perfect over the top vision—only 7½" high.

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

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



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TV-10 SPECIFICATIONS

SPECIFICATIONS MECHANICAL

SIZE: Console, 39" long, 7½" high (lid down), 15½" deep.

FINISH: Medium grey hand rubbed with second tone of light grey. Escutcheons anodized black. Knobs black with color disc inserts. Panel and shelf units in medium grey hand rubbed.

WEIGHTS: Console, 50 lbs. Panel and shelf units with equipment, 80 lbs. Packed weight, 260 lbs. Cubage 16.

POWER: 105/125 volts, 50/60 cycles, 150 watts input with 6 preamplifiers, 170 watts input with 10 preamplifiers.

SPECIFICATIONS ELECTRICAL

Microphone input to program line output (all channels):

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

High level channels (less preamplifiers):

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

Monitoring amplifier:

GAIN: Provides maximum output with normal levels and control positions.
RESPONSE: +2 db 50-15,000 cycles.
DISTORTION: 1.5% or less 50-15,000 cycles at normal speaker levels, 3% or less at +38 dbm output (8 watts).
NOISE: 60 db +5 db below +30 dbm output at normal control settings.
CROSS-TALK: None.*

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

OTHER SPECIFICATIONS

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

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

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

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

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

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

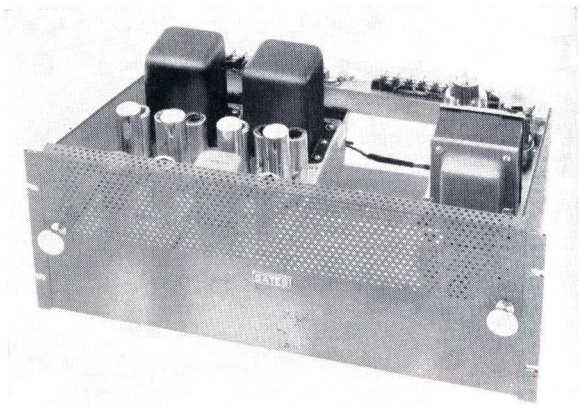
Total tubes: (22) 5879, (7) 12AU7, (2) 6AQ5, (2) 5V4G, (2) 6080 and (4) OA2.

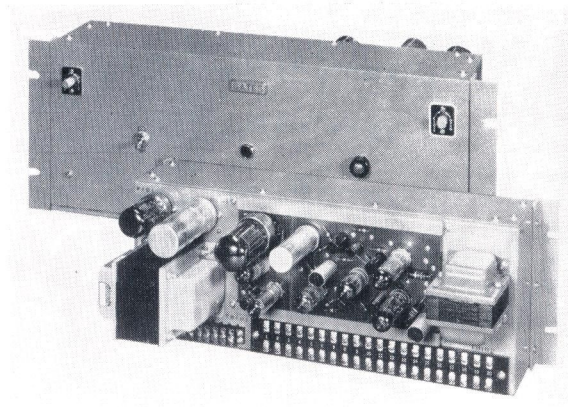
ORDERING INFORMATION

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

Extra preamplifiers with tubes M-5304

Spare tube complement for TV-10 Console TK-295





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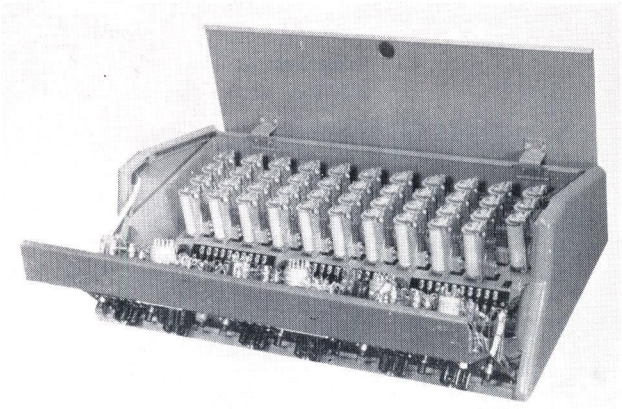
MASTER PRESET CONTROL CONSOLE



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

The preset unit, illustrated herein, is based around a parallel preset relay system. Divided into three sections, ten relays in each unit are employed for program switching and are preset from the front panel. These relays are then controlled by a master relay. A double light bank indicates the preset circuit. Red is "On Air". Green is "Preset". The lever key locks up to "Master" and is non-locking down to "Operate".

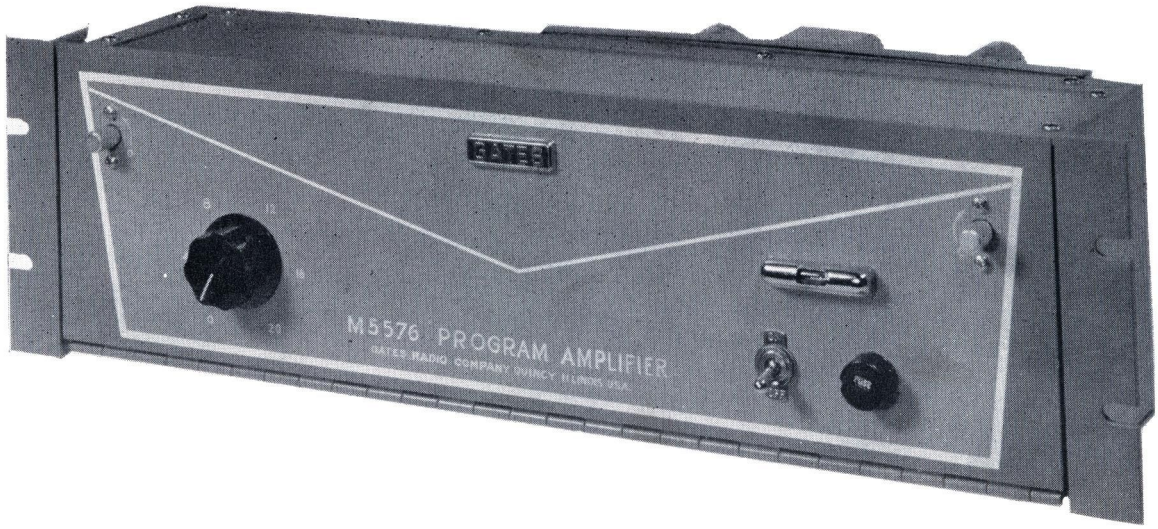
It will be noted that though complete in every detail, the space requirements are held to a minimum as can be observed by comparing the 4" VU meter size to the total width and height. Prices on Preset equipment will be gladly supplied in accordance with station needs.



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GATES

PROGRAM OR LINE AMPLIFIER



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

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

Terminations on the rear are convenient to good rack wiring practice and are to screw type terminals with AC terminated to a barrier type terminal board. The rear illustration below shows the hum balance control to the left of the power supply transformer, necessary in precise broadcasting. — Feature of the M-5576 amplifier is the sterling performance, extremely firm specifications and durability.

SPECIFICATIONS

GAIN: 75 db ±2 db.

DISTORTION:
0.5% or less 50-15,000 cycles at +12 dbm output.
0.75% or less 30-15,000 cycles at +12 dbm output.
1% or less 50-15,000 cycles at +22 dbm output.

RESPONSE: ±1.5 db, 30 to 15,000 cycles.

NOISE: 60 db or better below —60 dbm input at +12 dbm output or equivalent to —120 dbm relative input noise.

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

TUBES: (3) 5879, (1) 12AU7 and (1) 6X4 rectifier.

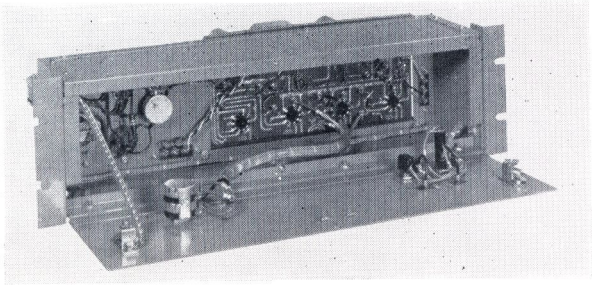
POWER: 105/125 volts, 50/60 cycles, 15 watts.

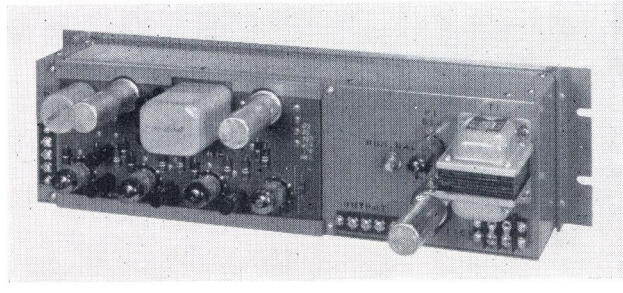
SIZE: 19" wide, 5¼" high, 7½" deep.

WEIGHT: Net 12 lbs. Packed 27 lbs. Cubage 2.

ORDERING INFORMATION

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

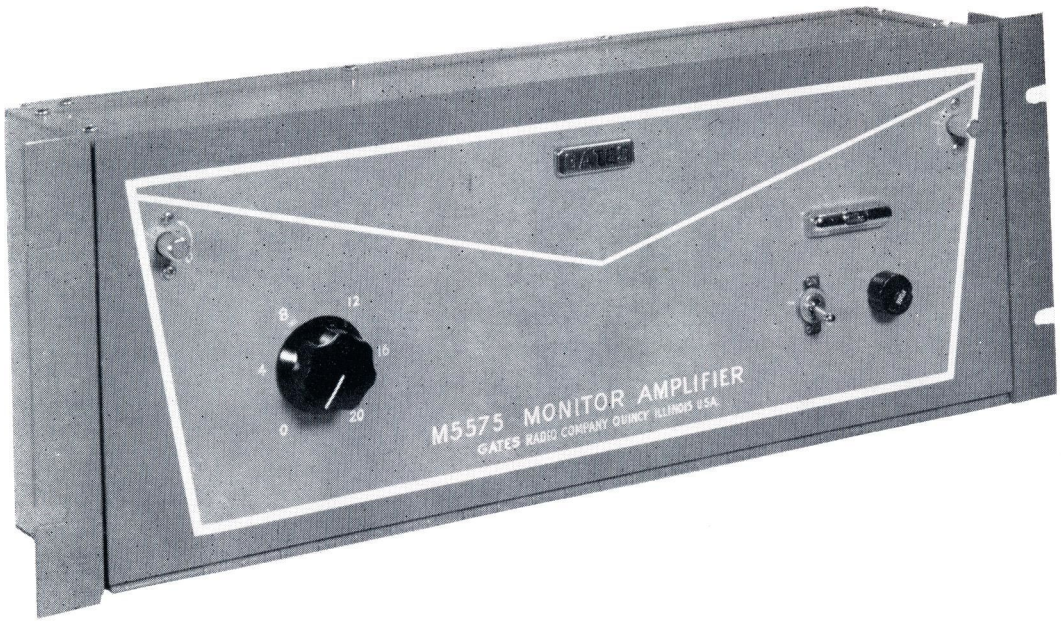




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GATES

ULTRA LINEAR MONITORING AMPLIFIER



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

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

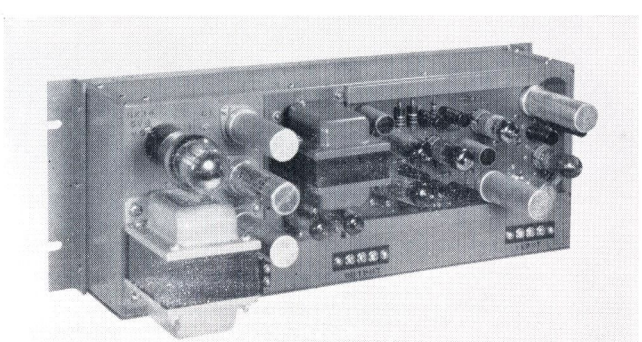
Actually two amplifiers comprise the total unit. A one-stage monitor booster amplifier operates ahead of the three-stage monitoring amplifier, with the gain control between the two amplifiers. The ultra linear output circuit and dual EL84 tubes, driven by a floating paraphase phase inverter where audio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

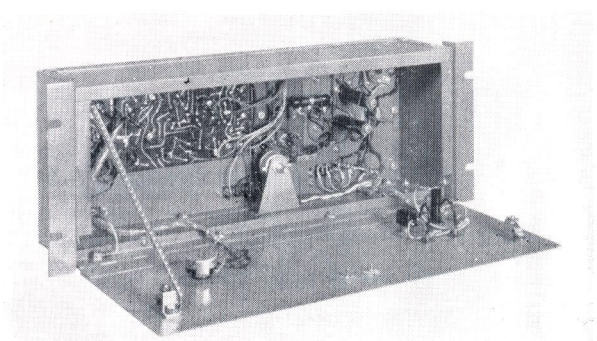
Lower illustrations amplify the miracle of printed wiring in the accomplishment of clean, no parts stacking design and the reliable lifetime uniformity of no wiring insulation to dry out and chafe. The front panel drops down to reach all under-chassis parts. Panel equipment includes gain control, AC switch, pilot light and fuse. Terminations are to screw type terminals with AC to an approved barrier strip. Hum balance control is reached by dropping down the front panel.

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

SPECIFICATIONS

GAIN: Maximum, 100 db ±2 db. Bridging, 50 db ±2 db.
DISTORTION: 1% or less 50-15,000 cycles at +40 dbm output (10 watts).
RESPONSE: ±1½ db, 30-15,000 cycles.
NOISE: 60 db or better below +40 dbm measured at −50 dbm input.
IMPEDANCES: Input 30/50 or 150/250 at full gain of 100 db. 30,000 ohms at gain of 50 db.
Output 8 or 16 ohms (see matching transformer below).
TUBES: (3) 12AX7, (2) EL84, (1) GZ34 or 5V4, (1) OA2, (1) OB2.
POWER: 105/125 volts, 50/60 cycles, 85 watts.
SIZE: 19" wide, 7" high, 8" deep.
WEIGHT: Net, 18 lbs. Packed, 34 lbs. Cubage 2½.
SPEAKER MATCHING TRANSFORMER: Optional accessory where many speakers are employed. Primary 48 ohms. Secondary 8 ohms. Permits loading as many as 8 speakers to output of amplifier. Transformer is installed with speaker. **(Cat. A-30601)**





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GATES

THE "UNI-QUE" --- A NEW CUEING AMPLIFIER



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

"UniQue" is a correctly designed amplifier with self-contained loudspeaker and its own silicon rectified power supply with such high intelligibility that voice or music is easily heard over the level of a bass reflex monitoring speaker operating at even higher level. Either low impedance or bridging input balanced and isolated requires no additional coupling transformers. The high gain permits cueing directly from turntable or microphone channels and a gain control is front panel mounted for exact adjustment.

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

SPECIFICATIONS

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

POWER: 105/125 volts, 50/60 cycles, 23 watts.*
TUBES: 12AX7, 50C5 and M-500 silicon rectifier.
SIZE: Desk type: 12⅛" wide, 3" high, 7⅜" deep.
Rack type: 19" wide, 3½" high, 6½" deep.**
FINISH: Medium gloss gray, lettering in white.
WEIGHT: Net 10 lbs. Packed 16 lbs. Cubage 1.

* Power supply is transformer isolated to power line and not AC/DC.
** Rack model is supplied with 11-position input switch.

ORDERING INFORMATION

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



New Gates cueing amplifier for desk mounting. Only 3" high, 12" wide and 7½" deep, the "UniQue" consumes negligible space. Where space is very limited mounting may be on the side of a desk, attached to a turntable cabinet or any convenient location.

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GATES

NEW SA-39B PEAK LIMITING AMPLIFIER



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

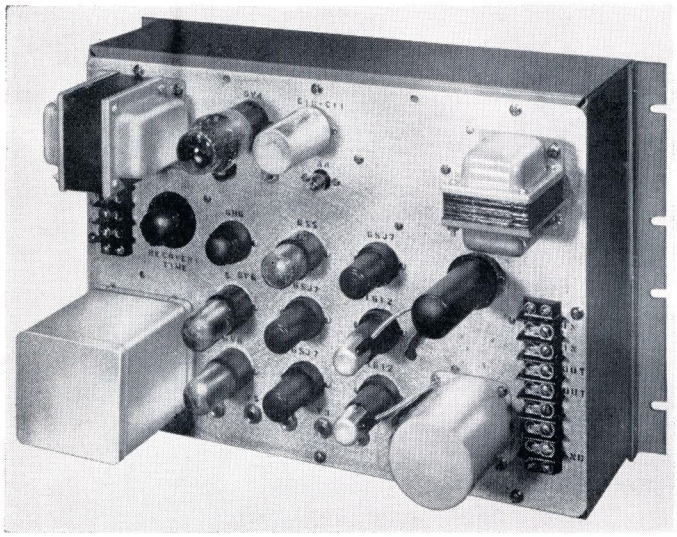
This unusual limiter circuit was originally designed in cooperation with British Broadcasting Company engineers. Elaborations on the design have been made as the art progressed. Today's model is often considered the standard of comparison both as to smooth, fast limiting performance and very low distortion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

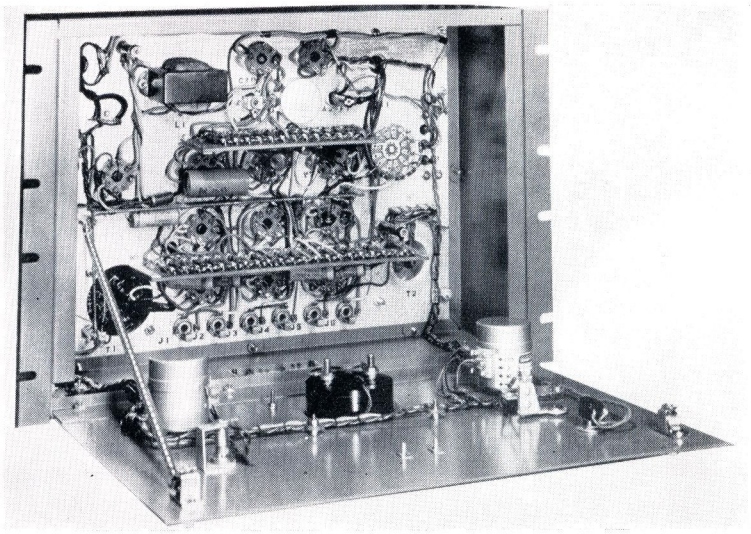
Very fast attack time, essentially instantaneous, is associated with six switch selectable release times. In this manner the engineer may adopt the mode of operation best suited for him. Limiting action is by full wave rectification of the output voltage with the resultant negative direct current fed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

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GATES

SA-39B LIMITING AMPLIFIER





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

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

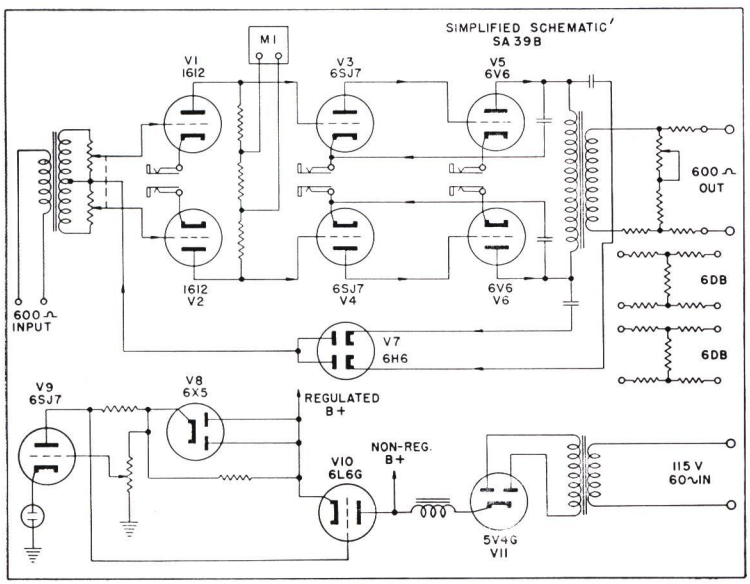
SPECIFICATIONS

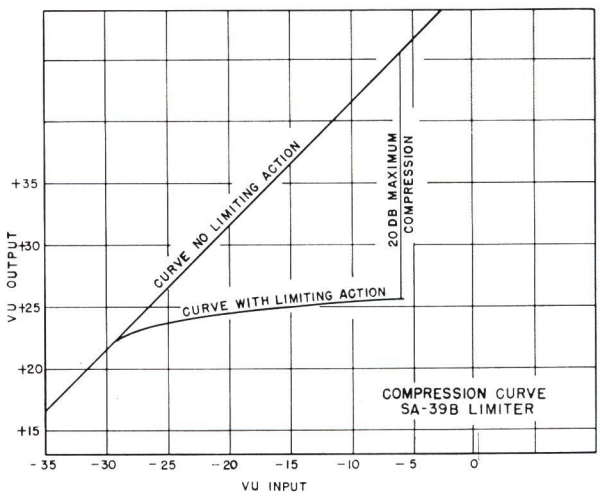
IMPEDANCES: 500/600 ohms input and output.
INPUT LEVEL: −20 to +20 db (adjustable by attenuator).
OUTPUT LEVEL: +25 dbm or less (adjustable by attenuator).
MAXIMUM GAIN: 55 db.
AUDIO RESPONSE: 30-15,000 cycles ±1½ db.
AUDIO DISTORTION: 1½ % or less 30-15,000 cycles at 20 db compression.
NOISE: 70 db or better below any adjustable output level.
ATTACK TIME: Essentially instant.
RELEASE TIME: Six positions from 0.2 to 1.2 seconds.
SIZE: 19" wide, 14" high, 9½" deep.
FINISH: Medium gloss gray.
DC REGULATION: ±5 volts of main plate supply.
POWER INPUT: 115 volts, 50/60 cycles, 90 watts.
TUBES: (2) 1612, (2) 6V6GT, (3) 6SJ7, and one each 6H6, 6S5GT, 6Y6G and 5V4G.
WEIGHTS: Net 36 lbs. Domestic packed 74 lbs. Export packed 96 lbs. Cubage 9½"

●

ORDERING INFORMATION

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





If You Didn't Get This From My Site,
Then It Was Stolen From...
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GATES

"STA-LEVEL" AUTOMATIC PROGRAM LEVEL AMPLIFIER



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

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

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

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

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

(4) Here is a use many are finding for "Sta-Level". In disc jockey shows, by setting the microphone level higher than music level an automatic fade of music during the voice transmission is possible and excellently done. For example, if the microphone fader on the speech equipment is set 15 db above the turntable fader, when using the microphone, the music will fade 15 db. Music will return to normal level when microphone is no longer used. Recovery time is smooth, quite like a normal up fade.

GENERAL INFORMATION

RECOVERY SPEED: As supplied, "Sta-Level" recovers ⅔ level in 7 seconds and 90% level in about 28 seconds. This is considered typical. However, a kit of small fixed resistors is supplied. If the operator feels this is too slow or too fast, he may, by changing two resistors, increase recovery to as fast as 2¼ seconds for ⅔ level and 10 seconds for 90% level, or as slow as 11¼ seconds for ⅔ level and 45 seconds for 90% level.

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

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

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GATES

"STA-LEVEL" SPECIFICATIONS

POWER SUPPLY: Regulated type, self-contained.

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

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

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

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

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

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

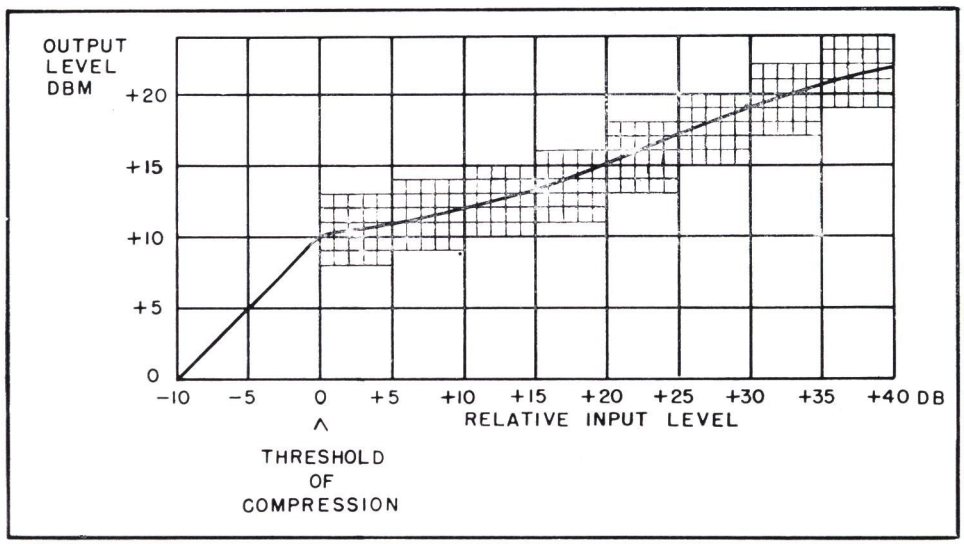
GAIN: 62 db ±2 db.

IMPEDANCES: 600 ohms input and output.

SIZE AND CONSTRUCTION: 19" x 5¼" panel. 7" deep. Front panel drops down to service all internal parts.

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

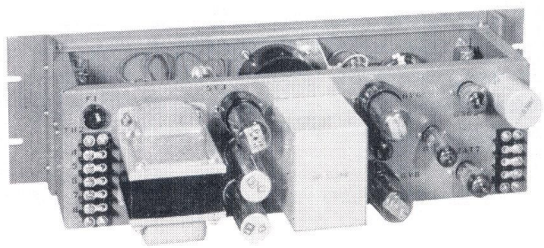
FINISH: Medium gloss gray with lettering in white.



ORDERING INFORMATION

"Sta-Level" complete with tubes and ready to operate **M-5167**

Spare 100% tube kit for above **TK-243**

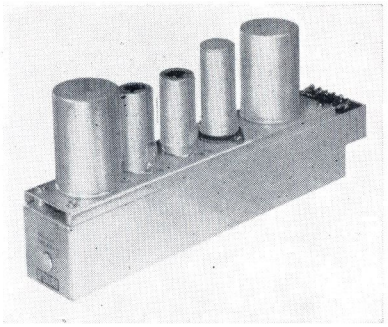


Front panel drops down for complete inner servicing. Big advantage of this type of construction is ability to keep important inner workings clean by means of bellows or small suction type cleaner.

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GATES

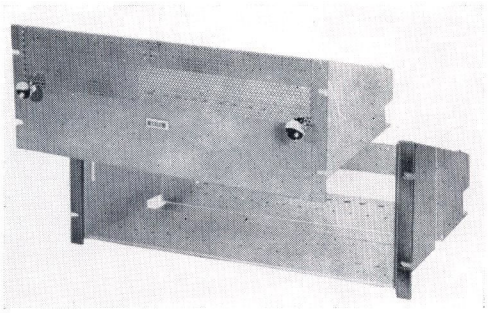
PLUG-IN PREAMPLIFIER



PRE-4 PREAMPLIFIER

GAIN: 40 db ±1 db.
DISTORTION: 0.5% or less 50-15,000. 0.75% or less at 30 cycles. Measured at +8 dbm output.
NOISE: 90 db below +10 dbm output (—120 to —124 dbm equivalent input noise).
LEVELS: Maximum input —32 dbm. Maximum output at above rated distortion, +8 dbm.
IMPEDANCES: Input 150 and 250 ohms. Output 150 and 600 ohms. As input transformer is unloaded, the impedance is substantially higher than source impedance over entire range.
POWER: Requires 6.3 volts AC at 0.3 amperes and 275/310 volts DC at 6 MA.
TUBES: Two type 5879.
CIRCUIT: Two-stage shunt fed output. Overall feedback from plate of second stage to cathode of first stage.
MECHANICAL: Size 2 1/16"x11½"x5 3/8" high overall. Mounts eight in one PAS-1 panel and shelf assembly. One PWR-3 power supply will operate up to 26 preamplifiers.

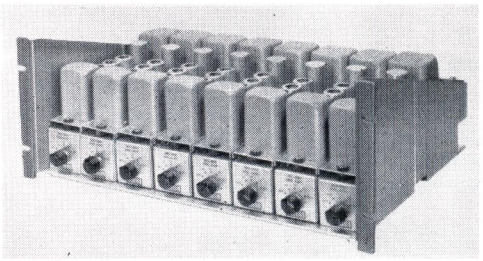
Preamplifier with Tubes PRE-4
100% Spare Tube Complement . TK-112
Base and Receptacle BA-20



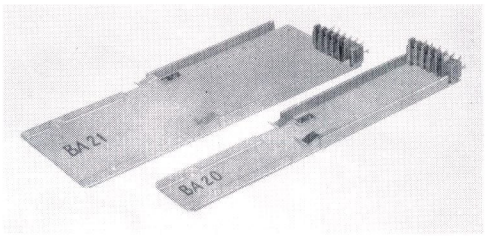
PANEL AND SHELF ASSEMBLY

Used for rack or multiple mounting of plug-in units. Requires only 7"x19" rack space. Front is ventilated by top half being perforated and is instantly removable to allow removing amplifiers from the front, or making gain adjustments. The BA-20 or BA-21 bases with receptacle, listed below, fasten to the bottom of the panel and shelf assembly. Depth is 13 3/8". Finish medium gloss gray.

Panel and Shelf PAS-1



Here are 8 plug-in preamplifiers mounted on one PAS-1 panel and shelf assembly, requiring only 7"x19" of rack space. Self-aligning plugs and receptacles allow unlimited interchange of amplifiers without resetting plugs or receptacles.

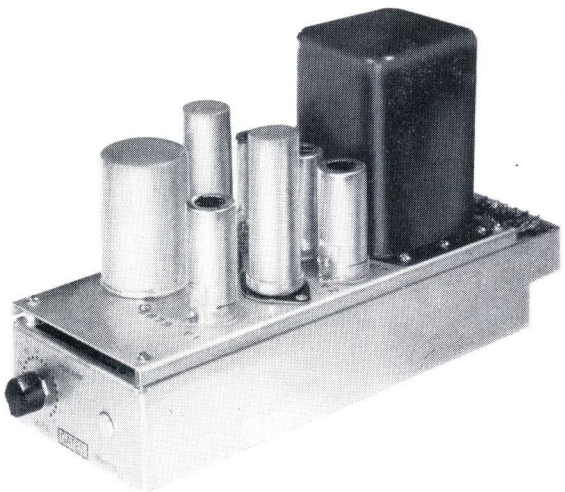


BASE AND RECEPTACLE

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

Base and Receptacle BA-20
BA-21

PLUG-IN PROGRAM AMPLIFIER — BRIDGING CONTROLS



PGM-4 PROGRAM AMPLIFIER

USE: As high quality program or line amplifier where output up to +24 dbm at low distortion is desired. One or two of these amplifiers will operate from a single PWR-3 regulated power supply listed on next page.
GAIN: 65 db as a line or program amplifier, direct matching of impedances. Where used as a bridging amplifier with AT2 bridging volume control, the gain is 33 db.
RESPONSE: ±1 db 30-15,000 cycles.
DISTORTION: 0.5% 50-15,000 cycles. 0.75% or less at 30 cycles, at +24 dbm output.
NOISE: 79 db or better below +24 dbm output with volume control fully open. (—120 to —124 equivalent input noise).
LEVELS: Maximum input +8 dbm. Maximum output +24 dbm.
IMPEDANCES: Input 150 and 600 ohms. Output 600, 150 ohms.
POWER: 6.3 volts AC at 1.05A and 300/330 volts DC at 37 MA.
TUBES: Three 12AU7 and one 5879.
CIRCUIT: Three stages with push-pull output. Feedback between second and third stages.
MECHANICAL: Cold rolled steel chassis, die formed and heavily plated. Size: 4 1/8" x 11½" x 6 5/8" high overall. Type PWR-3 power supply will operate from one to four of these program amplifiers.

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

BRIDGING CONTROLS

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

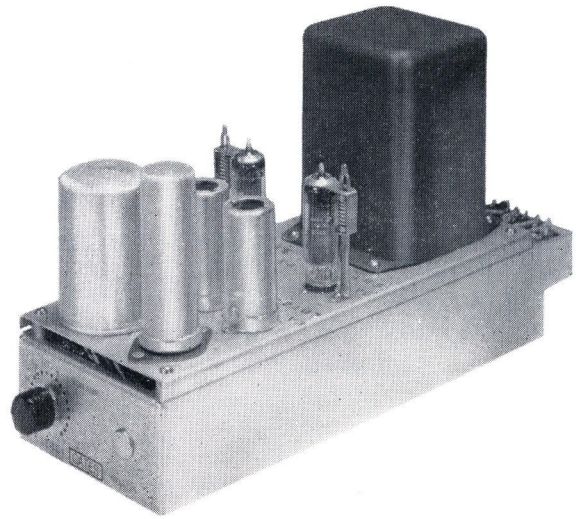
AT1 Control, 10,000 ohms to 150 ohms
AT2 Control, 10,000 ohms to 600 ohms
AT3 Control, 20,000 ohms to 150 ohms
AT4 Control, 20,000 ohms to 600 ohms

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PLUG-IN MONITORING AMPLIFIER

MON-4 MONITORING AMPLIFIER



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

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

RESPONSE: ±2 db 30-15,000 cycles.

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

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

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

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

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

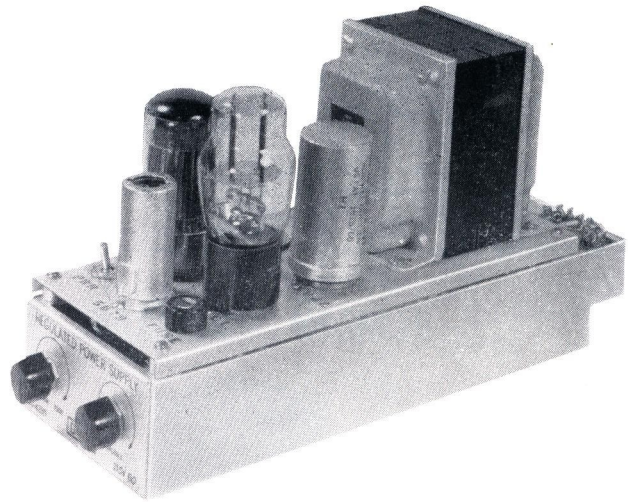
CIRCUIT: Four-stage with push-pull output. Tertiary winding feedback from secondary of output transformer to cathode of driver stage.

MECHANICAL: Cold rolled steel chassis, die formed and heavily plated. Size: 4 1/8" x 11½" x 6 5/8" high overall. One PWR-3 power supply, with one PWR-10 bias supply, will operate one or two of these monitoring amplifiers.

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

PLUG-IN MONITORING AMPLIFIER — POWER SUPPLY

PWR-3 REGULATED POWER SUPPLY



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

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

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

INTERNAL IMPEDANCE: Negligible.

INTERNAL REACTANCE: Negligible.

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

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

MECHANICAL: Cold rolled steel chassis, die formed and plated. Hum balance control on filament circuit and voltage output control on front. Size: 4 1/8" wide, 11½" front to back, 6 3/8" high. Mounts four in a panel and shelf assembly.

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



PWR-10 BIAS SUPPLY

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

Bias supply	**PWR-10**

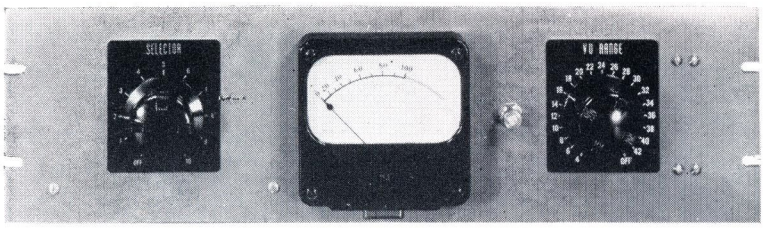
When Ordering Plug-In Equipment

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

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GATES

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



V-22 VOLUME INDICATOR

A complete range set with 10 position input selector switch. In this way, all circuits to be measured may be switched in, including proof of performance. Meter is 4" illuminated. Range control in 2 VU steps from +4 to +40 VU. Input impedance 7500 ohms to bridge at 500/600 ohm line. Panel 5¼" x 19". Finish, medium gloss gray.

SWITCH AND FUSE PANEL

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

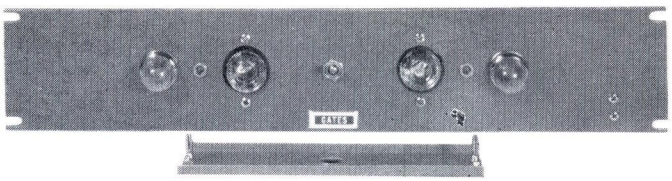
Includes indicator lamps and 15A switch.

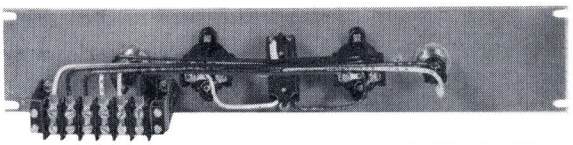
Size: 3½" x 19".

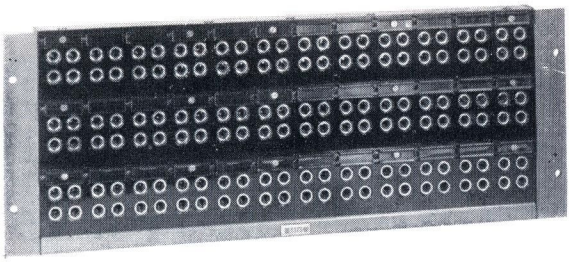
Finish, medium gray.

Switch Panel M-4242

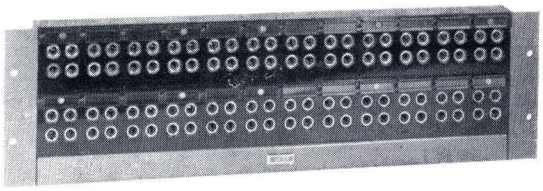




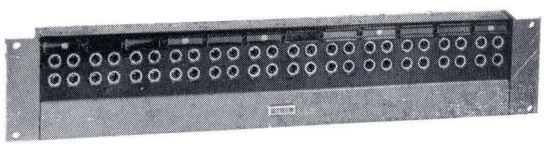




Above, three C-1500 jack panels mounted on PD3 jack mat. Has 144 jacks (72 pairs). Panel size: 7"x19".



Above, two C-1500 jack panels mounted on PD2 jack mat. Has 96 jacks (48 pairs). Panel size: 5¼"x19".



Above, one C-1500 jack panel mounted on PD1 jack mat. Has 48 jacks (24 pairs). Panel size: 3½"x19".

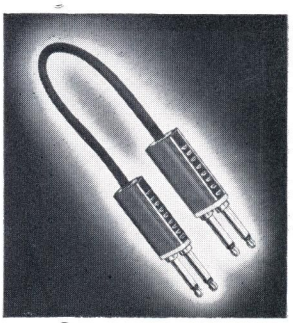


Above, C-150 jack panel has 24 jacks (12 pairs). Size: 1¾"x19". Does not require jack mat. End brackets for rack mounting supplied.

PATCH PANELS

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

Jack strip (24 jacks) with mounting brackets	C-150
Jack strip (48 jacks) less mat	C-1500
Jack mat for one C-1500 jack strip	PD1
Jack mat for two C-1500 jack strips	PD2
Jack mat for three C-1500 jack strips	PD3
Patch cord 2' long	PJ12
Patch cord 3' long	PJ13
Patch cord 4' long	PJ14
Patch cord 5' long	PJ15



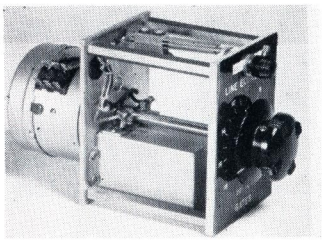
Patch cords available in four lengths. Double plugs each end. Shielded and covered with durable black braid plus extra reinforcement 6" from each end.

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GATES

AUDIO EQUALIZERS—SOUND EFFECTS FILTERS

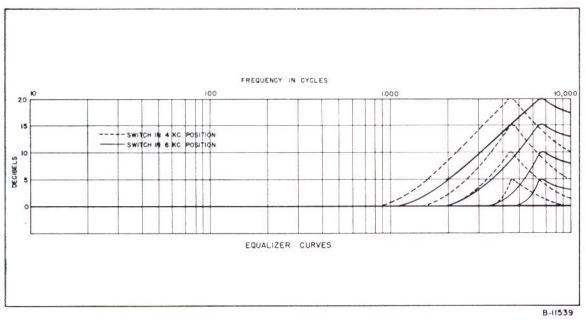




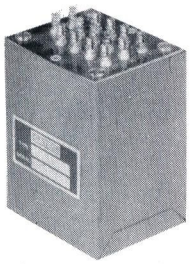
A precision equalizer available in 5 ranges as listed below. Has twenty 1 db steps. Consists of a high Q coil capacity tuned. Dual frequency units have selector key for each frequency. Dial indicates equalization in decibel variance from 1000 cycles. Several equalizers may operate in parallel without affecting the other. For operation across a 500/600 ohm circuit. Dial in black anodized. Easily panel mounted. Curve below is that of SA-118 for 4000 and 6000 cycle.

EQUALIZER FREQUENCY

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



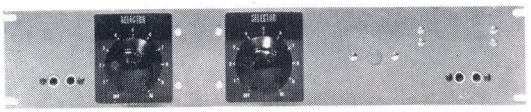
FIXED AND VARIABLE EQUALIZERS



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

SIZE: 2½" x 2½" x 3". Ideal for equalizing telephone lines or any circuit requiring correction.

Fixed equalizer **LE-1**



LE-2 VARIABLE EQUALIZER

Illustrated above, consists of the LE-1 equalizer with two variable controls, inserting the resistance in 1 ohm steps up to 111 ohms as required for full equalization. A double jack input is provided for direct parallel patching. Provision is also made for mounting a variable attenuator, sometimes desired in controlling line level. Panel Size: 19" x 3½". Finish, medium gray.

Variable equalizer **LE-2**

SOUND EFFECTS EQUALIZERS



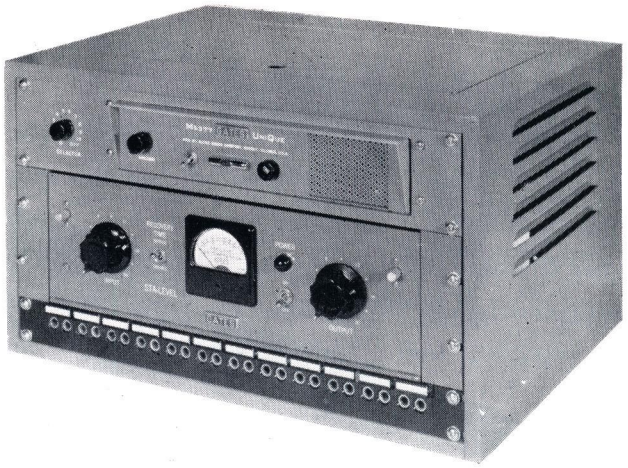
Ultimate in sound filters. Features wide frequency spectrum with overlapping cut-off frequencies, zero phase distortion, clickless steps of control, inductances toroidally wound and complete shielding for absence of hum pickup. Input level −70 to +28 dbm. Insertion loss, zero. Circuit constant, K. Available in two types: (a) low frequency cut-off, 10 positions of 70, 100, 150, 250, 500, 1000, 2000, 3000, 5000 and 7500 cycles, (b) high frequency cut-off, 10 positions of 300, 500, 1000, 2000, 3000, 5000, 6000, 7000, 8000 and 10,000 cycles. Provided with dial. Panel mounting. Size: 3¼" x 3¼" x 5" deep.

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

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CUE—STA-LEVEL PATCH CABINET

Here are the three most used control room accessories packaged in a neat cabinet for wall or desk mounting. Top unit is the Gates Uni-Que cueing amplifier with inbuilt loudspeaker and 10-position input switch as described on Page 122. — Center unit is the famous "Sta-Level" to provide constant program level to the transmitter line and listed on Page 125. — The C-150 double panel, Page 129, will accommodate those extra circuits that are part of every broadcasting operation. — Cabinet size: 20½" wide, 11¾" high and 15" deep. Finish is in medium gloss gray.



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



STUDIO WARNING LIGHTS

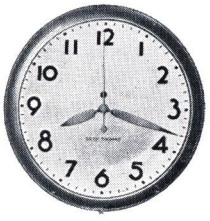
An attractive and modern design light available in many different wordings. Lettering is on plexiglass and illumination is edgewise, illuminating letters only. Size: 18" wide, 6½" from top of glass to base of lamp enclosure, 3" deep.

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

* 12 or less letters or numbers.



Sessions



Seth Thomas

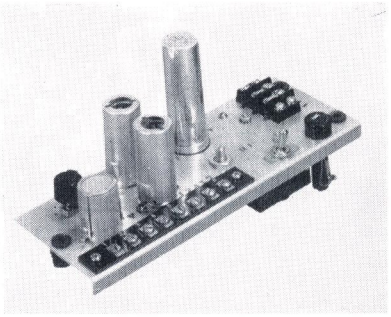
STUDIO CLOCKS

SESSIONS clock has large sweep second hand and bold black numerals on a white dial. Size: 13½" diameter. Very accurate and time set is at bottom front. Finish gray, non-glaring. 115 volts, 60 cycles.

Sessions Electric Clock RB-89E

SETH THOMAS. Thin design, bright chrome finish, convex glass with bold black lettering and easy to see second hand. Sets from front. This clock 15" in diameter with 12½" dial and only 1¾" deep. 115 volts, 60 cycles.

Seth Thomas Electric Clock 602

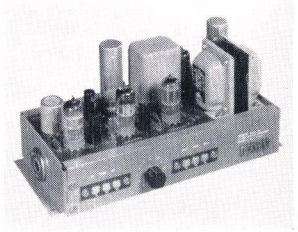


EQUALIZED PREAMPLIFIER

A complete preamplifier, 3-position equalizer and selenium power supply on one chassis 3 3/8" wide and 9" long, 3" above chassis and 2¼" below chassis. Three-position equalizer switch and dial plate (not illustrated) are also supplied. Curves are NAB, RIAA and high frequency roll off. Output level approximately —10 dbm when used with reluctance high impedance pickup cartridges listed below. Output impedance 150/250 or 500/600 ohms. Distortion 0.5% 50-15,000 cycles.

TUBES: (2) 12AX7. For 115 volts, 50/60 cycles. This amplifier used on CB-210 and CB-225 Gates transcription turntables. Over 2000 in daily broadcast service.

Equalized preamplifier with tubes, dial plate and switch M-5235
Spare 100% tube kit TK-225



PREAMPLIFIER

This high gain, 3-stage preamplifier with self-contained power supply is ideal for use with low impedance pickups such as the VR2 cartridge. Fully described on Page 157.

Preamplifier with tubes M-5530

NEW GE TYPE VR-2 PICKUP CARTRIDGES

Replaces, with improved performance, the GE RPX series. Response 20-20,000 cycles with output of 22 MV at 10 CM/Sec. Tracking pressure only 4 grams. Has replaceable clip in stylus. Fits Gray or GE arms listed in this catalog and many others. Use high impedance type with Gates M-5235 equalized amplifier and low impedance type with Gray 602C equalizer and Gates M-5530 preamplifier.

High Impedance VR-2 Triple Play (turnover cartridge)

Sapphire .001" and sapphire .003"	RG050
Diamond .001" and sapphire .003"	RG052
Diamond .001" and diamond .003"	RG053

High Impedance Single Stylus VR-2

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

Low Impedance VR-2 Triple Play (turnover cartridge)

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

Low Impedance VR-2 Single Stylus

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

Replacement Styli for VR-11

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

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

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

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

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

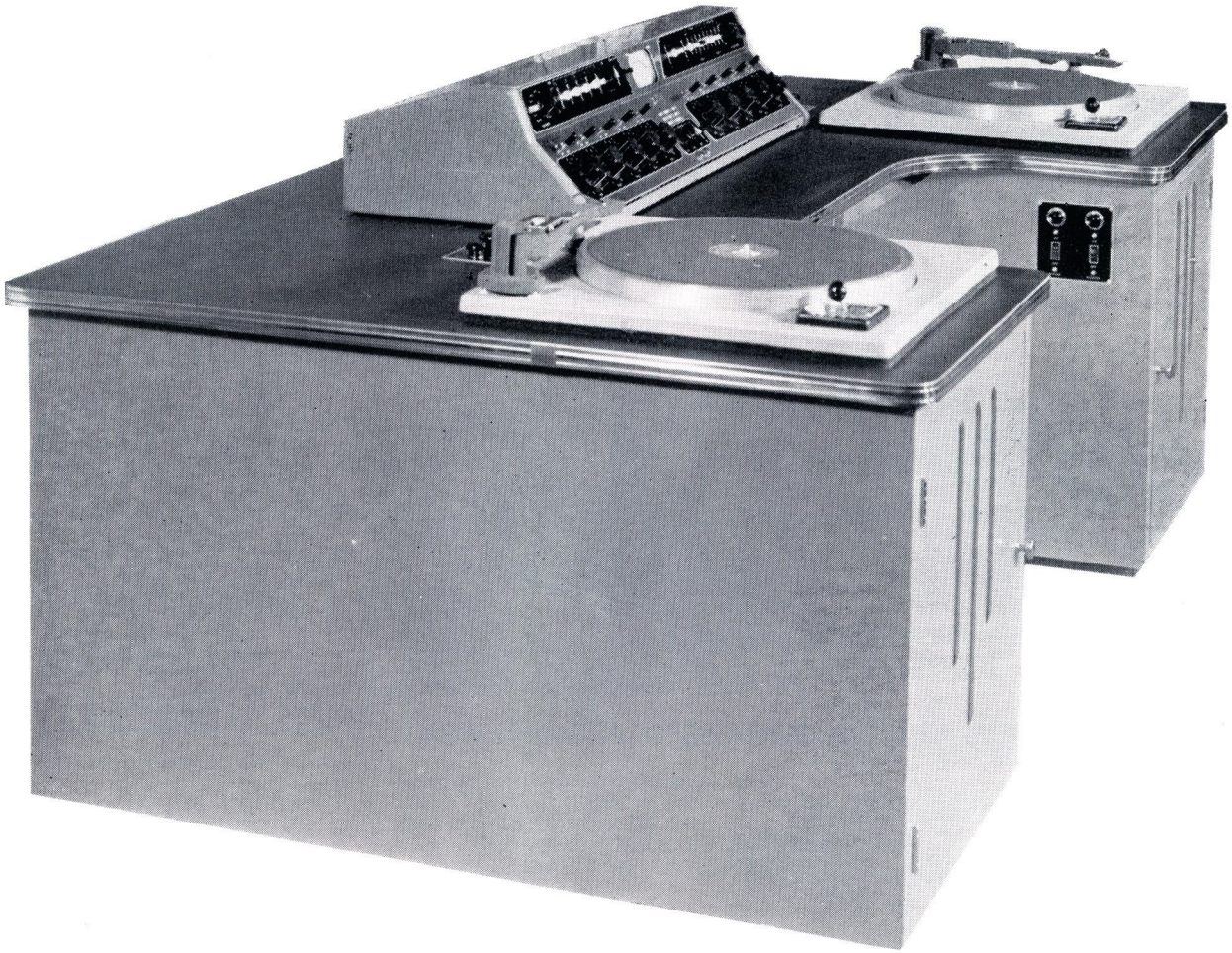
Miscellaneous

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

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GATES

CB-4 HORSESHOE DESK



The CB-4 desk is often referred to as the most beautiful speech input accessory ever designed for the broadcast industry. Even though wonderfully attractive, CB-4 is even greater in its functional usefulness. Here the turntables are on each side of the operator at the correct arm's length for relaxed operation.

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

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GATES

CB-4 DESK SPECIFICATIONS

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

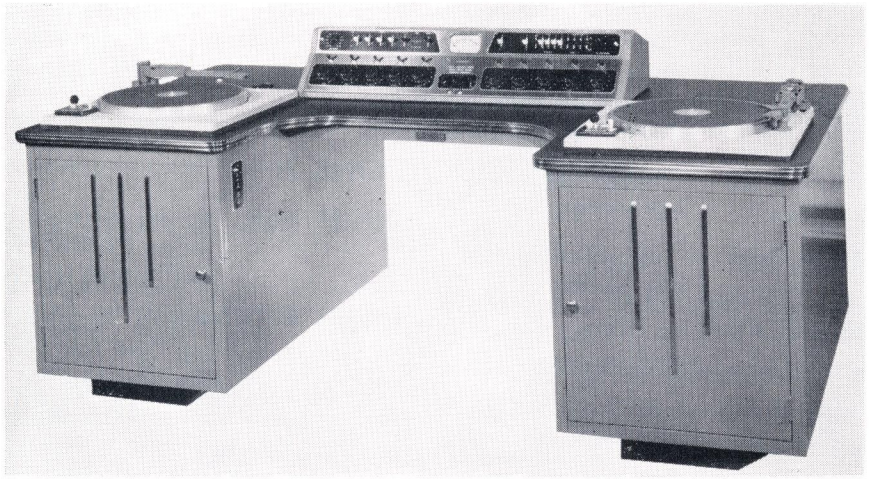
WIRED MODELS: In wired models the desk is cut out for Gates CB-100 turntables on each side. Mercury type TT motor starting switches are provided on the inside of each wing. An additional master switch is provided on the inner right wing. Wiring is terminated to the rear base, including terminals for preamplifier.

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

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

WEIGHT: Packed, 390 lbs.

CUBAGE: 120.



CB-4 DESK COMBINATION

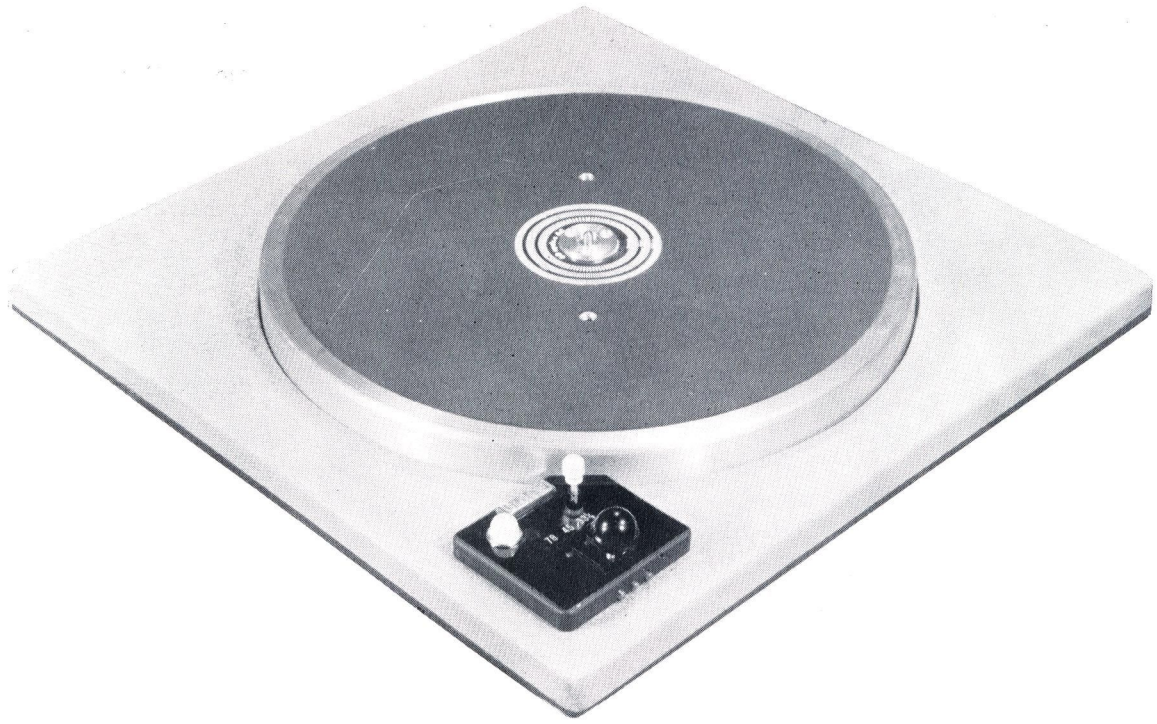
Desk only without cutouts or wiring	**CB-4**
Desk only with cutouts for CB-100 turntable, switches and wired	**CB-4M**
Desk with two CB-210A turntables wired, includes preamplifiers	**CB-4N**
Desk with CB-100 turntables, Gray 106-SP arms, Gray 602C equalizer, dual cartridge, 1 mil. and 2½ mil. diamond stylus, wired	**CB-4P**
Includes CB-4N listed above with Gatesway speech input console (illustrated above)	**CB-4R**
Includes CB-4P listed above with Gatesway speech input console (illustrated above)	**CB-4S**

NOTE: CB-4 desks may be used with any Gates console. Select desk combination of your choice and add console price for total selling price.

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GATES

CB-100 TRANSCRIPTION TURNTABLE



A new professional 3-speed turntable capable of unusual speed accuracy, low rumble and incorporating fingertip control of both speed change and motor starting. — Direct control of speed shifting eliminates springs, multiple drive wheels or gravity systems of speed change. Chrysler oilite bearings are used at all rotating points while Monoball self-aligning bearings are employed in the speed changing mechanism.

SPECIFICATIONS

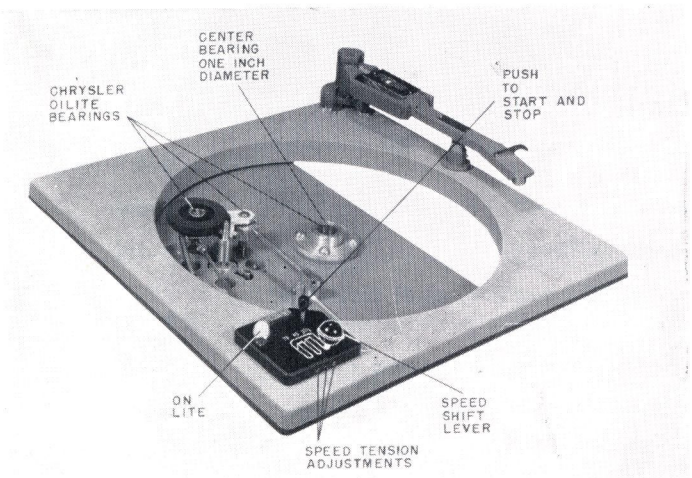
CHASSIS SIZE: 21¼"x21¼"x3".

MOTOR HANG BELOW BASE: 8".

CONSTRUCTION: Both base and platter of cast machined aluminum.

FINISH: Gray ripple enamel with tuurntable top cover of green felt.

STROBOSCOPE: Inbuilt on platter.



CENTER HUB: Spring locking type snaps up instantly for larger 45 RPM hub; locks down for standard records and transcriptions.

CENTER BEARING: 1" diameter hardened steel shaft fits into bronze Chrysler oilite bearing.

MOTOR: Synchronous, capacitor start, dynamically balanced, neoprene shock mounted 1/100 HP.

CUE ALLOWANCE: 1/6 turn at 33⅓ RPM, 1/3 turn at 45 RPM, ½ turn at 78 RPM.

NOISE: 35 db or better below average sound track.

MOTOR START: Single switch, push to start, push again to stop; neon light indicates on cycle.

IDLER WHEEL: Special shear action neoprene self-aligning with Chrysler oilite center bearing.

SPEED CHANGE: Direct single control of vertical action of drive wheel with detents.

POWER: 115 volts, 60 cycles, 45 watts.
50 cycle also available.

ORDERING INFORMATION

Transcription Turntable **CB-100**
Same as above but for 50 cycles **CB-100A**

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GATES

TRANSCRIPTION TURNTABLE CB-210



Here is a complete 3-speed commercial turntable including self-contained preamplifier, power supply, pickup arm, dual cartridge and dual styli and very modest in price. Will fit in CAB-6 cabinet, CB-4 desk, (page 132), or any suitable desk arrangement.

SPECIFICATIONS

TURNTABLES: Model CB-100, described on preceding page.

PICKUP ARM: Viscous damped for records up to 17".

PICKUP CARTRIDGE: GE, including dual 1 mil. and 2½ mil. styli, diamond or sapphire as ordered.

PREAMPLIFIER: Equalized type mounts directly to base of turntable chassis. Selenium type power supply self-contained. Distortion: ½ % 50-15,000 cycles at −10 dbm output. Output impedance: 150/600 ohms. Noise: 65 db below −20 dbm. Gain and hum balancing controls self-contained. Tubes: (2) 12AX7. Equalizer switch provides 3 curves: (1) NARTB, (2) RIAA* and (3) high frequency roll off for worn records. For 115 volts, 60 cycles.

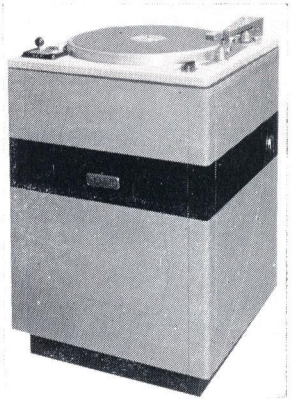
* RIAA is very newest standard adopted by Record Association of America.

ORDERING INFORMATION

Complete chassis as listed below with dual sapphire styli	**CB-210**
Complete chassis as listed below with dual diamond styli	**CB-210A**
Model CB-210 in CAB-6 cabinet pictured below	**CB-225**
Model CB-210A in CAB-6 cabinet pictured below	**CB-225A**

What is supplied in the CB-210:

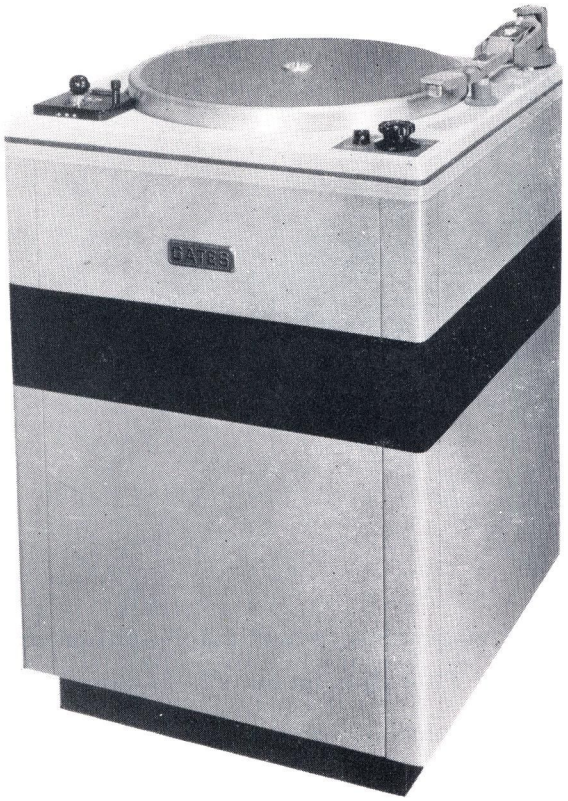
- 1 CB-100 turntable chassis.
- 1 Viscous damped arm for records up to 17".
- 2 GE styli for 1 and 2½ mil.
- 1 GE dual pickup cartridge. (Turnover type)
- 1 Equalized preamplifier with tubes and self-contained power supply.
- 1 Arm rest.
- 1 Equalizer switch with plate.



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GATES

CB-150-160 TRANSCRIPTION TURNTABLES



These models include Gates CB-100 direct shift, 3-speed turntable mechanism in CAB-6 floor cabinet and two popular selections of pickups, styli and equalizers.

CB-150 TRANSCRIPTION EQUIPMENT

For all discs including standard or microgroove. Includes CB-100 mechanism, sponge rubber strip mounted on CAB-6 cabinet, Gray 108C viscous damped pickup arm, Gray 602C variable equalizer, dual slip-in reluctance pickup cartridges, dual diamond styli, 2½ mil. and 1 mil. diameter, wired and ready to use. Provides all playback curves used in broadcasting today. Output level approximately −67 dbm at 4.7 CM/SEC. Output impedance 150/250 ohms. Suggest use with M-5531 preamplifier and power supply where high level output desired.

CAB-6 CABINET

Designed specifically for the CB-100 transcription mechanism. Finished in medium gloss gray with center band and inset base in black. Has full size removable back door. Four leveling screws provided. Made of 5-ply cabinet maker's seasoned birch, sealed, and finish gives metal appearance. Size: 21¼" square and 29½" high +1" for leveling screws. Wood is employed in larger size turntable cabinets to prevent resonance and audio feedback from nearby monitoring loudspeakers.

CB-160 TRANSCRIPTION TURNTABLE

For all discs where pickup cartridge with stylus is changed when moving from standard to microgroove. Includes CB-100 mechanism, sponge rubber strip mounted on CAB-6 cabinet, Gray 106SP arm with Gray 602C variable equalizer, reluctance pickup cartridge and 2½ mil. diameter stylus, (1 mil. optional). Equipment is wired, ready for use. All playback curves used in broadcasting today are available. Output level -67 dbm at 4.7 CM/SEC. Output impedance 150/250 ohms. M-5531 amplifier is recommended where high level output is desired.

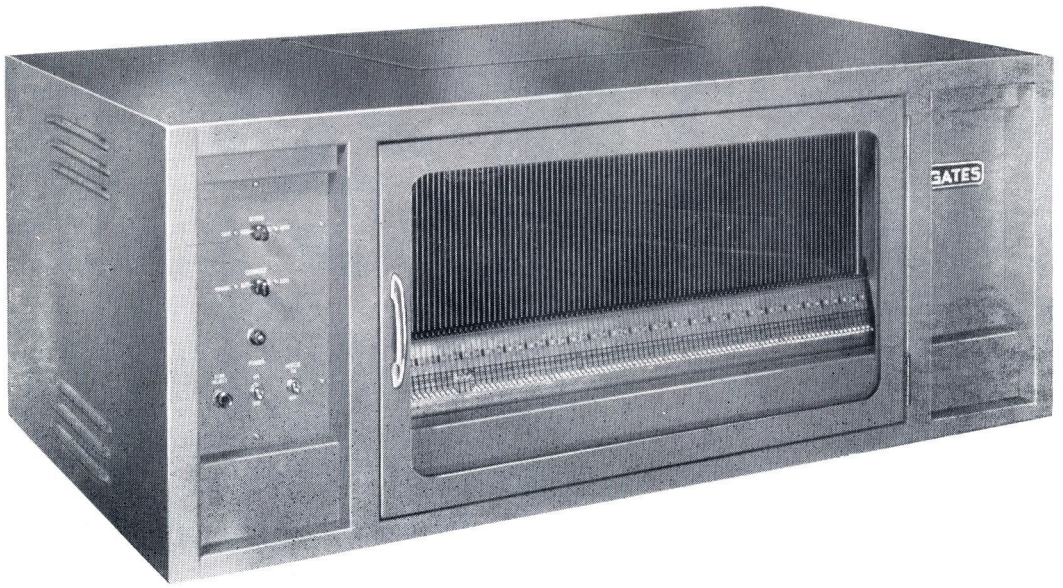
ORDERING INFORMATION

CB-150 Turntable complete	**M-5242**
CB-160 Turntable complete	**M-5243**
CAB-6 Cabinet only	**M-5269**

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GATES

"AUTO-TRANS" AUTOMATIC PROGRAMMING EQUIPMENT



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

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

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

SPECIFICATIONS

SIZE: 38½" wide, 17½" deep, 16¼" high (front door closed).

FINISH: Medium gloss gray.

OUTPUT LEVEL: —20 dbm.

OUTPUT IMPEDANCE: 150/600 ohms.

POWER: 115 volts, 60 cycles.

RESPONSE: Standard NARTB curve for 45 RPM.

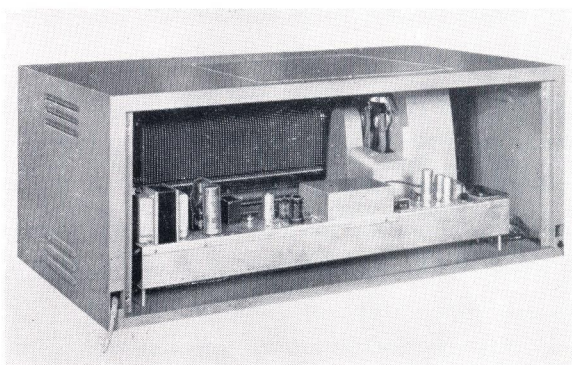
NOISE: 55 db or better below —20 dbm (preamplifier)*.

DISTORTION: .5% or less 50-15,000 cycles at —20 dbm output.

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

ORDERING INFORMATION

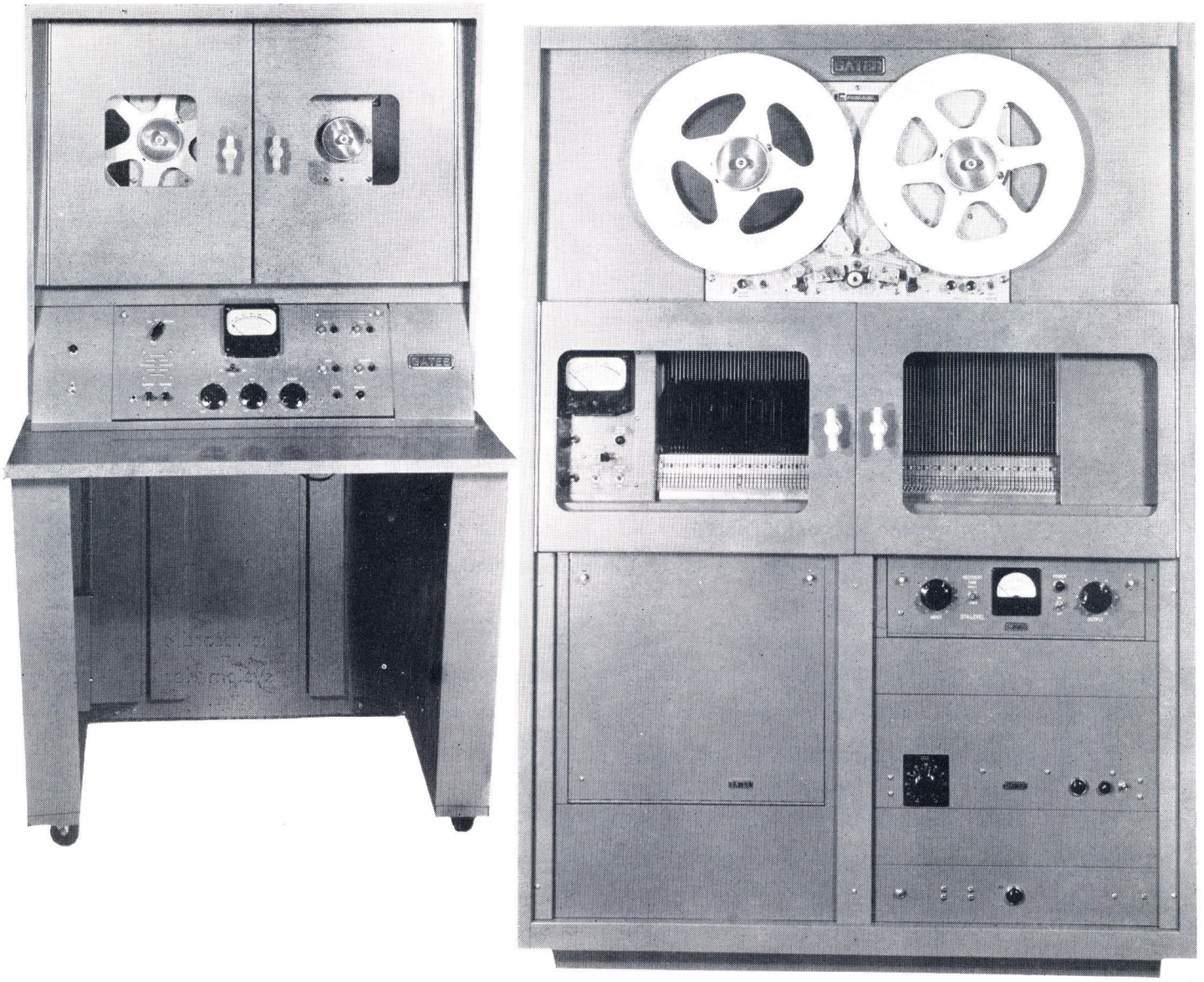
"Auto-Trans" complete with remote control station and ready to use M-5452



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GATES

"AUTO-STATION" AUTOMATIC RADIO PROGRAMMING



"Auto-Station", recognized by many as the biggest boom to profits in the annals of radio, is the basic equipment in a series of profit making devices for better radio broadcasting at lower cost. Announcers on staggered shifts may now work together, providing multiple voices for commercials and snappy, fast moving shows. The station personnel now become a team working together for more profits. Time used to put programs on the air is converted to time used for planned programs, ways to create a bigger audience and ways to make more sales.

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

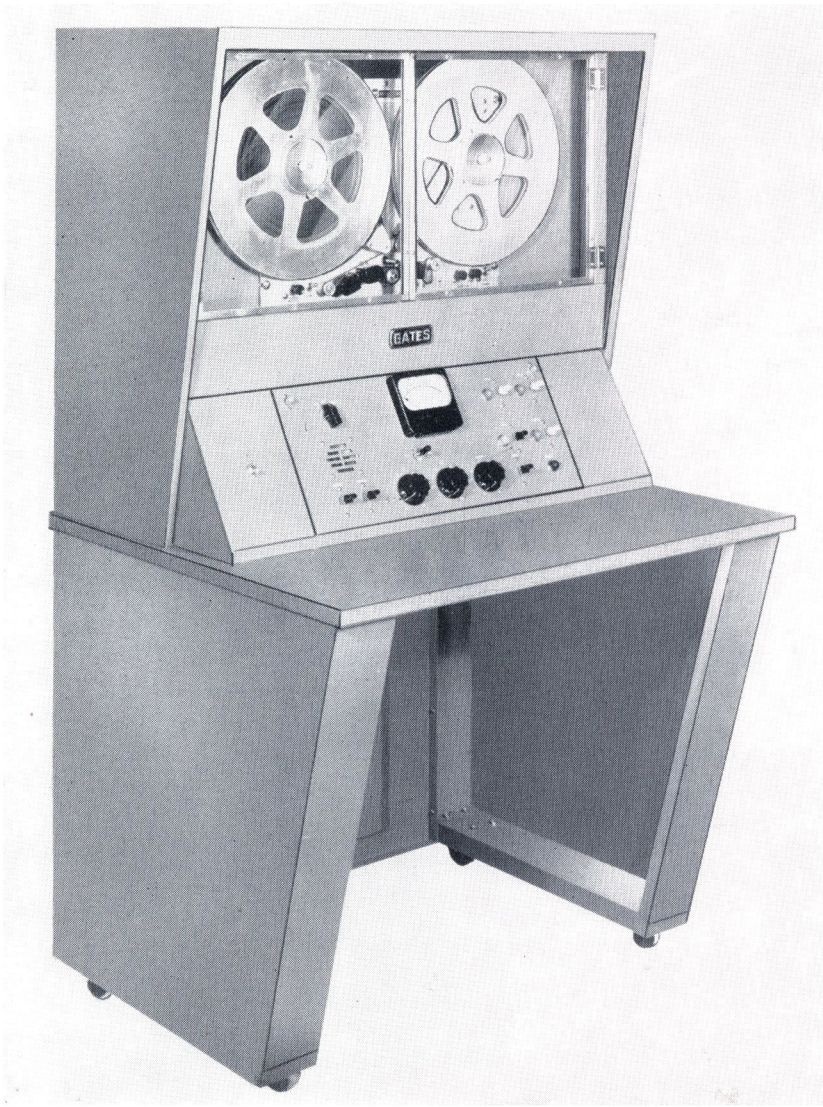
The Automatic Playback Unit is employed for the actual broadcasting of the program. The master tape created on the Production Unit is moved to the Playback Unit and handled entirely automatically.

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GATES

"AUTO-STATION" PRODUCTION UNIT

The Production Unit of the "Auto-Station" consists of a heavy duty tape recorder, a control panel and the necessary oscillators and relays for controlling the tape recorder. The "Auto-Station" employs the twin track method of tape recording which offers many advantages over monaural recording. In twin track recording, one-half of the tape carries the program material and the other half is used for the sensing frequencies. In this way, there is no possible interaction between the two channels as is possible with monaural recording. Another important twin track advantage is that many functions can be controlled, each with its own sensing frequency, without dependence on pulsation of a single frequency.



The control panel in the Production Unit includes a two channel mixer, sensing control switches and a monitoring speaker. One mixing channel is normally used for a microphone and the remaining channel is connected to a turntable or tape recorder. If more mixing channels are required, an auxiliary mixer or console can be connected to the turntable channel. The turntable position allows transcribed jingles or sound effects to be mixed with the announcer's voice for production spots.

Tally lights are provided for each control function and indicate the function that is being controlled. The panel speaker can be used for editing or monitoring the recorded tape, and announcement errors can be removed at this time. A master switch mounted on the control panel provides edit and monitoring facilities and also prevents accidental erasure of program material. A large 4" VU meter indicates the proper recording level from the microphone and turntable channels.

Time savings are easily computed although it is recognized that the program format among stations is not the same. For example, if a 30-minute program consists of seven one-minute announcements, the total time required to make up the half-hour program would be only ten minutes, including opening and closing theme. An eight hour time segment can be completed in slightly over two and one-half hours. Phonograph records are not dubbed onto the tape, but are played directly by the Playback Unit. The announcer thus makes a series of announcements without having to wait for each phonograph record to finish.

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GATES

"AUTO-STATION" AUTOMATIC PLAYBACK UNIT

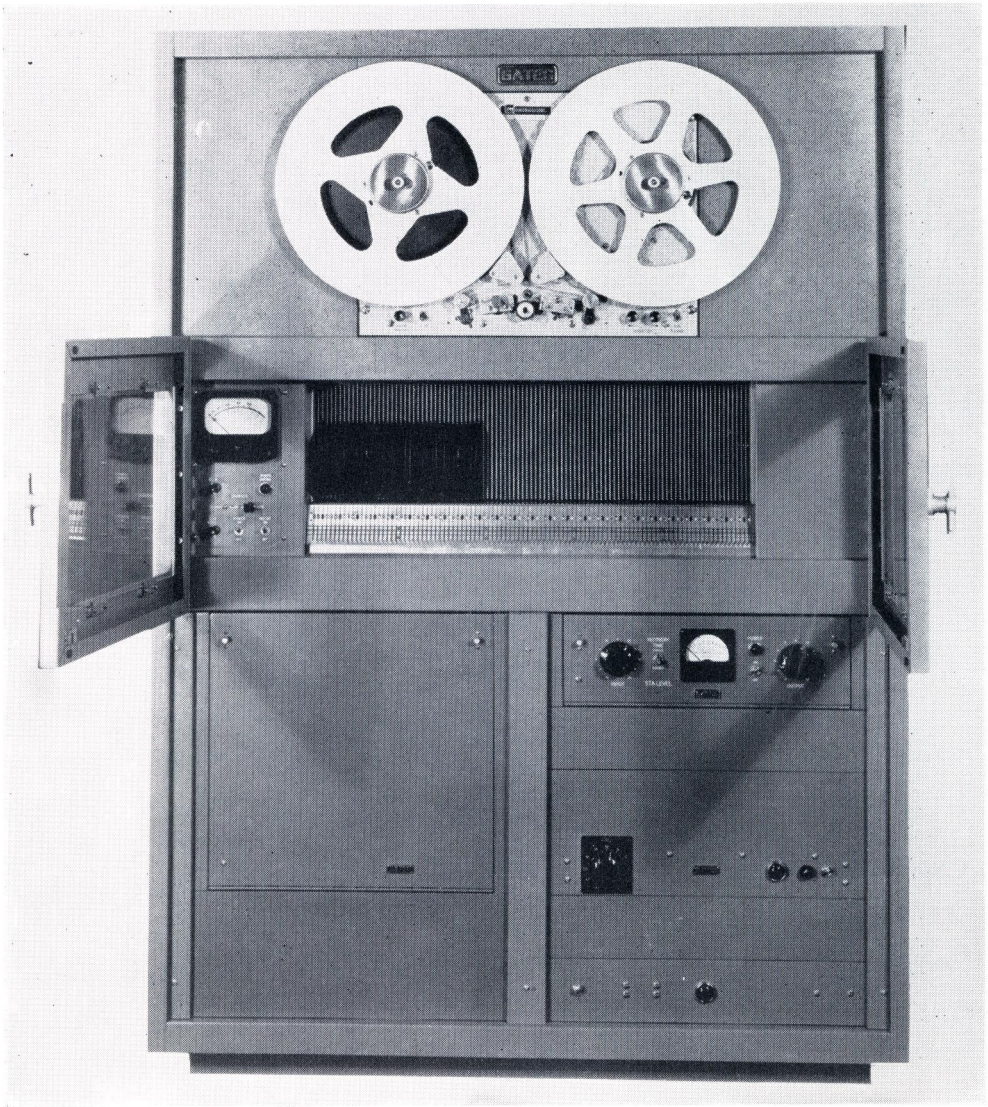
The Automatic Playback Unit airs the program you have created on the Production Unit. The tape transport mechanism holds up to 4800' of tape and operates at either 3¾ or 7½ inches per second. Thus, four hours of announcements, themes and jingles when added to the 100 double-faced records, averaged at 3 minutes per side, gives a total time capacity of 14 hours. When adding a delayed tape program or two, the time is further increased. Records are usually played in sequence for convenience in loading the changer but selective playing is also possible. After each record plays, a brush automatically wipes the stylus to remove any collected lint.

The Playback Unit is made up of several individual units, each of which contributes to the overall stability and accuracy of "Auto-Station". The tape transport portion is identical to the one used in the Production Unit with the exception that no record facilities are required. Synchronous motors assure accuracy of playback time.

The Seeburg Select-O-Matic record player has a capacity of 100 double-faced records of 200 sides. Beneath each record slot is a key switch that selects each record as well as selecting either side of each individual record. The variable reluctance cartridge with dual diamond styli assures long life not only for the styli but also for records.

"Auto-Station" would not be complete of course without a means for stabilizing and controlling the output level. Gates Sta-Level amplifier fills this requirement since it is capable of controlling 30 db variations in signal levels. A high quality monitoring amplifier is incorporated in the Playback Unit which can be connected to a loudspeaker for aural monitoring.

To the left of the record changer is the VU meter, indicating output level. The overall audio output may be sent either direct to the transmitter line or to the speech input console. A fixed type mixer is provided to mix at proper levels the announce changer, and two external circuits such as tape recorders or other incoming circuits.



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GATES

"AUTO-STATION" SPECIFICATIONS

PRODUCTION UNIT

SIZE: 34½" wide, 30" deep (from front edge of desk top), 62" high.

FINISH: Medium gloss gray with desk top formica.

CABINET: Cold rolled stretcher level furniture steel. Full rear access door. Double front doors, shock suspension and insulation render tape mechanism noiseless adjacent to a live microphone.

IMPEDANCE: Microphone 30/50 or 150/250 ohms. Turntable 150/250 ohms.

LEVELS: From turntable —20 dbm.
From microphone —60 dbm.

NOTE: Turntable input may be used as input source from main speech input console for dubbing, where desired.

VU METER: 4" illuminated adjusted for proper tape recording level.

MONITOR SPEAKER: Panel mounted, selector key to cue, edit and record. When recording speaker is muted.

TAPE KEY: Forward and reverse direct on control panel.

ERASE: It is impossible to erase at any control position except record. Operator may edit freely without fear of erasure.

RELAYS: Standard telephone type.

CONTROL TONES: 290, 700 and 1300 cycles.

CONTROL KEYS: 290 cps operates record changer. 700 and 1300 cps operates any other circuit to be attached to Playback Unit.

TAPE SPEED: 3¾" second or 7½" second (if ordered).

POWER: 115 volts, 60 cycles.

AUTOMATIC PLAYBACK UNIT

SIZE: 42½" wide, 24" deep, 60" high.

FINISH: Medium gloss gray.

CABINET: Stretcher level furniture steel. Full size rear access door. Front doors to enclose record changer to prevent dust on records. Drop down front access doors on all serviceable equipment.

OUTPUT LEVEL: +8 dbm constant by use of Gates Sta-Level.

OUTPUT IMPEDANCES: 600 ohms.

INPUT IMPEDANCES: 600 ohms at +8 dbm for two external sources such as tape playback, etc., and automatically controlled by tone channels.

RECORD CAPACITY: 100 discs, both sides, at 45 RPM.

VU METER: Read +8 VU to line.

STYLUS: Diamond, quick replaceable type.

RESPONSE: Standard NARTB (RIAA), old NAB or filter curve for 45 RPM records. ±2 db from 50 to 5,000 cycles on announce-tape. ±1 db from 30 to 15,000 cycles on auxiliary inputs.

POWER: 115 volts, 60 cycles.

ORDERING INFORMATION

Complete "Auto-Station" including Production and Playback Units and one 4800 ft. roll of tape M-5429

OPTIONAL EQUIPMENT

Ready to operate as supplied. Tape playback equipments may be those now possessed by station or listed in this catalog. Two simple attachments are supplied to make tape playbacks automatic when used with "Auto-Station". These do not affect tape playback for other service.

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GATES

AUTOMATIC PROGRAMMING --- THE NEW WAY!

Men heading American business today, and broadcasting is no exception, did not get there by going along with the old way or even current trends in thinking. Instead, they dared look at tomorrow with imaginative vision. They turned this vision into profitable action. The result is a progressive industry with a rich history of technological advances and greatly improved programming methods.

The words "new sound" are often heard in today's broadcasting. This refers to the use of echo chambers and other methods exampling the continual search for improvement—new ideas. Automatic programming actually heads the list for management with imaginative vision. The Gates "Auto-Station" and "Nite-Watch" are two outstanding examples of automatic programming equipment for creating better programming and added profits. Those who will be willing to tackle automatic programming, recognizing the profitable end result, will be the broadcasters with the head start toward tomorrow.

Automatic programming is not thought of as a way to reduce staff. Instead, a progressive system to instill enthusiasm in the staff for better "on the air" selling through multiple voices and development of the **new sound** with planned and alive programming. Time actually saved may be converted to selling time, public relations and other profit building activities.

The broadcaster installing automatic programming should understand that operating smoothness comes with practice. Like automation in accounting or digital computers, adjustments in operating procedures are necessary. The first day develops new and creative subjects in programming techniques. It is these subjects that open up the new vistas for better broadcasting.

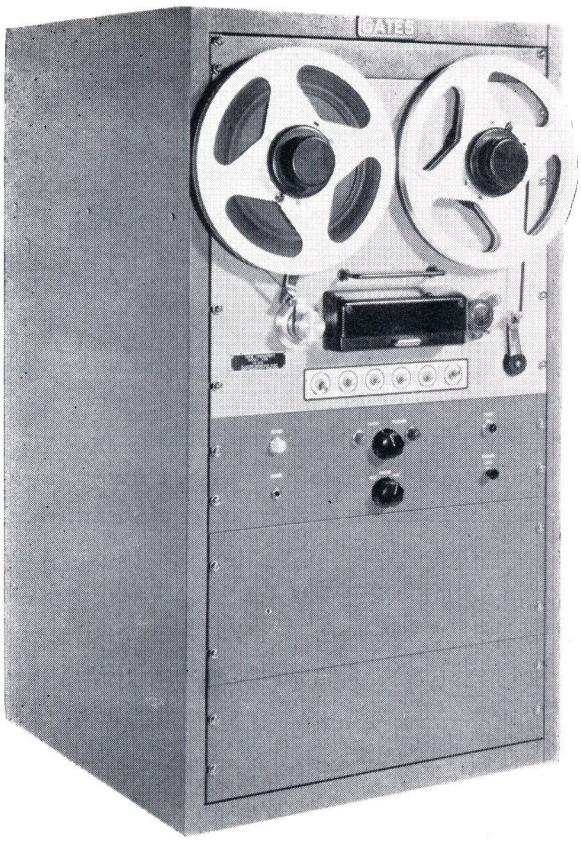
Preceding pages describe "Auto-Station", the most complete automatic programming system ever manufactured. Here, the broadcaster may produce programs while other programs are being reproduced. — He may automatically switch to other programs such as delayed tapes or another automatic record changer for 33⅓ RPM discs. In the future he may switch to remote lines as the "on air" merchandising capacity has wide and often limitless possibilities.

Following pages tell of "Nite-Watch", with the name referring to evening or after evening programming where automation has made the greatest inroads. Obviously, day programming is as much a part of this system as broadcasting itself. "Nite-Watch" permits announcing, dubbing, automatic record playing, along with a professional tape recorder and automatic transcription equipment for separate use too. — For the broadcaster wishing a good modest cost system to develop short or long periods of effortless programming, "Nite-Watch", to the profit-conscious broadcasting station with progressive ideas, will be revealing in scope and capacity.

GATES RADIO COMPANY

SUBSIDIARY OF THE HARRIS-INTERTYPE CORPORATION

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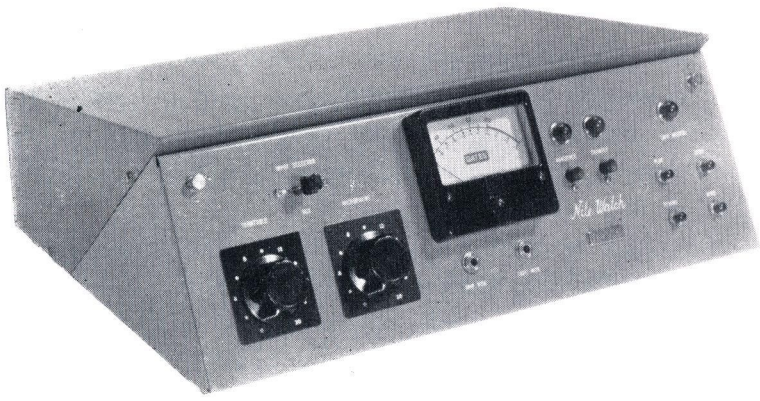
Tape and Control Cabinet

"NITE-WATCH"

Automatic Programming System

Gates now offers another new automatic programming system to provide hour after hour of continuous programming. Designed specifically for the purpose of being a business builder through the ability to program better and the maximum use of staff in converting waiting periods to more productive and challenging efforts.

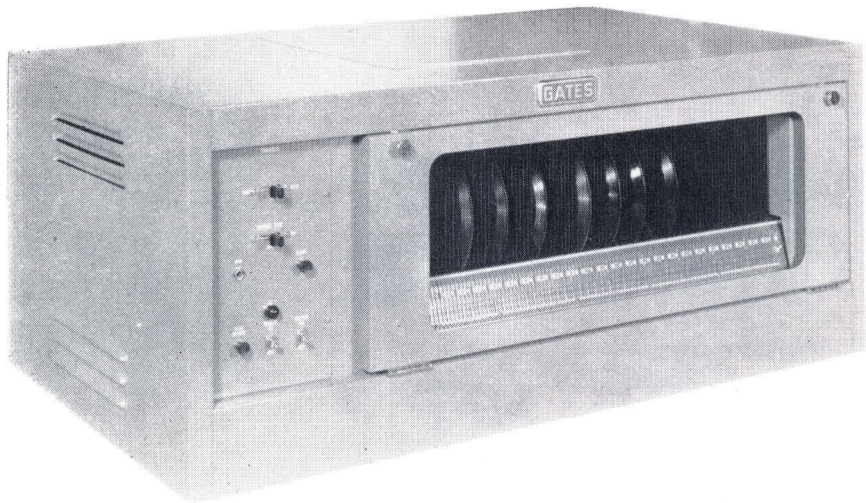
Nite-watch consists of three basic equipments supplied as a complete package: (1) production console, (2) tape control unit, and (3) the 100 record (up to 200 plays, both sides) 45 RPM automatic cueing transcription changer. Announcements are made consecutively without intervening records. In the playback,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



Above: Production Unit
Below: 100 record automatic cueing transcription equipment.

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

If desired, a simple switch control unit may be purchased as an optional accessory. In this way, the 100 record unit becomes a fully automatic transcription equipment listed as "Auto-Trans" on Page 137.



3 in 1 System

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

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GATES

"NITE-WATCH" — AUTOMATIC PROGRAMMING SYSTEM

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

Taking a 2-hour program quickly illustrates operating procedure. — Announcements are ready for the 2-hour show. The production unit (Page 143) has familiar controls, microphone mixer, turntable mixer for dubbing in jingles, etc., standard VU meter and headphone jacks. All announcements are made in sequence. After the first announcement, the announcer presses a button on the production unit that impresses an inaudible tone on the tape. He then continues with the second announcement, etc. — In the playback procedure the tape is reversed to the starting point of the first announcement. After each announcement the tone stops the tape and starts the record, which automatically cues up during the announce period so negligible dead air will exist. — Tapes may be instantly stopped, cued and reversed to correct announcing errors. Theme music or transcribed spots may be dubbed on the control tape with assured equal quality to that of the records.

In the above brief dry run we find that a 2-hour program may have ten 1-minute announcements, 22 average 20-second announcements and 34 average 3-minute discs, totaling 119 minutes, yet using 17 minutes of actual announcing time. Double this and 4 hours would use 34 minutes of announcing time, etc. In practice, the announce time could take a little longer as the announcer need not talk continually. He may stop to study his next script or cue up a jingle to be dubbed. Much more important than the time saved is the opportunity for topflight programming, multiple voices without increased time and the ability to recall "fluffs" before they reach the air.

Tape transport unit is identical to the Telectro unit listed and described in detail on Page 217. It may be used for all modes of tape recording and playback when used with the production unit. Where it is desired to have the tape recorder entirely independent of the production unit, when used strictly as a tape recorder, the M5664 optional recording panel may be purchased.

The 100 record changer is described on Page 137. Diamond styli and a special equalized preamplifier assure transmission characteristics to the correct broadcast audio curve. An ingenious relay system automatically cues to within 2 seconds of sound during the announce cycle. Minimum cue time from one record to the adjacent record requires a 10-second announcement. Segue is possible (no announcements between records) with about 8 seconds dead air between plays. — By purchasing the inexpensive optional M5665 remote control switcher, the changer may be operated identically to the "Auto-Trans" on Page 137.

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

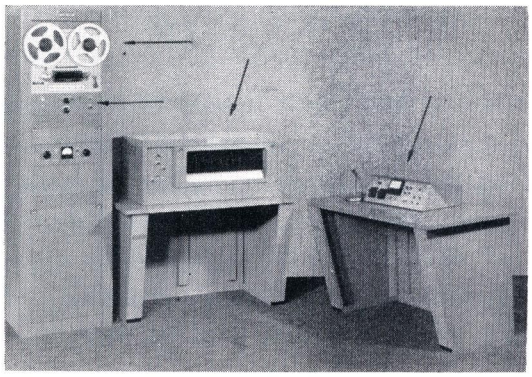
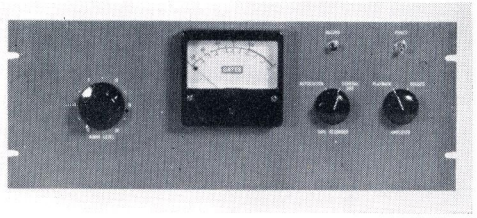
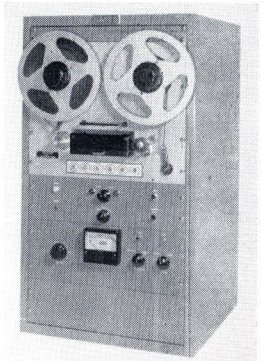


Illustration of "Nite-watch" where tape transport and control amplifier are mounted in broadcaster's rack cabinet. Arrows indicate equipment supplied as standard and balance is for illustrative purposes.



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



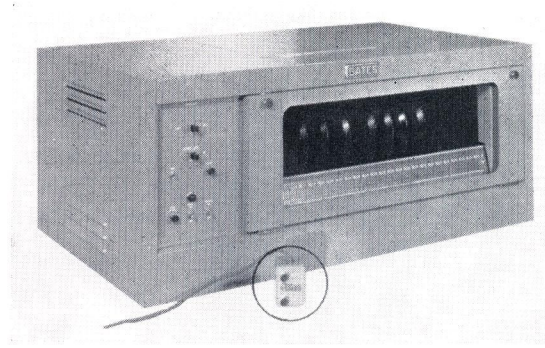
Above illustrates the M-5664 recorder panel mounted below the tape transport and amplifier control panel.

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GATES

SPECIFICATIONS

Production Unit M-5661



By adding the optional M-5665 switch control box, the changer unit may be used as a complete remote operated "Auto-Trans" as listed on Page 137.

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

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

POWER SUPPLY: Self-contained, fully regulated.

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

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

SIZE: 21" wide, 7¼" high, 14" deep.

Tape/Control Unit M-5662

TAPE TRANSPORT: See Page 217 for full specifications.

AMPLIFIERS: Separate record and playback.

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

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

SIZE: Cabinet model — 30" high, 21¼" wide, 21¼" deep.

Rack mount units less cabinet — 19" wide, 21" high.

Automatic Changer/Cueing Unit M-5663

CAPACITY: 100, 45 RPM records.

CUEING: 2 seconds or less to sound track.

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

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

RESPONSE: RIAA, NAB and cut off curve.

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

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

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

POWER: All units 115 volts, 60 cycles.

ORDERING INFORMATION

"Nite-watch" complete, includes production unit, cabinet model recorder/playback and changer unit, ready to operate M-5671

"Nite-watch" same as above but less cabinet for tape recorder and control amplifier (for your own rack cabinet) M-5628

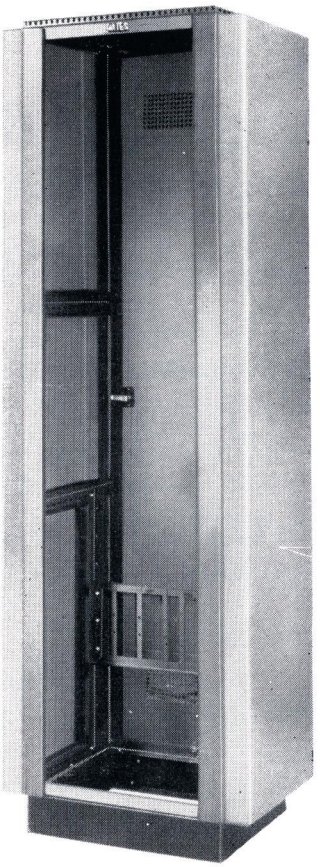
Recorder panel for use with tape recorder where use of M-5661 production console is not desired for straight tape recording M-5664

Auto-Trans control switch box for using M-5663 changer as remote operated transcription equipment M-5665

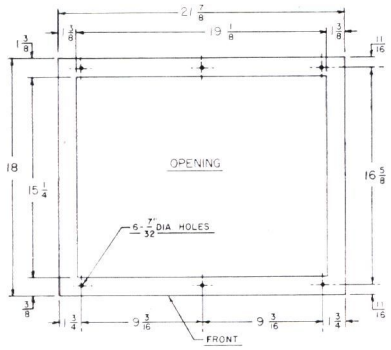
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GATES

RACK CABINET RAK-1



A unit system type of rack cabinet of open frame construction, having removable sides along with various shields, joiner trims and end bells. Similar to those found in RCA systems. Rack mounting strips are movable from front to back in 6 steps of 1¼". Basic frame includes 2 panel mounting angles, 2 terminal board mounting angles, full size rear door and panel mounting screws. Other accessories are as follows:



BASE DIMENSIONS, RAK-1 M3706

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

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

LARGE SIDE SHIELD SH-1: An electrical shield plate 15 1/8" x 28" in size.

SMALL SIDE SHIELD SH-2: Same as SH-1 above only 15 1/8" x 21" in size.

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

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

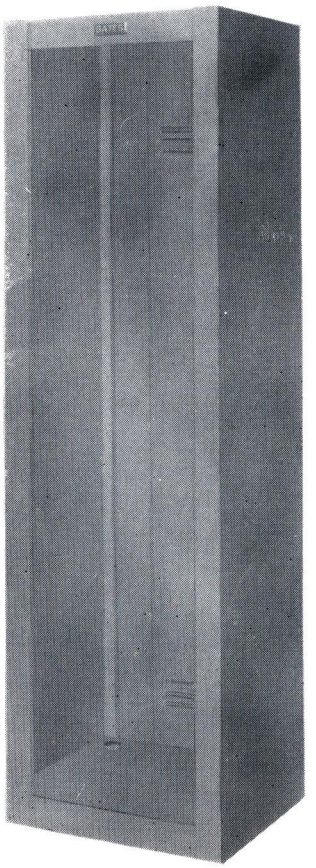
SPECIFICATIONS

HEIGHT OVERALL: 84".
WIDTH (less SP-1 side panel): 22".
WIDTH OF SP-1 SIDE PANEL: 3".
DEPTH OVERALL: 21".
DOOR SWING: 22½".
PANEL SPACE: 19"x77".
MAXIMUM CLEARANCE BEHIND FRONT PANEL: 17".
PANEL MOUNTING: Standard rack multiples 12/24 mounting screws provided.
FINISH: Medium gloss gray.
NET WEIGHT RAK-1: 100 lbs.
SHIPPING WEIGHT: 195 lbs.

ORDERING INFORMATION

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

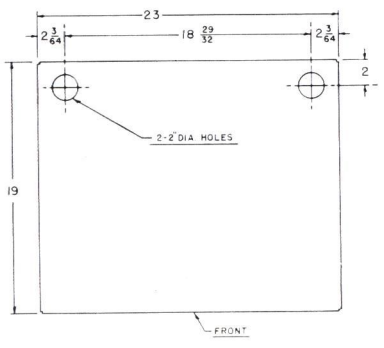
RACK CABINET RAK-2



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

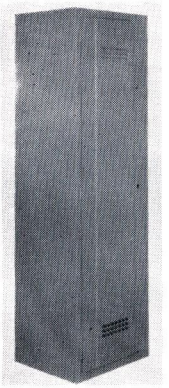
SPECIFICATIONS

HEIGHT OVERALL: 78".
WIDTH OVERALL: 23½".



BASE DIMENSIONS, M5527 RACK

DEPTH OVERALL: 19½".
DOOR SWING: 20½".
PANEL SPACE: 19"x71¾".
CLEARANCE BEHIND PANEL: 17".
PANEL MOUNTING: Standard rack multiples 12/24 mounting screws provided.
FINISH: Medium gray.
NET WEIGHT: 120 lbs.
SHIPPIPNG WEIGHT: 140 lbs.



ORDERING INFORMATION

Rack Cabinet	RAK-7
Joiner Trim	M-5577

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RECORD-TAPE SERVICE CABINET

In the handling of records and transcriptions at the point of usage, the M-5611 record-tape service cabinet has been designed to largely eliminate a long felt need. No longer need discs be indiscriminately stacked and conducive to error. Built to floor mount in close proximity to the turntable or desk and tilts up to bring discs to the operator's finger tips.

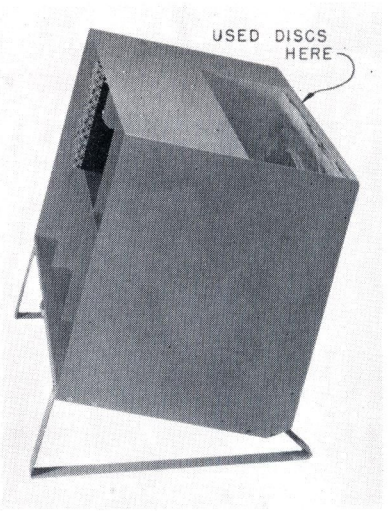
To the top front are four compartments, 8½" high, 4¼" wide and 7½" deep. At the bottom are two more compartments, 8½" high, 8½" wide and 7½" deep. At the left is a compartment, 17" high, 5" wide and 14" deep. This construction of compartments will handle 7", 10", 12" and 16" discs plus all size tape reels.

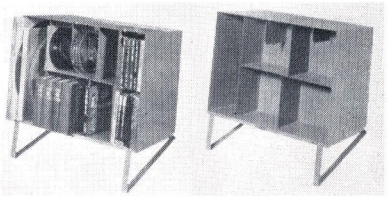
At the top back is the discharge section for all size discs and tapes after usage. Finish is in gloss gray. Made of 20 gg. furniture grade stretcher level steel, resistance welded. Size: 22" wide, 14½" deep and 24" from floor to top of front. Legs are removable.



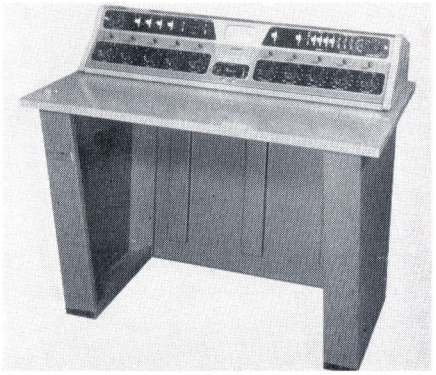
Recognizing a substantial demand, the M-5611 is machined and produced in quantity to effect a low selling price. The M-5611 cabinet is strictly commercial and built for usefulness and glamour.

Record-Tape Service Cabinet M-5611





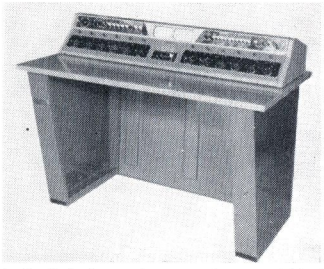
DUALUX DESK



Designed specifically for the Dualux speech input console listed on Page 96 and the TV-10 television audio console on Page 116. May be used with any speech input console of similar size. Sides and back of 16 gg. stretcher level furniture steel finished in medium gray. Top is of formed linen formica in charcoal gray attached to seasoned 5-ply birch. Three wiring troughs extend down the inside rear to conceal wiring from console to floor. Leveling screws are on all four corners. Size: 47" wide, 30" front to back, height 29" adjustable to 30¼". Shipped knocked down.

Dualux Desk M-5372

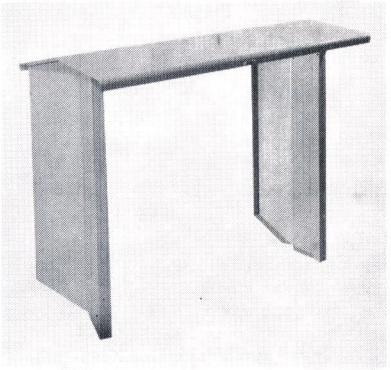
GATESWAY DESK



Same identical desk as above, only top width is 39½" for the Gatesway speech input console listed Page 100. Also ideal, with wiring trough, for use with desk type communications transmitters.

Gatesway Desk M-5371

YARD DESK



Built for the Yard speech input console listed Page 104. Only available when purchased with Yard console. See Page 109 for listing.

HORSESHOE DESKS

The famous CB4 horseshoe desks are listed on Pages 132 and 133.

INVERTERS



For converting battery current to 110 volts AC in operating tape recorders, remote amplifiers, etc., from car battery.

For 6 volts DC to 110 volts AC at 80 watts 6U-RSF
Same as above but 150 watts 6U-HSJ
For 12 volts DC to 110 volts AC at 100 watts 12U-RSF
Same as above only 200 watts 12U-HSJ



3X2500 TUBE SOCKET

Ceramic insulated with aluminum base. Top section has fingers to grip plate ring on either 3X2500A3 or 3X2500F3 tube.

Tube Socket M-3934

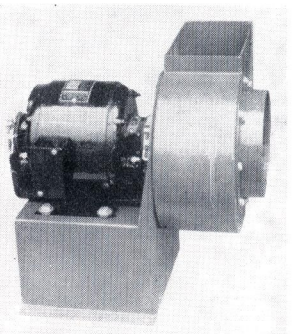
50 KW TUBE SOCKET



Designed for use with 5891, 50 KW tube as used in Gates BC-50B transmitter listed Page 4. Heavy ceramic insulation and chrome plated top ring.

Tube Socket B-40216

BLOWER



Delivers 270 CFM at 1.4" static pressure up blast. Squirrel cage, ¼ HP motor, 115/230 volts, 50/60 cycles. Supplies ample air to cool two 3X2500 tubes when operating at the slower speed of 50 cycles. 17" high, 11¼" wide and 13" deep. Boot size: 3" x 10¾".

Blower A-30687-1

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GATES

NEW DESK — RACK ASSEMBLIES

A functionally correct installation always has the result of improved operating techniques. This new concept in equipment installation places all of the equipment at the operator's finger tips. — Though designed for studio installation, the engineer will quickly recognize many applications in radio communications, recording, industrial and production testing.

The desk top attaches directly to one side of the rack cabinet to face the operator at about a 20° angle. In the single cabinet models (Fig. 1) a "U" bar end leg assembly is supplied. A wiring trough is supplied, attaches to the underside of the desk top and extends to a conduit knock-out on the side of the cabinet where the desk attaches. Desk top is formed linen base micarta in charcoal gray over ¾" Nova ply non-warping material.

Rack cabinets are made of 16 gg. furniture grade steel with full length removable rear door. Dimples are punched in the bottom for easy moving on the floor. Finish is in medium gloss gray. Standard rack multiple drillings are provided.

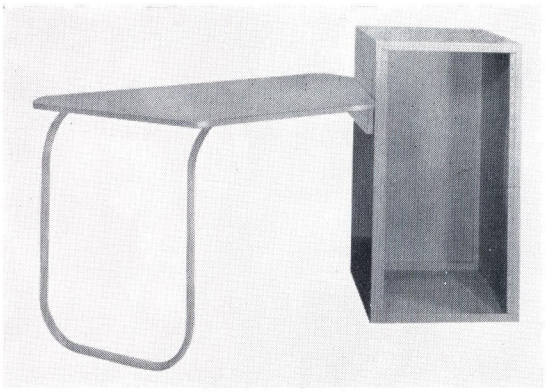


Fig. 1

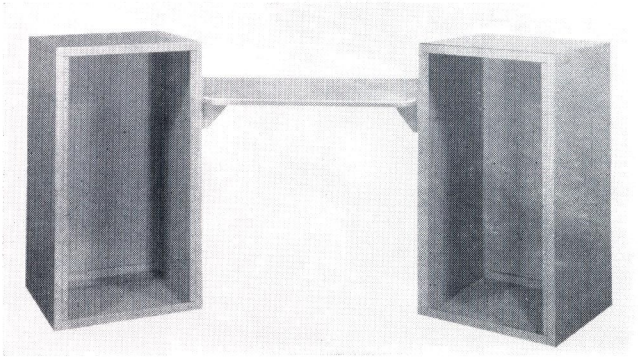


Fig. 2

SPECIFICATIONS

LARGE DESK TOP: 37½" across front. 67½" across back, 26" deep.*
SMALL DESK TOP: 28½" across front. 58" across back. 26" deep.**
RACK CABINET: 37¾" high, 21¼" wide, 21¼" deep.
34½" of 19" rack space.
20" inside depth clearance.
Knock-outs in bottom and side for wiring trough entrance.

WHAT IS FURNISHED: Desk top as ordered, single or dual cabinets as ordered, leg assembly (single cabinet models), wiring trough, all assembly hardware and rack mounting bolts.

* for Studioette (Page 110) or similar sized equipment.
** for Gatesway or Yard (Pages 100, 104) or other similar sized equipments.
NOTE: Special top sizes available with minimum delay.

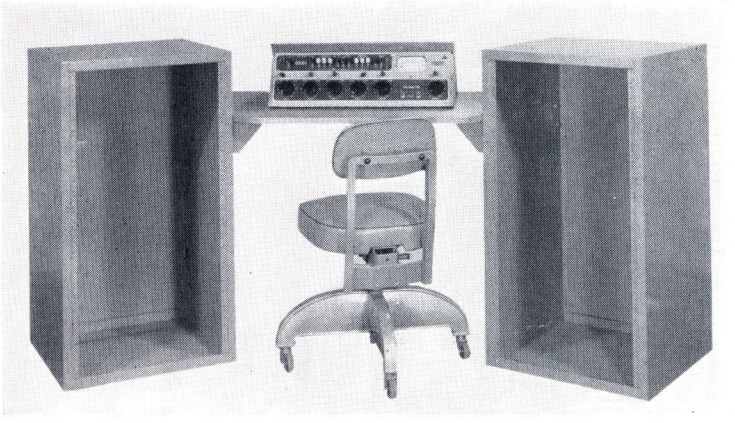


Fig. 3

ORDERING INFORMATION

Small desk with one cabinet (Fig. 1)	**M-5647**
Large desk with one cabinet (Fig. 1)	**M-5648**
Small desk with two cabinets (Fig. 2)	**M-5649**
Large desk with two cabinets (Fig. 2)	**M-5650**
Rack cabinet only	**M-5651**

FIG. 1: M-5647 desk with single rack cabinet. End leg assembly and rack may be alternated for either right or left hand installation. M-5648 is identical or desk top is wider for larger equipments.

FIG. 2: The M-5649 desk with rack cabinets on each side. Particularly well adapted for recording studios to accommodate up to four rack mount tape recorders with control console in the center. Also excellent as transmitter control desk with racks accommodating monitors, limiter, patch panel, etc.

FIG. 3: Another view of the M-5649 desk and dual rack cabinets. Note, in this instance, the Studioette speech input console (Page 110) is the same height as top of the rack cabinets. Larger M-5650 unit has wider desk top for larger speech consoles or similar equipment. The chair shown is listed on Page 221.

FIG. 4: To the right is a complete studio installation embodying the M-5647 desk-rack cabinet as basic equipment. In the cabinet (top to bottom) Magnecord P60-AX tape transport, (2) Magnecord P60-CX amplifiers (Page 219), Uni-Que cueing amplifier (Page 122), Gates Sta-Level (Page 125), C-150 patch panel (Page 129) and the bottom blank panel may be removed to install remote control, if used (Pages 89 and 91).

On the desk is the new Gates Studioette (Page 110), chair is on Page 221, and the turntables are a pair of CB-225A complete with inbuilt pre-amplifiers listed on Page 135. Here is truly operator convenience. The tape recorder even with 10½" reels as illustrated, is at finger tips, yet not in the way.

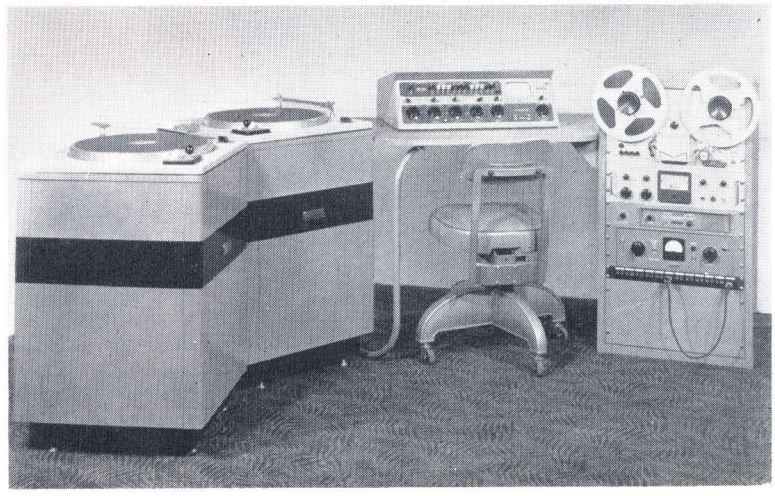


Fig. 4

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GATES

PROOF OF PERFORMANCE EQUIPMENT

CALIBRATED AUDIO OSCILLATOR

Measures audio frequencies between 30-30,000 cycles. No O reset or line calibration required. Self-contained power supply. Housed in attractive steel cabinet with carrying handle. Size: 13¾" x 7¼" x 9½".

SPECIFICATIONS

VOLTAGE OUTPUT: 10 volts into 500 ohms.

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

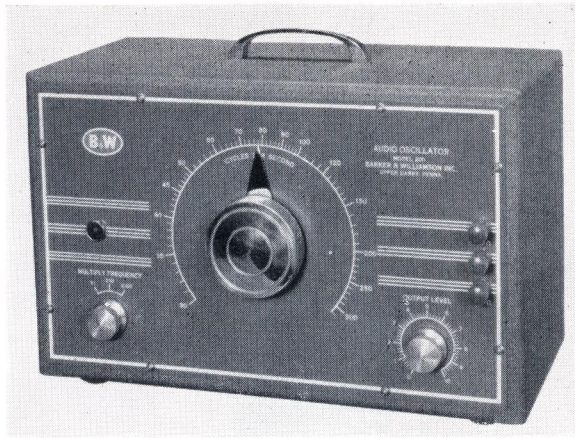
RESPONSE: ±1 db or better 30-15,000 cycles.

STABILITY: 1% or better.

CALIBRATION: ±8% of scale reading.

POWER: 115 volts, 50/60 cycles.

Model 200 B & W Audio Oscillator





NOISE AND DISTORTION METER

For measurements of noise and distortion—both audio equipment and radio transmitters. Variable frequency selective filter provides single frequency suppression circuit of 30-15,000 cycles range. Size: 13¾" x 7¼" x 9½" in attractive metal cabinet and beautifully styled.

SPECIFICATIONS

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

SENSITIVITY: (a) Noise and distortion, 0.3 volts.
(b) Voltmeter, full scale readings, 0.3, 0.1, .03, .01 and .003 volts.

CALIBRATION: For distortion ±0.5 db.
For voltage measurements ±5% of full scale at 1000 cps.

Model 400 B & W Distortion Meter

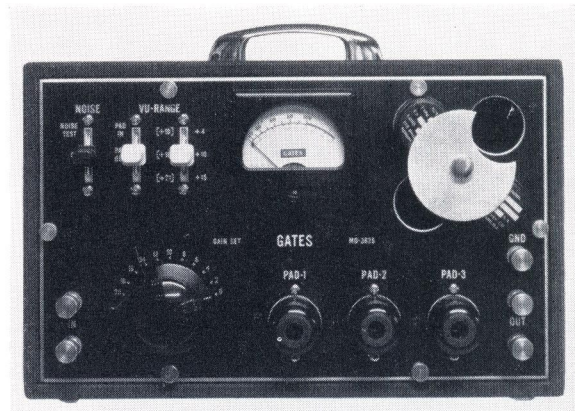
GAIN AND MEASURING SET

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

SPECIFICATIONS

INPUT IMPEDANCE: 600 ohms balanced.
OUTPUT IMPEDANCE: 30 to 600 ohms balanced.
OUTPUT LEVEL: Variable from -21 dbm to -36 dbm.
RESPONSE: ±½ db 30-15,000 cycles.
DISTORTION AND NOISE: Negligible.

Model M-3625 Gain Measuring Set



M-3626 Rectifier/Pickup Coil

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

FREQUENCY RANGE: 550-20,000 Kc. **OUTPUT IMPEDANCE:** 600 ohms.

RESPONSE: ±1 db 30-15,000 cycles. **OUTPUT LEVEL:** +12 dbm.

Complete Proof of Performance Package

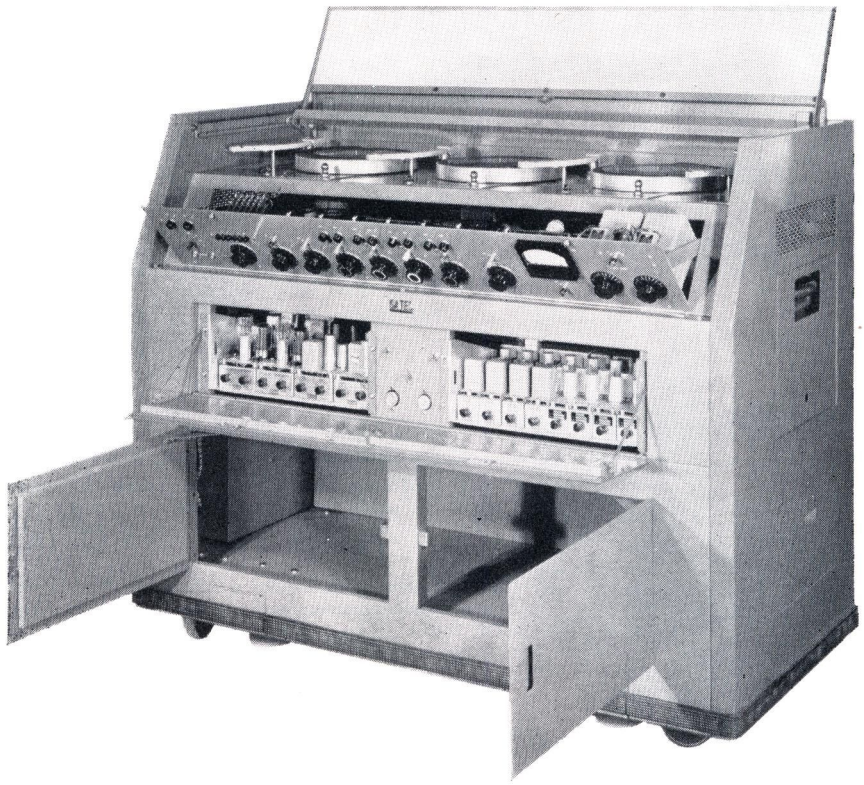
Consists of type 200 Oscillator, Type 400 Noise and Distortion Meter, M-3625 Gain Measuring Set, and M-3626 Rectifier Unit with RF pickup coil and transmission line cable. Complete package provides all facilities for proof of performance of both audio frequency and AM radio transmitters. Provided with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

Model SA-131 Complete Proof of Performance Package

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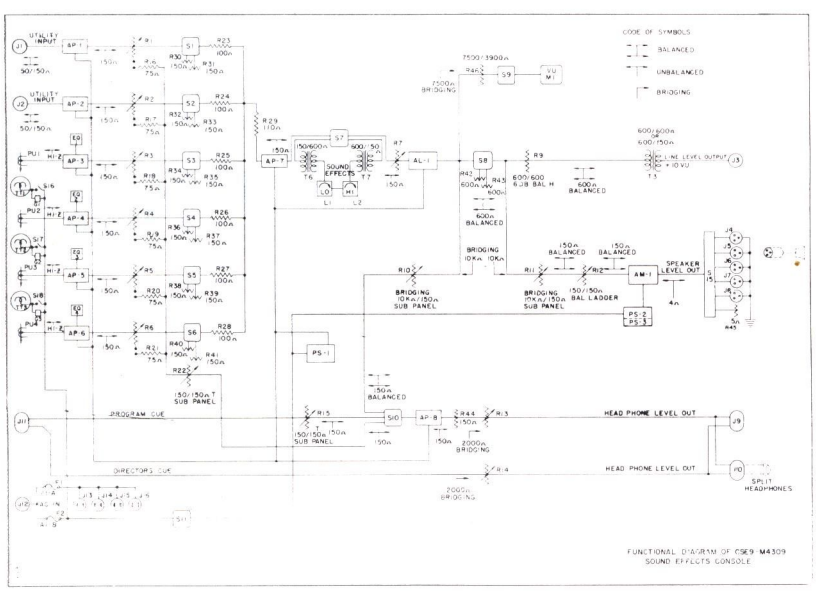
GATES

SOUND EFFECTS WAGON



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

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



FUNCTIONAL DIAGRAM OF CSE-9 M4309 SOUND EFFECTS CONSOLE

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

SIZE OF CSE-9 SOUND EFFECTS WAGON: 60" wide, 27½" deep, 48" high overall.

POWER: 115 volts, 50/60 cycles, approximately 400 watts.

WEIGHT PACKED: 400 lbs. Cubage, 75.

ORDERING INFORMATION

Sound effects wagon complete with tubes, less loudspeaker CSE-9

100% spare tube complement TK-155

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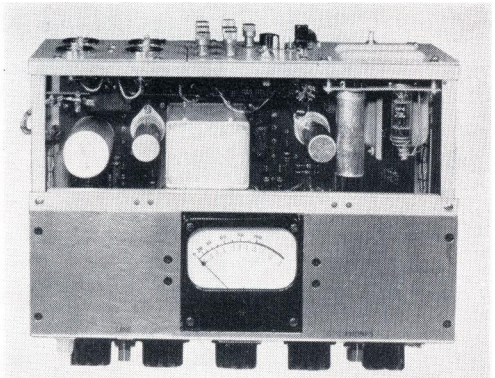
GATES

DYNAMOTE PORTABLE REMOTE AMPLIFIER

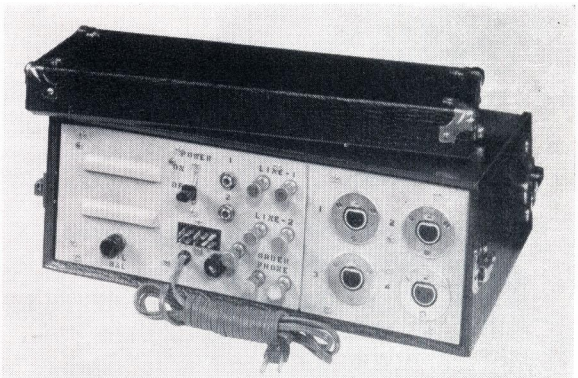


"Dynamote" has been symbolic of remote amplifying equipment for nearly a quarter century. The name originated back when the dynamic microphone was first introduced. Today's "Dynamote" is indeed modern. Weighs only 22 pounds, measuring 5⅞" high, 10¼" wide and 17¾" deep with battery compartment attached. Hinged illuminated 4" VU meter, which folds in when not used, swings to exact eye level for broadcasting.

Four mixing channels handle four or less low impedance microphones of any type. After normal mixer loss there still remains a full 90 db of gain to handle any type of pickup including artists unusual distances from the microphone. Printed wiring, not to be confused with printed circuit, adds greatly to reliability, smaller size, and has the happy result of faster manufacturing with the savings passed on to the purchaser. Battery standby, with automatic changeover in case of power failure, is an optional accessory. Nothing has been spared in making the Dynamote the finest multi-channel remote equipment available today.



Looking down on the Dynamote when removed from the case. Entire unit is constructed in rigid, light-weight frame. In this way the carrying case does not become part of the mechanical design.



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

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GATES

DYNAMOTE SPECIFICATIONS

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

Amplifier design has four audio stages and 15 db of feedback is employed. A full output of plus 22 dbm at 1% distortion is obtained. A 4 db output isolation pad provides a final maximum output of plus 18 dbm at no more than 1% distortion, or a 10 db range above the maximum permissible level of plus 8 dbm into a telephone line. Mixing controls are Daven, ladder type, 20 steps of 2 db. Input is either 50 or 150 ohms.

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

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

SPECIFICATIONS

OVERALL GAIN: 90 db +3 db from microphone input to line output.

FREQUENCY RESPONSE: +1.5 db 30-15,000 cycles.

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

NOISE REDUCTION: 60 db below +8 dbm at −50 dbm input.

MIXING CHANNELS: Four at 50/150 ohms.*

POWER SUPPLY: Full wave transformer type with AC isolated.

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

OUTPUT: 150/600 ohms. Output selected by switch to choice of 2 lines.

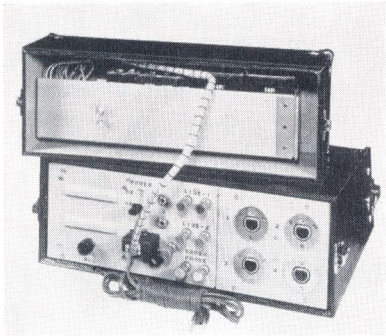
OUTPUT JACKS: Front jack across line amplifier output. Rear jack No. 1 across line being used. Rear jack No. 2 order phone across line not being used and parallels order phone terminals.

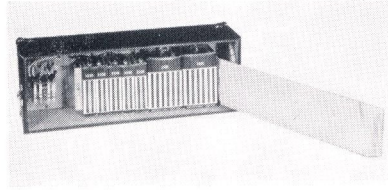
POWER: 115 volts, 50/60 cycles, 40 watts.

WEIGHT: 22 lbs. less batteries, 29 lbs. with batteries.

BATTERIES (if used): 2 type FP4, A batteries.
5 type XX30, B batteries.

*** 150 ohm input recommended for 200 or 250 ohm microphones.**

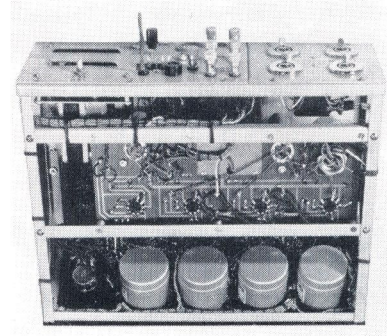




Left: Rear view with M-4933 battery compartment placed on top.

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

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



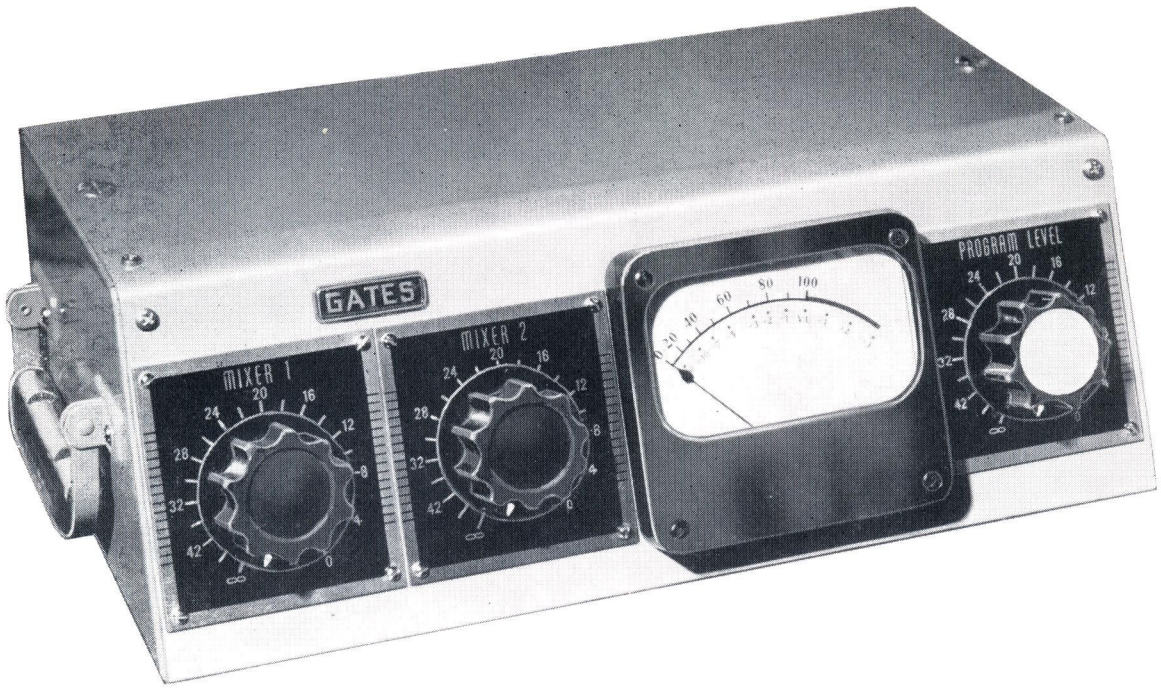
ORDERING INFORMATION

Dynamote with tubes, Cannon XL receptacles and carrying case	**M-4880A**
Dynamote with tubes, Cannon P receptacles and carrying case	**M-48880B**
Continumatic battery compartment with relay and plug, less batteries	**M-4933**
100% spare tube complement	**TK-183**
100% set of batteries	**M-4983**
Microphone plug for XL receptacles, each	**XL3-12**
Microphone plug for P receptacles, each	**P3CG12S**

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GATES

"BIAMOTE" -- TWO CHANNEL REMOTE AMPLIFIER



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

Constructed in a rugged, light-weight steel cabinet finished in gloss gray with dial plates in etched aluminum. Total weight is only 15¼ lbs. ready to use. Top removes quickly and is held in place with two twist lock fasteners. Front panel slopes at approximately 12 degrees and height is only 5 inches, permitting unobstructed view of any broadcasting event. The full size 4" illuminated VU meter is retained. "Biamote" design is functionally correct with the dual ladder type mixers to the left of the VU meter and the master gain control to the right of the meter.

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

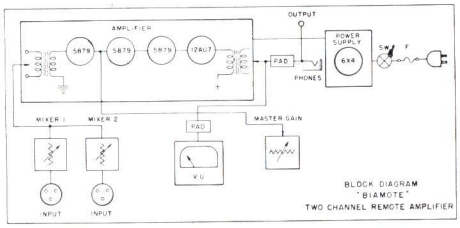
SPECIFICATIONS

NUMBER OF MIXING CHANNELS: Two.
INPUT IMPEDANCE: 50/150 ohms.*
DISTORTION: 1% or less 50-15,000 cycles +18 dbm output.
RESPONSE: +2 db 30-15,000 cycles.
GAIN: 90 db +3 db from microphone input to line terminals.
NOISE: 60 db below +8 dbm at −50 dbm input, equivalent to −110 dbm measured with mixer wide open and master gain adjusted.
OUTPUT IMPEDANCE: 500/600 ohms.
POWER: 115 volts, 50/60 cycles, 40 watts.
WEIGHT: 15¼ lbs.
SIZE: 14" wide, 8½" deep, 5" high.

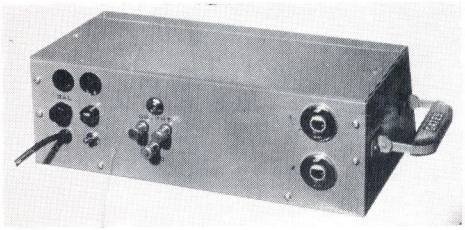
* 150 ohm input recommended for 200/250 ohm microphones.

ORDERING INFORMATION

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



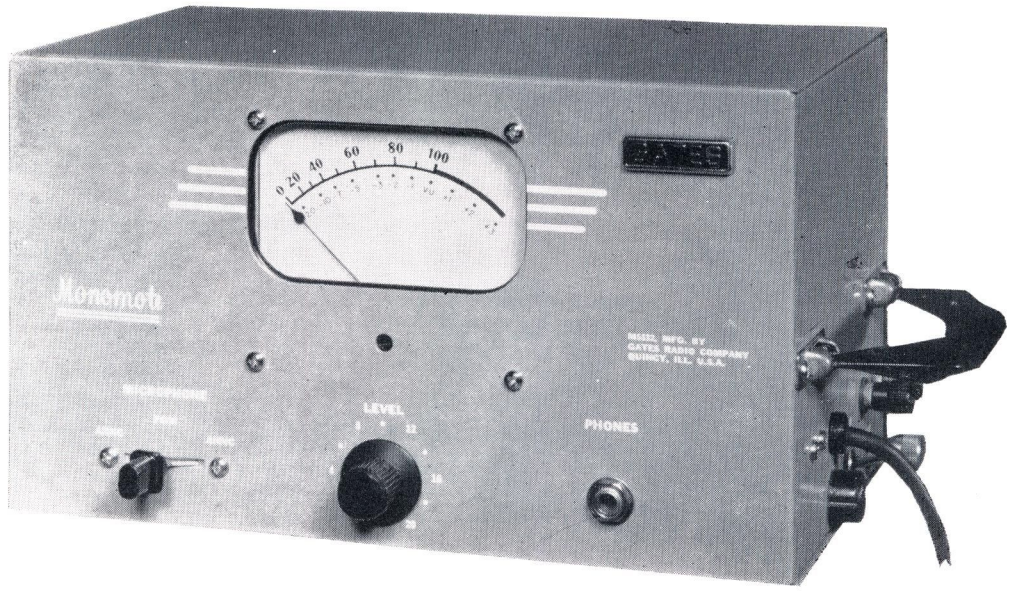
BLOCK DIAGRAM "BIAMOTE" TWO CHANNEL REMOTE AMPLIFIER



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GATES

"MONOMOTE" 2-MICROPHONE REMOTE AMPLIFIER



Two microphones switch into a single input channel. When this switch is in center position, the program microphone is in use. The announce microphone is to either right or left switch position, with left non-locking and right position locking. — In the new Gates "Monomote" is the very latest in dependable high quality remote amplifying equipment. Utilizing the very latest component developments applied to the production miracle of printed wiring, broadcasters are again pleasantly surprised with **way out in front** design at lesser than ever cost.

A 4" flush mounted and illuminated VU meter indicates zero VU when +8 dbm is fed to the line. The meter case is mounted behind the panel to prevent any obstruction and complete protection from the weather. — Front controls include the microphone selector key, gain control and phone jack. AC switch, fuse, line cord and output terminals are on the right end. Finish is in medium gloss gray.

SPECIFICATIONS

GAIN: 81 db ±2 db.

DISTORTION: 1% or less 50-15,000 cycles at +8 dbm output.
1½% or less 50-15,000 cycles at +18 dbm output.

RESPONSE: ±1½ db, 30-15,000 cycles.

NOISE: 60 db or better below +8 dbm output measured at −60 dbm input (equivalent to −120 dbm input noise).

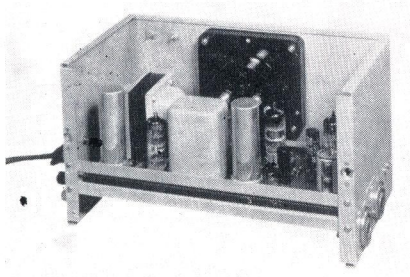
IMPEDANCES: To each microphone 30/50 or 150/250 ohms.
Output 150/250 or 500/600 ohms.

TUBES: (2) 5879, (1) 12AU7 and (1) 6X4 rectifier.

POWER: 105-125 volts, 50/60 cycles, at 15 watts.

ORDERING INFORMATION

"Monomote" Amplifier complete with tubes	**M-5532**
Microphone plugs (2 required)	**XL3-12**
100% spare tube kit	**TK-280**





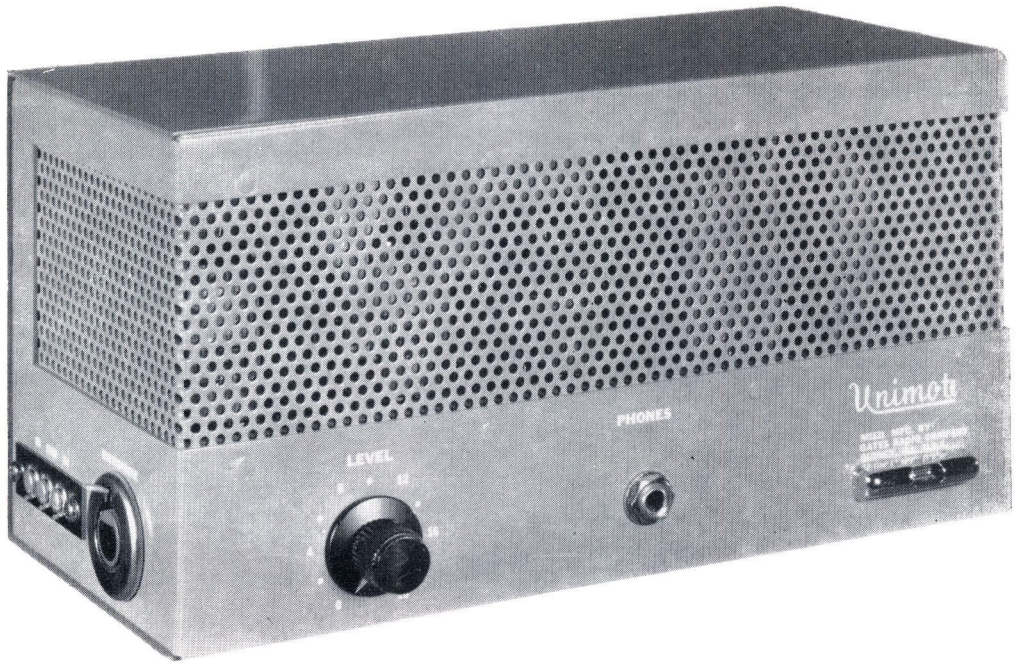
Left: Rear view of the Gates "Monomote". Cover quickly removes by loosening two snap locks. Printed wiring mounting board floats in rubber. Right: Front view illustrates the dual Cannon XL3-13 microphone receptacles. "Monomote" size is only 11" wide, 6½" high and 6½" deep, an weighs only 15 pounds complete.

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GATES

THE NEW "UNIMOTE" REMOTE AMPLIFIER

(Single Channel AC Operated)



Here is an entirely new amplifier in the Gates line. Designed to particularly fill the universal need of a fine performing, dependable and compact remote control amplifier, the M-5531 "Unimote" will perform equally well as a microphone preamplifier, turntable preamplifier, program amplifier up to +18 dbm output, repeater amplifier, isolation amplifier and as a standby amplifier for quick connection to an emergency circuit.

Size is only 11" wide, 5¾" high and 5" deep. Cover removes for 100% accessibility by two snap locks. Printed wiring is employed throughout for uniformity and dependability. Large quantity production has a price tag result both surprising and pleasing.

SPECIFICATIONS

GAIN: 81 db ±2 db.

DISTORTION: 1% or less at +8 dbm output.
1½% or less at +18 dbm output.

RESPONSE: ±1½ db from 30-15,000 cycles.

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

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

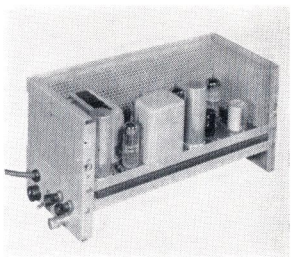
POWER: 105/125 volts, 50/60 cycles, 15 watts.

NET WEIGHT: 11 lbs.

TUBES: (2) 5879, (1) 12AU7 and (1) 6X4 rectifier.

ORDERING INFORMATION

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





Left: Rear view of "Unimote" with cover removed. AC cord, output line, AC switch and fuse are located on the right end. — Right: Front view illustrates again the right end section while feature illustration above shows left end with input terminations. Perforated grill guarantees cool operation as well as businesslike appearance. The "Unimote" may be placed on a desk, mounted to a wall or installed concealed in cabinet or desk drawer.

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GATES

M-5530 ALL-PURPOSE UTILITY AMPLIFIER



Here is a complete amplifier with self-contained power supply that may be used for so many services in radio and television stations that seemingly every broadcaster would wish one for "on call service" alone. — Produced in quantity, embodying the reliability and uniformity of all printed wiring, incorporating standard broadcast station coupling impedances and at a modest price.

Use the M-5530 All-Purpose Amplifier as:

— **An excellent single channel remote amplifier with nothing else to buy except microphone.**

— **A high gain, low noise turntable preamplifier having the extra gain needed for modern low level pickups.**

— **A line, repeater or program amplifier with performance standards approaching the very best.**

— **A standby, ready to patch in where needed.**

— **A microphone amplifier for feeding professional high level input tape recorders.**

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GATES

DESCRIPTION M-5530 ALL-PURPOSE AMPLIFIER

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

The M-5530 amplifier is perhaps the only equipment ever manufactured especially for the broadcasting industry on a mass production basis to provide a low price to high value compatibility. The entire unit is made on one printed wiring formica plate. This plate is rubber float mounted in a 16 gg. steel chassis. This chassis contains the terminations, gain control and fuse. On the left end a knock-out is provided for a standard Cannon XL3-13 connector for attaching a microphone if used as a remote amplifier. The right end, obscured in the illustration, has a barrier strip for AC connection and fuse.

SPECIFICATIONS

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

GAIN: 81 db ±2 db.

DISTORTION: 1% or less at +18 dbm output.
1½% or less at +18 dbm output.

RESPONSE: ±1½ db, 30 to 15,000 cycles.

NOISE: 60 db or better below +8 dbm output measured with —60 dbm input (equal to —120 dbm relative input noise).

POWER: 105-125 volts, 50/60 cycles, 15 watts.

TUBES: 5879 1st audio, 5879 2nd audio, 12AU7 3rd audio, 6X4 rectifier.

SIZE: 11" wide, 5¾" deep, 5" high overall.

FINISH: Medium gloss gray.

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

CUBAGE: 1.6.

ORDERING INFORMATION

All-purpose amplifier complete with tubes	**M-5530**
Spare 100% tube kit for above	**TK-280**
Chassis connector where used with microphone	**XL3-13**
Microphone plug for above chassis connector	**XL3-12**

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GATES

"AUTOMOTE" SINGLE CHANNEL REMOTE AMPLIFIER

(turns on and off from studios)

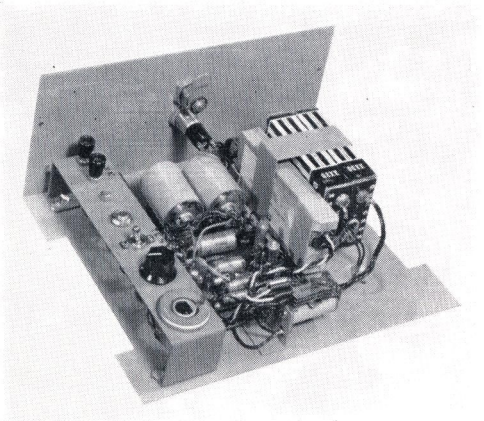


This new automatic single microphone remote amplifier allows complete control from the studio and by a large neon pilot light on the front of the cabinet a simultaneous "on air" light tells the artist when to proceed and when he is off the air. — The "Automote" is 100% transistorized and will operate for 80 hours on a set of inexpensive batteries equal to 320 fifteen minute broadcasts. By use of batteries, the remote operation becomes entirely unattended even to need of turning on unused AC power.

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

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

The transistorized amplifier has each stage temperature stabilized for operation up to 140° F. Special techniques applied develop low distortion, wide dynamic range and very low noise. Minimum life of the transistors is estimated from 6 to 10 years.



This inner view illustrates how all terminations are made inside. Gain control is adjusted, microphone and line connected and then placed under lock and key. Transistor design eliminates concern of microphonics or tube failure. One of the features of the mercury battery pack, used in the "Automote" is full output voltage at the near end of the life cycle. This assures no gradual deterioration of performance as batteries age.

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GATES

THE "AUTOMOTE"

Many unusual uses will be found for the "Automote" besides that of a remote amplifier. For example, "Automote" becomes an excellent microphone preamplifier with inbuilt warning light for the hidden studio that is around the corner from the control room or on another floor. Often tape recorders must be located in a room blind to the studios. Here again "Automote" is a complete microphone amplifier and warning light that tells the artist when to start at the time the recording engineer is ready.

The basic use of "Automote" as a remote amplifier, especially in places where listening on headphones for cue is clumsy, such as churches, ballrooms and noisy sports areas, puts the "Automote" in a most useful and distincitive class for better broadcasting through positive cue and no dead air.

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

SPECIFICATIONS

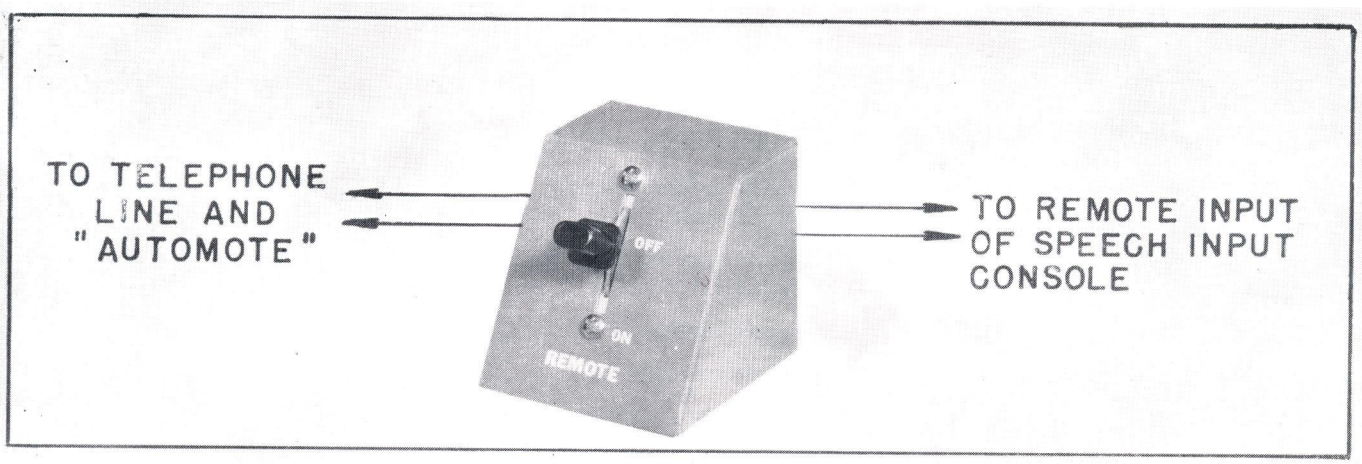
GAIN: 78 db ±2 db.
IMPEDANCES: Input 150/250 ohms. Output 500/600 ohms.
RESPONSE: ±2 db, 50 to 10,000 cycles.
NOISE: 55 to 60 db below +14 dbm measured at —60 dbm input.
DISTORTION: 2% or less 50-10,000 cycles.
BATTERIES: (2) XX30, 45 volt, and (1) M-5339 Gates mercury battery pack.
SIZE: 10½" wide, 8½" deep, 4½" high.
CONTROLS: (inside cabinet) gain control, XL3-13 microphone receptacle, off-on test switch, headphone jack and output line binding posts.
BATTERY LIFE: 80 hours minimum equal to 80 one-hour shows, 160 one-half hour shows, or 320 (nearly one year) of 15-minute daily broadcasts.
TRANSISTORS: (2) 2N106 and (3) 2N44.

ORDERING INFORMATION

Automote remote amplifier complete with one set of batteries and switch box as illustrated	**M-5500**
Microphone connector (male)	**XL3-12**
Spare mercury battery kit	**M-5337**
Spare relay battery (2 required)	**XX30**

●

Below: Simple sketch of small switch box located on or near studio control board. Remote circuit is set up in usual manner. Remote circuit is then turned on by pressing key on switch box which turns on remote amplifier and the "on air" light at the point of the remote broadcast. Where more than one "Automote" is used only a single switch box would be necessary where remote lines are patched. If patching is not employed, then switch boxes may be mounted side by side as they are only 2½" wide and offer excellent workmanlike appearance and utility.



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GATES

100% TRANSISTOR SINGLE CHANNEL REMOTE



The "Transmote"

Transmote features include non-microphonic battery operation, very small size, weighs only 3 lbs. with batteries, and a set of batteries averages 80 hours or about 12c per hour.

Five transistors are used in 4 temperature stabilized stages, the output stage being push-pulled. Level control, headset jacks, microphone receptacle, gain control and output binding posts are all properly located for both portable or stationary service. Amplifier turns on when phones are inserted in jack. A plastic jack plug is provided where phones are not used. Either way, it is impossible to close the carrying case without removing the phone plug and turning off the amplifier voltage.

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

SPECIFICATIONS

SIZE: (in carrying case) 9 1/2" long, 3 1/2" wide, 2 1/2" deep. (less carrying case) 8 5/8" long, 3" wide, 1 7/8" deep.
WEIGHT: 3 lbs. net with case.
GAIN: 78 db ±2 db.
DISTORTION: 2% or less 70-10,000 cycles.
NOISE: 55 to 60 db below +14 dbm measured −60 dbm input.
SOURCE IMPEDANCE: 150/250 ohm microphones. Slightly less gain with 30/50 ohm microphones.
OUTPUT IMPEDANCE: 600 ohms. 3 db isolation pad in output.
POWER: Three 8 volt mercury batteries in kit M-5339.
BATTERY LIFE: Approximately 80 hours.

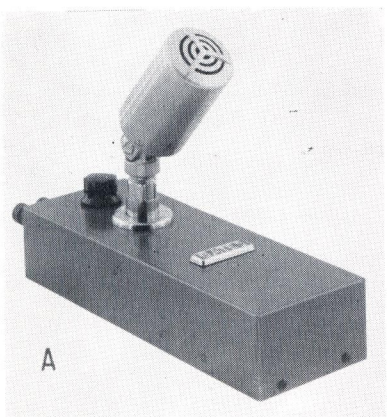
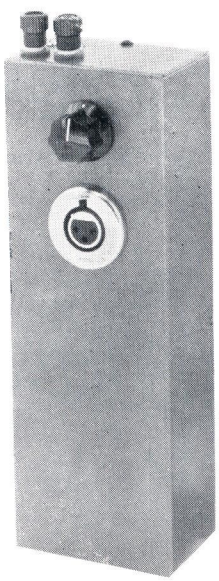


Figure A is transmote used as desk stand.

ORDERING INFORMATION

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

*** Wired, in container, ready to insert.**



M-5311A transmote less case.

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GATES

TWO CHANNEL TRANSISTOR REMOTE AMPLIFIER



The "Twinsistor"

Two microphone channels, VU meter, generous gain, low current battery operation and total weight with carrying case only 7 pounds, Size of unit: 7½" wide, 7" deep and 3⅛" high. The Gates "Twinsistor" is indeed the smallest, lightest weight multi-channel amplifier built yet.

Performance is top flight. Noise is comparable to good tube design. Response exceeds and distortion is far less than most grade A telephone lines. A plastic carrying bag of the camera type is 10½" wide, 8" high, 3½" deep. Has adjustable shoulder strap. Bag will hold amplifier, headphones and one average microphone with cable. Six transistors comprise a 4-stage temperature stabilized amplifier with push-pull output. Amplifier holds two battery kits. Changeover switch is on rear of case. Microphone receptacles are Cannon XL. Meter is standard 3" VU with fixed pad for +8 VU output at zero scale. Master gain is not required in transistor design and attenuators may be operated at any setting without overload or noise increase. Amplifier turns on when headphones are inserted in jack.

SPECIFICATIONS

SIZE: (amplifier) 7½" deep, 7" wide, 3 1/8" high, (case) 10½" wide, 8" high, 3½" deep.
WEIGHT: (in case) 7 lbs., (less case) 5½ lbs.
GAIN: 78 db +2 db from mic input to line output.
RESPONSE: ±2 db 70-15,000 cycles.
DISTORTION: 2% or less 70-10,000 cycles at +14 dbm.
NOISE: 55 to 60 db below +14 dbm measured at —60 dbm input.
MIXING CHANNELS: Two at high level (transistor preamplifier for each stage).
IMPEDANCES: (source) 150/250 ohm microphones. Slightly less gain with 30/50 ohm microphones.
(output) 600 ohms. 3 db isolation pad in output.
BATTERIES: Three 8 volt mercury in kit M-5339. Provision for 2 sets with switch changeover.
BATTERY LIFE: Approximately 80 hours per set.

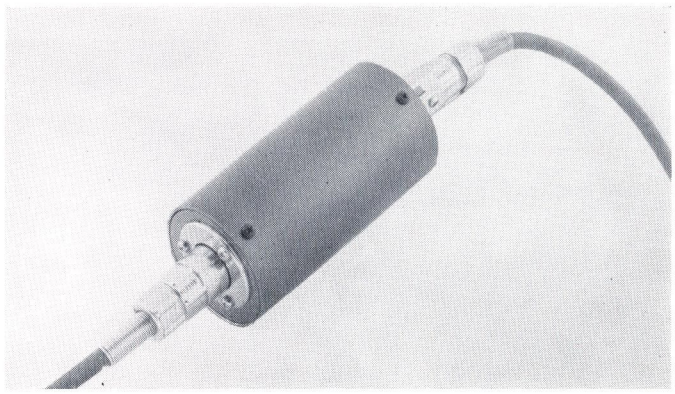
ORDERING INFORMATION

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

*** Microphone Electro-Voice 648.**

THE TUBELESS TUBE

This small transistor amplifier has particular adaptation in raising the gain of a microphone circuit. Often in TV production, or longer than normal lines, it is desirable to raise the potential gain of a microphone circuit. Designed to connect at any place into the microphone cable such as on a boom stand; or, being non-microphonic, may even be placed on the floor. Built into an aluminum tube 2" in diameter and 4½" long. Cannon XL receptacles are on each end. As the battery drain is extremely low, the tubeless tube may be turned on and left on for over a year before changing batteries. Batteries are self-contained. Set screw in case functions as On-Off switch, used only when storing. Design is a single stage transistor, temperature stabilized. Finish is in gray.



ORDERING INFORMATION

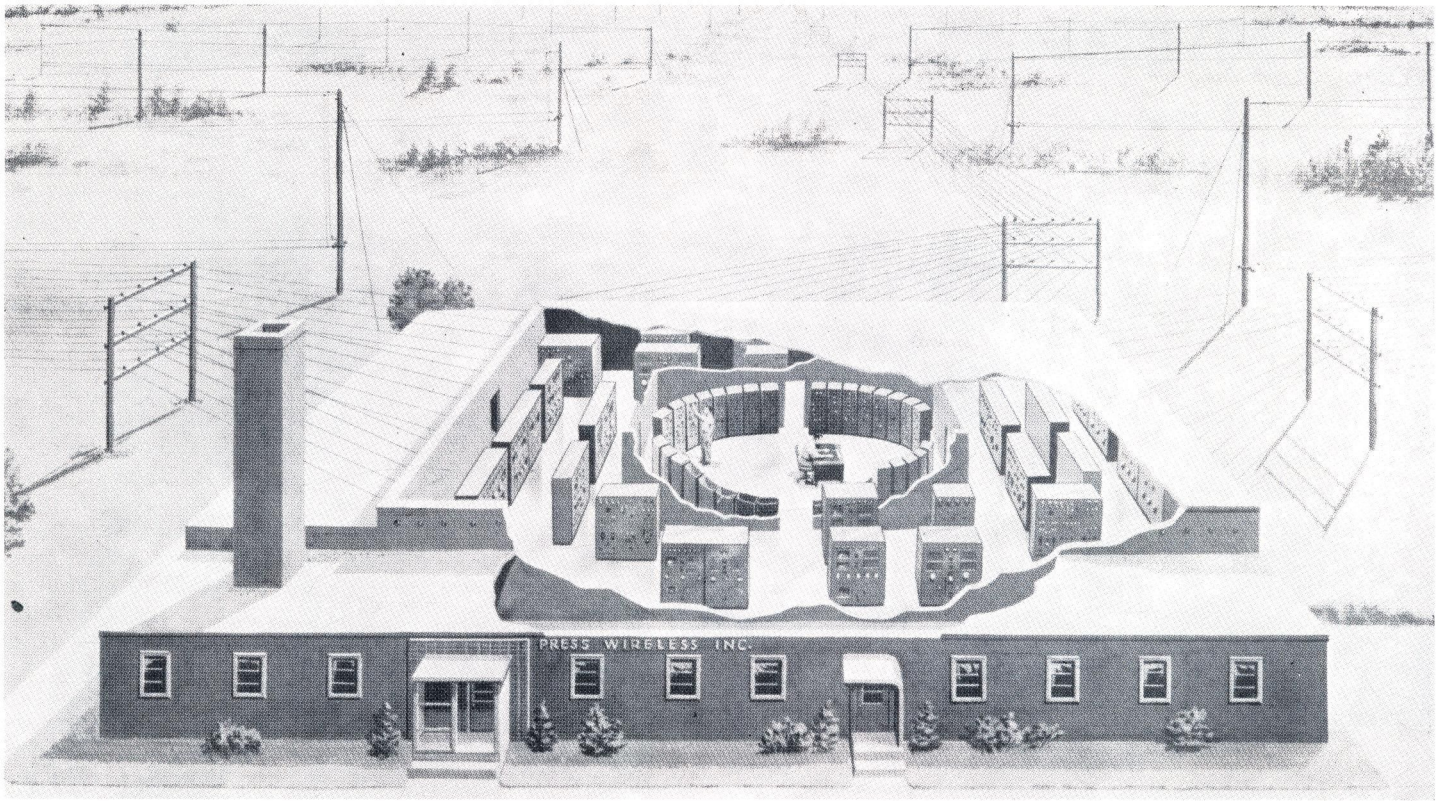
Tubeless Tube, with batteries	**M-5312**
Mating input connector	**XL3-12**
Mating output connector	**XL3-11**
Battery kit	**M-5350**

SPECIFICATIONS

GAIN: 15 db ±1 db with 150/250 ohm microphones.
FREQUENCY RESPONSE: ±3 db 70-15,000 cycles.
DISTORTION: Under 0.5% from 70 to 15,000 cps at —45 dbm output.
NOISE: 58 to 65 db below —60 dbm input level, or —118 to —125 dbm equivalent input noise.
SOURCE IMPEDANCE: 150/520 ohms.
OUTPUT IMPEDANCE: 50/150 ohms.

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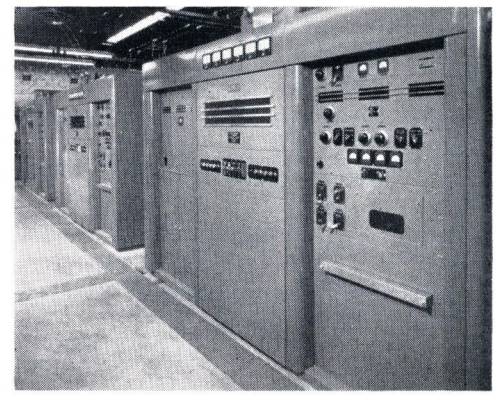
GATES

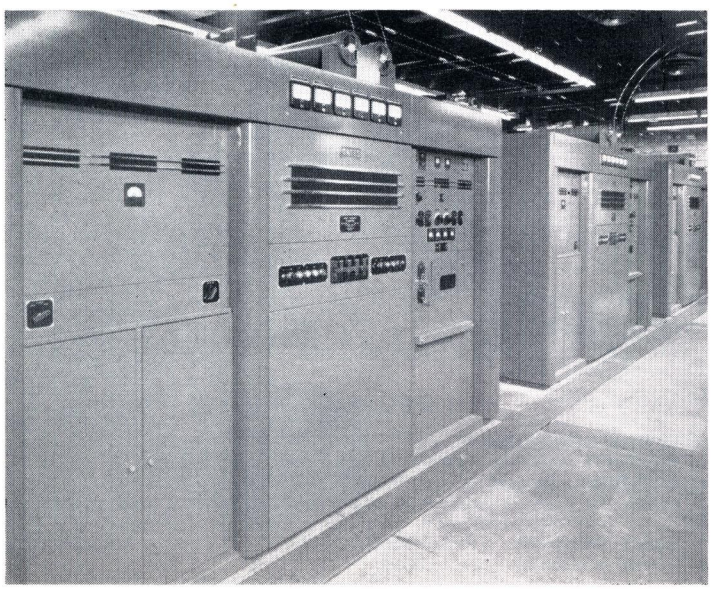


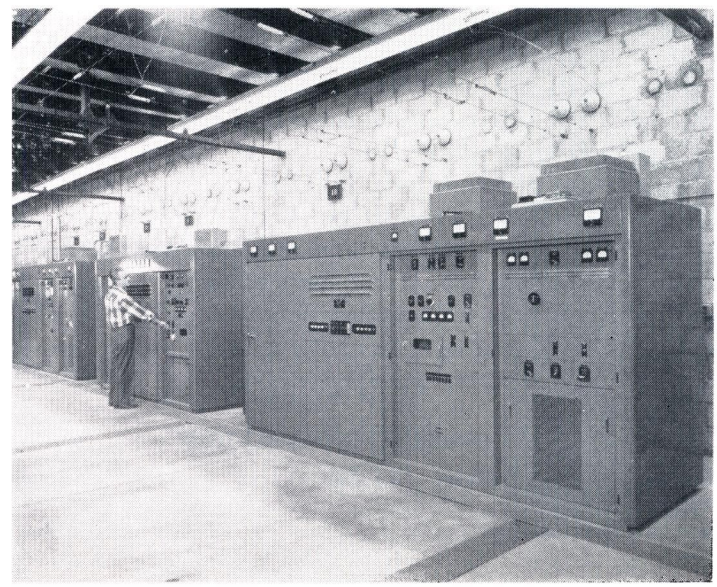
Press Wireless, Inc. —— Centereach, Long Island

World-wide, the words "Press Wireless" are synonomous with speed and efficiency. Owned by the famous publishing group*, the facilities are available to all organizations using press copy. Gates transmitters play a major roll at Press Wireless. Pictured below are two Gates 30KW and six Gates 10KW transmitters handling millions of words of press copy to all corners of the earth including the South Pole. Other Gates transmitters are used at Press Wireless foreign points along with special Gates receivers built to Press Wireless specifications.

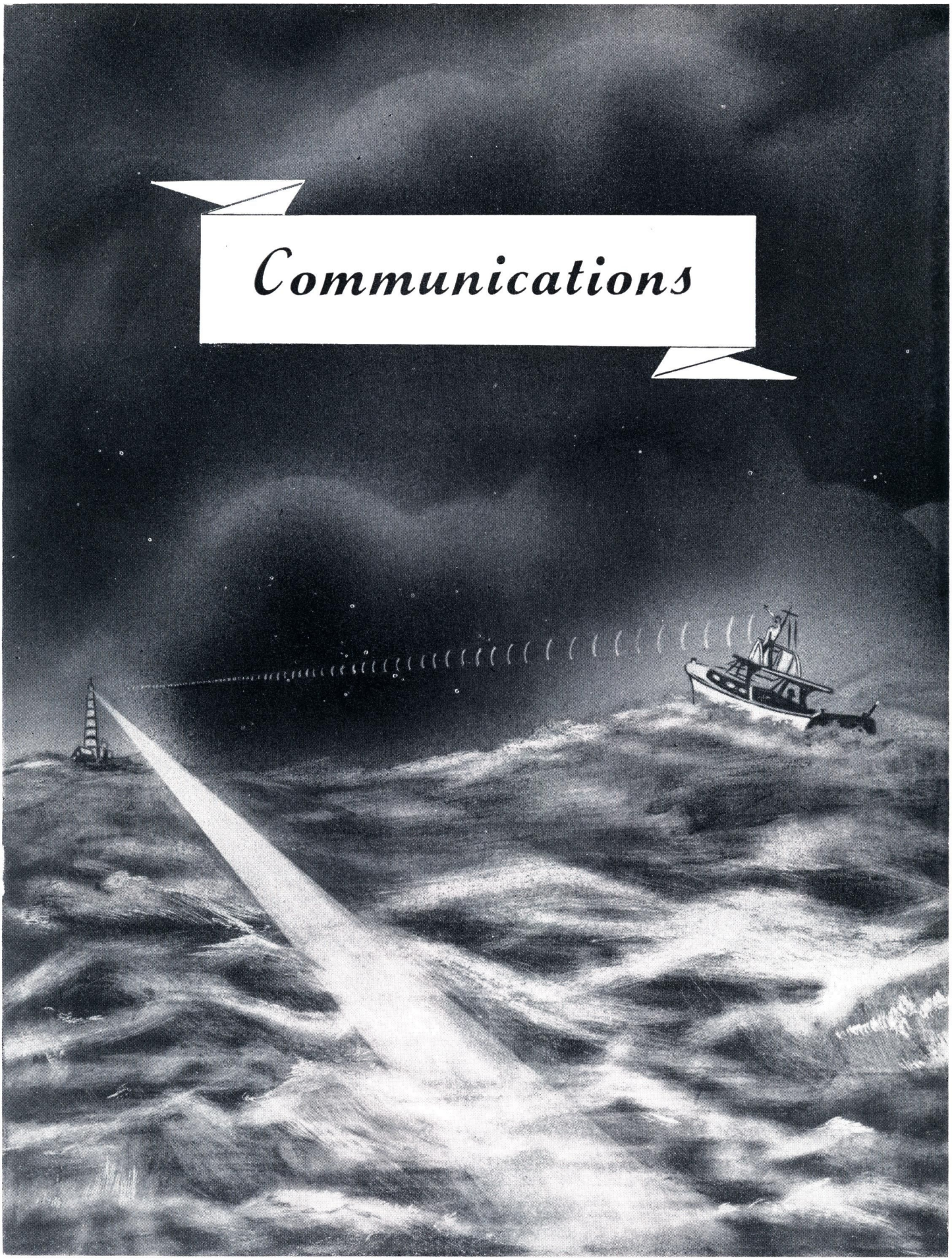
*Ownership includes the New York Times, New York Herald Tribune, International News Service, United Press Associations and Time, Inc.







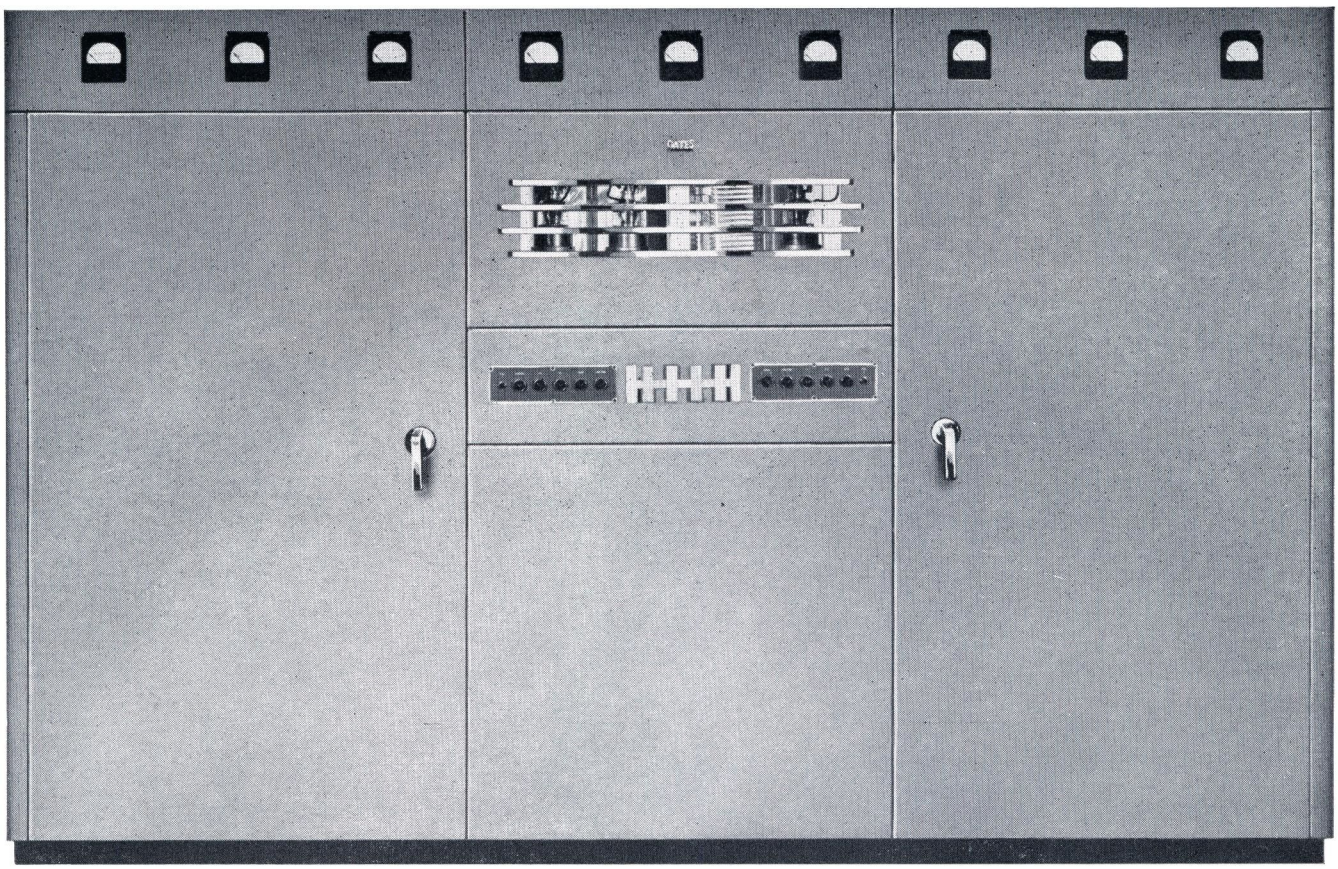
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GATES

5000/10,000 WATT 2-22 MC TRANSMITTERS



New and Modern High Frequency Transmitters for 5 kw and 10 kw, available in several models for telephone, telegraph and broadcast service.

These excellent Gates transmitters have already established an enviable reputation in both private and government communications throughout the world. — Designed to operate in world-wide climates and for the rigorous demands of continuous duty. — Available in ten models to fit all requirements of voice or broadcast quality, telegraph only, or combinations of modulated and high speed CW service.

Carrier frequency change may be made in a matter of seconds by a combination of continuously variable tuning plus "latch on" tank coil assemblies. — New tube complement means lower tube cost and longer tube life.

Every modern innovation known has been applied to the design of these fine Gates transmitting power plants. Though up to the minute in design, Gates engineers have omitted any mechanical arrangements that are difficult to service, repair or maintain. Gates HF-5 and HF-10 series high frequency transmitters are rugged, heavily built, straightforward designed equipments that will please a world-wide engineering clientele.

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GATES

5 AND 10 KW SHORT WAVE TRANSMITTERS

MODELS AVAILABLE for 5 and 10 kw service are listed on a following page. Whether the need is for voice modulation, broadcast quality, telegraph or combinations of telegraph and telephone, you will find a model exactly as required. Telegraph models will key with excellent square top wave form up to 400 WPM. Frequency shift keying is adaptable to all models.

BAND CHANGING is quick and effective. All circuits are continuously variable and tuned from the front panel—with exception of the final tank coil. The Gates "latch on" system allows fast changing of this coil and completely eliminates complicated and costly tuning mechanisms. Four final tank coils are provided (see Page 168) to cover the range from 2 to 22 megacycles. Pi-network tuning is also continuously variable.

AUDIO has four stages, with abundance of drive and modulation capacity. Broadcast models employ both modulation transformer and reactor, while voice models are equipped with the new and exclusive Gates designed Hi-cap modulation transformer. This eliminates the modulation reactor — and yet, adds to modulator efficiency at voice frequencies.

POWER SUPPLIES are generous in both size and number. Main supply is full wave, three phase, utilizing either six 8008 or 673 tubes, depending on model selected. Separate supplies are incorporated for low voltage and bias circuits.

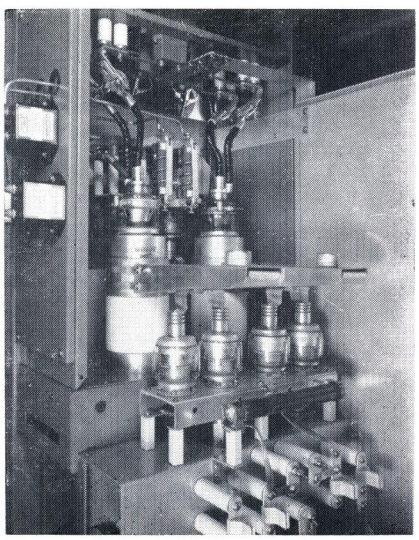
PROTECTIVE DESIGN is very complete. It includes primary circuit breakers in all major circuits and individual supervisory relays in all overload circuits such as RF driver, audio driver, final amplifier, modulator, air failure and exciter failure. Time delay, door interlock and pressure type blower air interlock protective equipment are all standard equipment.

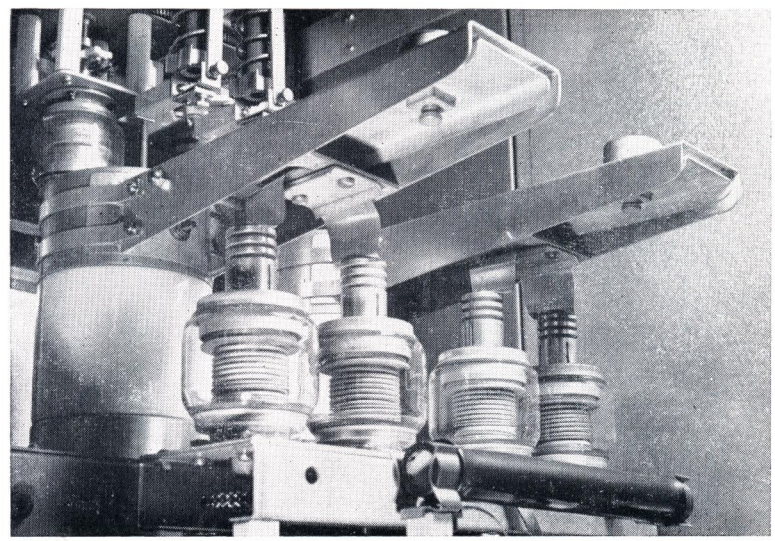
RECYCLING is part of the HF-5 and HF-10 transmitter design. If, for any reason, the carrier should go off the air, the transmitter will automatically turn itself back on four times. Thus, in case of a static discharge, such as across the transmission line, the transmitter will automatically turn back on.

COOLING is provided by one large squirrel cage blower which sends a torrent of air to the four 3X2500F3 tubes—with excess air blowing into the transmitter proper. A diaphragm air pressure switch protects the tubes against air failure, and even a clogged air filter will activate the diaphragm pressure switch. An additional small blower feeds a small stream of air on the base of each high voltage mercury vapor rectifer tube.

LOADING from the push-pull power amplifier is balanced and will match from 300 to 800 ohm lines. Veeder counter dials on the variable pi-network coils allow accurate logging for frequency change.

Below illustrates the RF power amplifier. Note slides extending from sockets to accommodate "latch on" tank coil assembly. Variable vacuum condensers handle final tank tuning.

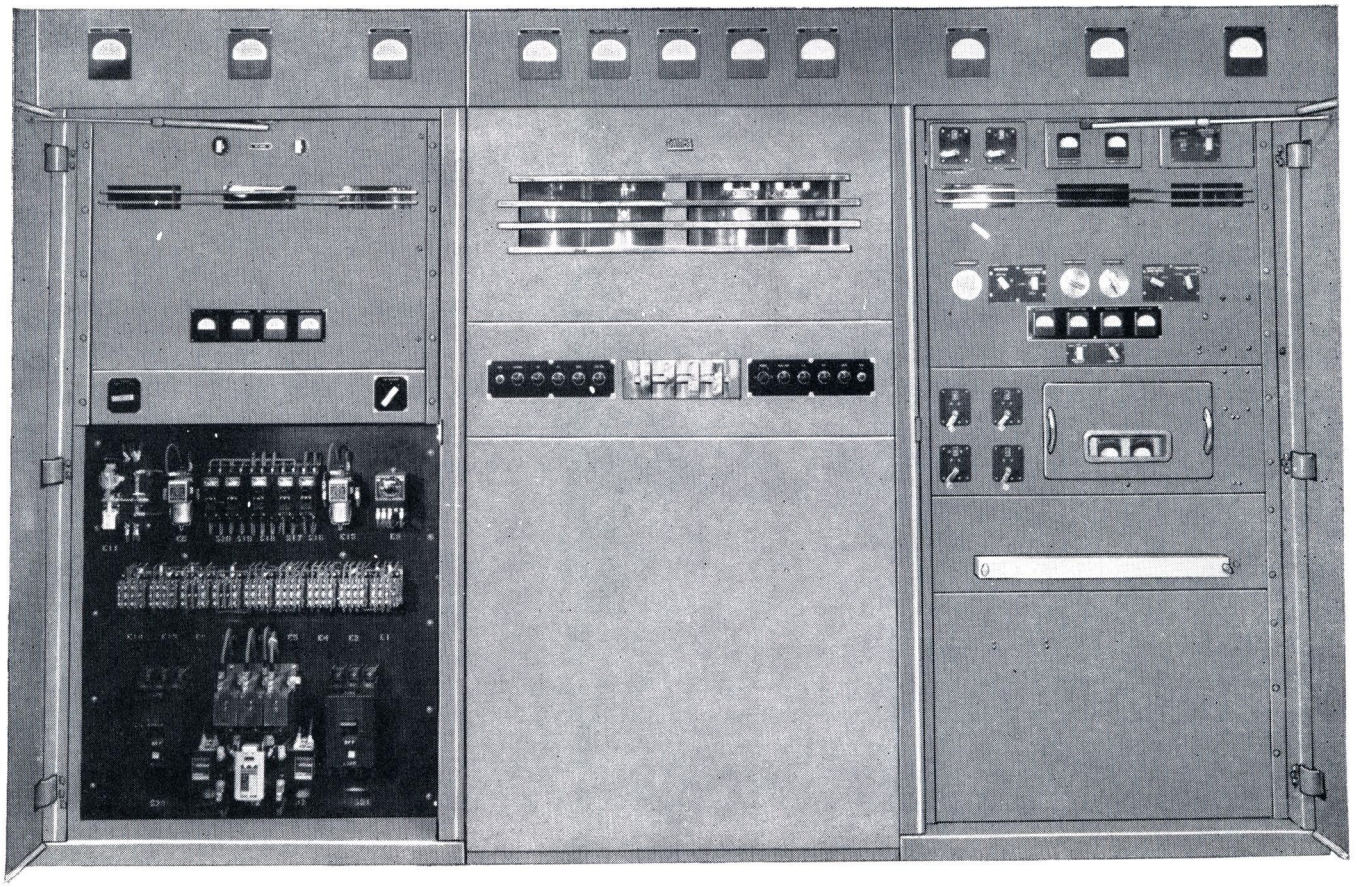




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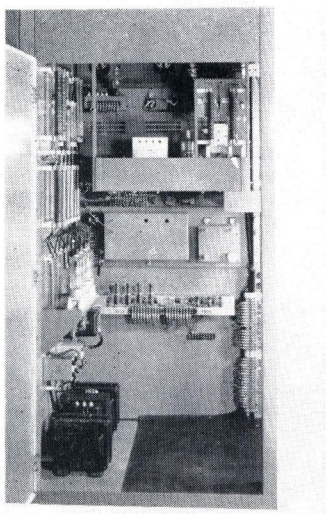
GATES

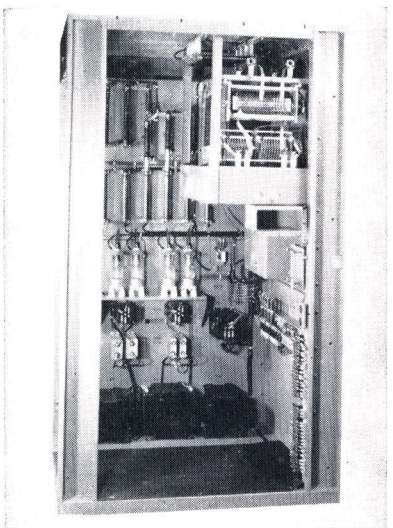
GATES 5 AND 10 KW 2-22 MC TRANSMITTERS

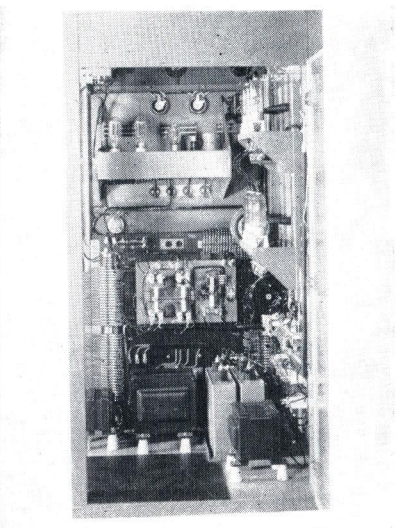


Front of Gates HF-5 and HF-10 transmitters with doors removed. Note massive relay protection to left. Transmitter is in three cubicles which bolt together. Wiring between cubicles is by jumpers between terminal boards, and time consuming "on location" cabling is eliminated.

Below: Two rear views of the left radio frequency driver cubicle, illustrating clean and roomy design. Right illustration is rear of audio/rectifier cubicle. Note predominance of ferrule resistors, and that transformers are fully cased for humidity protection. Center cubicle is illustrated on opposite page.







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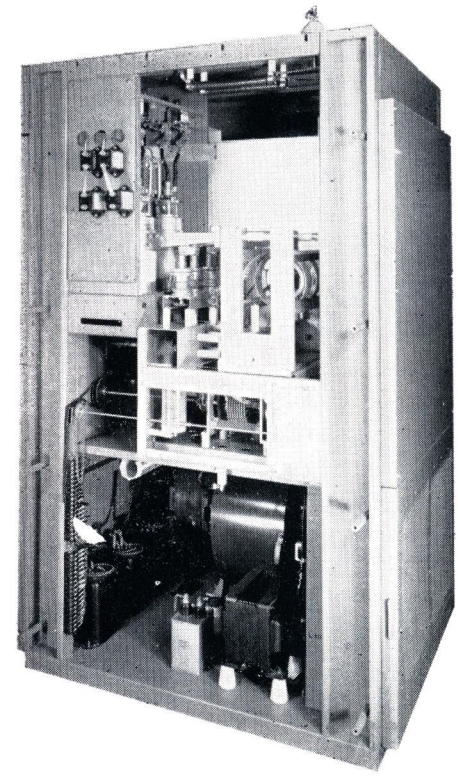
GATES

5000 AND 10,000 WATT TELEPHONE/TELEGRAPH TRANSMITTERS

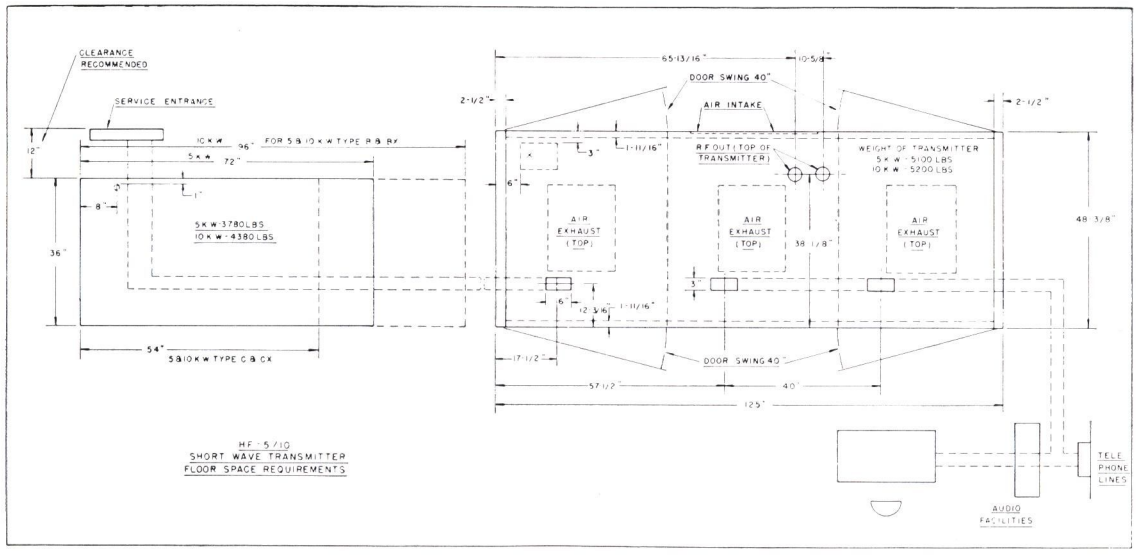
Construction

All models consist of three cubicles or cabinets which bolt together easily after unpacking. At the bottom of each cubicle are large barrier terminal strips which transfer the wiring from cubicle to cubicle, eliminating any cabling after receiving. Full size front and back doors are provided for the two outside cubicles. Layout design is such that the attendant may walk inside the back—rubber mats are provided. Such refinements as automatic internal lights that turn on when the back door is opened, and utility receptacles for drop cords or soldering iron are standard equipment.

Floor space for the three cubicles or entire transmitter is 125" wide and 49" deep, exclusive of door swing. The floor plan at bottom of page gives additional detail. Broadcast and voice models have external modulation transformer, reactor and power transformer. Telegraph models have the power transformer self-contained in the left cubicle. Heavy cold rolled furniture steel, both resistance and seam welded, with more than ample re-enforcing, is fabricated into the elaborate cabinet section of these Gates transmitting plants. Cabinet is prime coated, then hot sprayed, after which it is hand rubbed. Standard color is gray. All hardware is in chrome, nickel or natural brushed aluminum. Design meets regulations of all countries under the heading of "good engineering practice."



This unusual illustration of the center cubicle shows RF power amplifier with "latch on" tank coil in place, and variable pi-network coils underneath. Note large blower at bottom with double air intake filters.

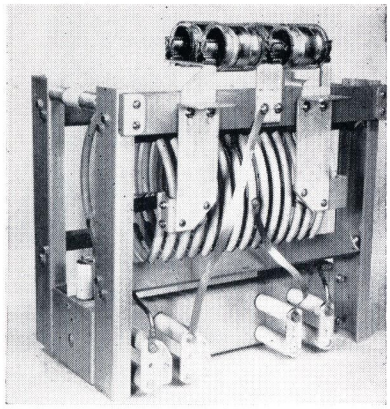


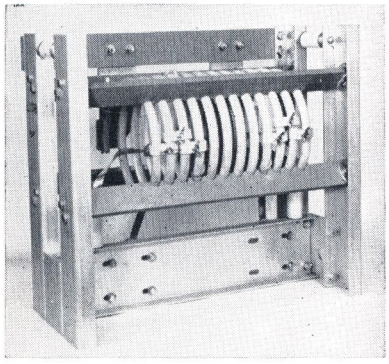
Floor plan shows location and size of transmitter and external modulator/power components, where used in voice models. External components may also be mounted in basement or in out-building if desired.

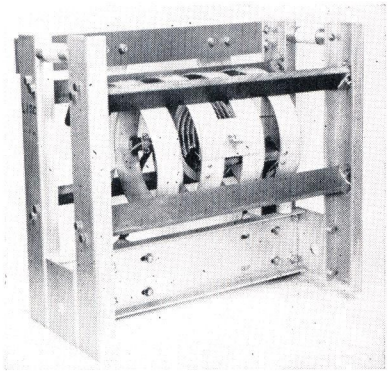
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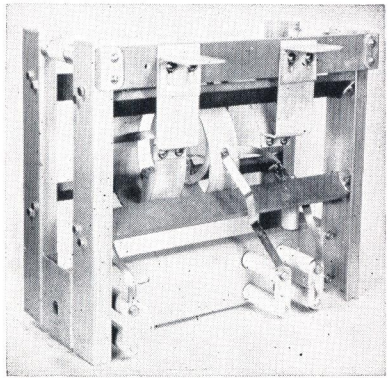
GATES

HIGH FREQUENCY TRANSMITTERS, 5 AND 10 KW









Ten Models To Select From —

HF-5B, a 5000 watt high frequency broadcast transmitter employing high level modulation, operating from 2-22 mc with uniform audio frequency response within 2 db from 30 to 10,000 cycles. Employs 3X2500F3 tubes as power amplifiers and Class B modulators, providing both better performance and economy in tube cost.

HF-10B, identical in all respects to the HF-5B but providing 10,000 watts output from 2-22 mc with high level modulation and uniform audio frequency response within 2 db between 30 and 10,000 cycles. For international radio broadcasting at high frequencies, no finer 10,000 watt equipment has ever been constructed. Uses the famous 3X2500F3 tubes with thoriated tungsten filaments in both power amplifier and modulator sockets.

HF-5BX, the same transmitter as the HF-5B, for high frequency international broadcasting but has high speed keyer added so transmitter may be utilized for both high quality telephone and high speed telegraph service.

HF-10BX, a 10,000 watt radio transmitter identical to the HF-10B but having added a high speed electronic keyer, providing a high quality 10,000 watt telephone and telegraph transmitter for use between 2-22mc.

HF-5C. a telephone type communications transmitter similar in all respects to the HF-5B but with the audio frequency portion designed for communications service only. This allows elimination of the modulation reactor and other alterations in audio frequency components, providing economies where only voice communications will be employed and the wide frequency response and extremely low distortion content of the HF-5B is not necessary.

HF-10C, a 10,000 watt communications type telephone transmitter with its audio components designed for voice quality transmission only, and in other respects identical to the HF-10B transmitter. For international telephone communications no finer 10,000 watt radio transmitter has ever been constructed.

HF-5CX, an identical transmitter to the HF-5C but with high speed electronic keyer added, providing telephone and telegraph transmission.

HF-10CX, an identical transmitter to the HF-10C but with high speed electronic keyer added and providing a 10 kw telephone and telegraph transmitter.

HF-5TX, a 5000 watt telegraph transmitter only with high speed electronic keying up to 600 WPM.

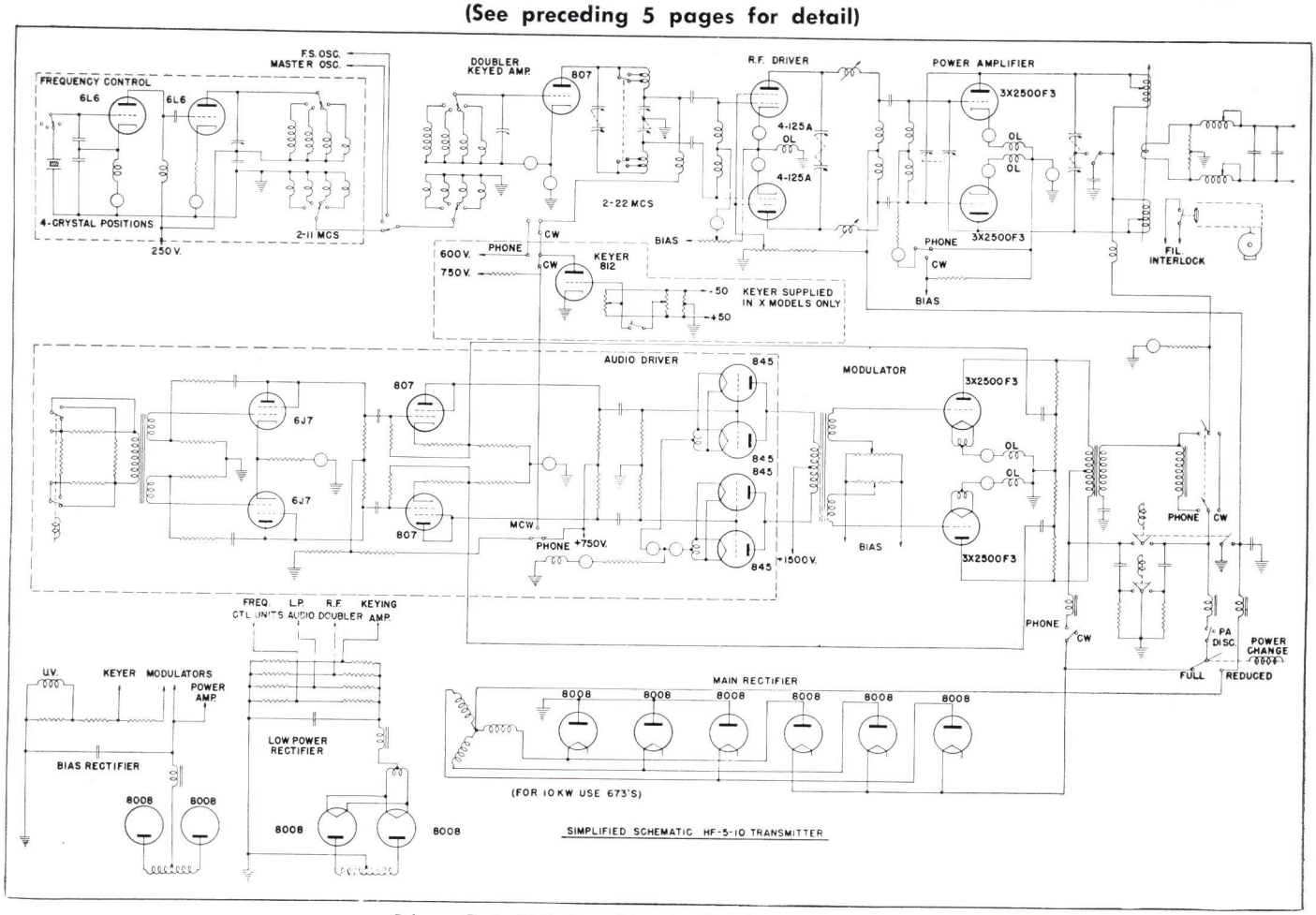
HF-10TX, a telegraph transmitter producing 10 kw power over a wide band of frequencies between 2-22 mc. The high speed electronic keyer is part of the equipment.

To left is the set of four "latch on" tank coils which cover the entire range from 2 to 22 megacycles. These coils slip into place almost instantly, and latch down with two large knurled screws, completely eliminating complicated and costly tuning mechanisms.

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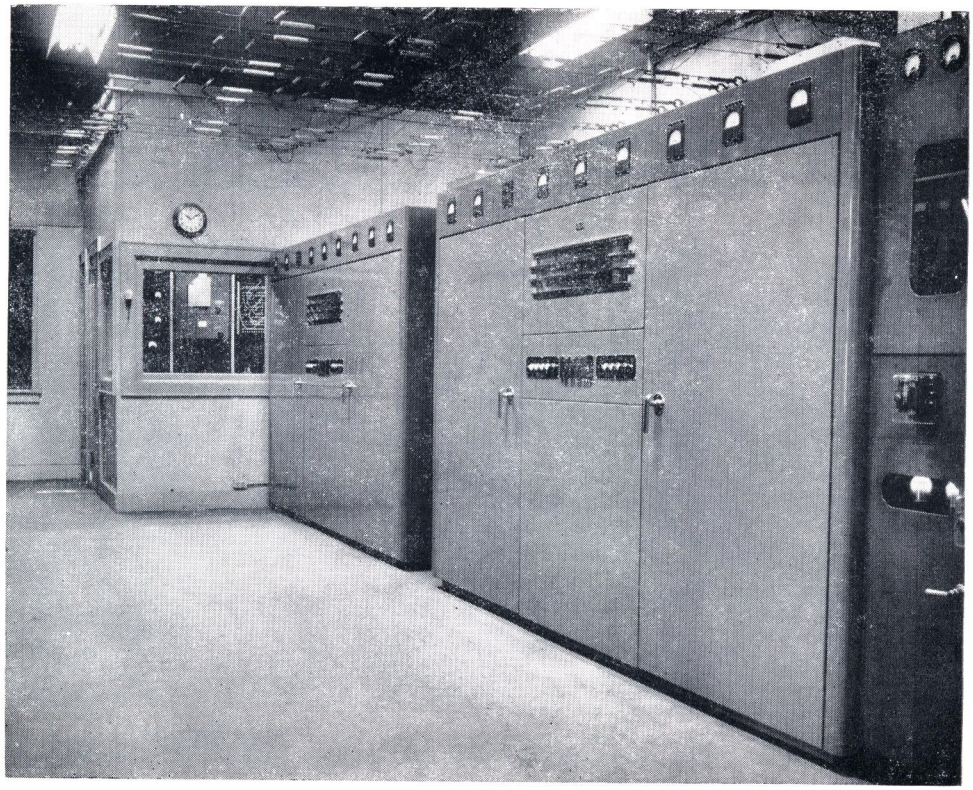
GATES HF-5 AND HF-10 SHORT WAVE TRANSMITTERS

(See preceding 5 pages for detail)



SIMPLIFIED SCHEMATIC HF-5-10 TRANSMITTER

Below: Dual HF-10 transmitters installed for overseas service.



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GATES

5 AND 10 KW TELEPHONE, TELEGRAPH AND BROADCAST
(2-22 MC Transmitters)

SPECIFICATIONS

TUBES (all models): One 812; Two each 6L6, 4-125A, 6J7. Three each 807. Four each 845; 3X2500F3; Ten each 8008.

Note—In 10 kw model, six type 673 replace six type 8008 in main rectifier. In telegraph model, delete two each 6J7, 807, 3X2500F3, and four 845. Where keyer not employed, delete 812.

METERING: Individual meters provided for: Oscillator plate, First Int. Amp. Plate, Second Int. Amp. Grid, Second Int. Amp. Plate, Third Int. Amp. Grid, Third Int. Amp. Plates (2 meters), Power Amp. Grid, Power Amp. Plates (2 meters), First Audio Plates, Second Audio Plates, Third Audio Plates (2 meters), Modulator Plates (2 meters), Filament Volts, Plate Volts. (Telegraph models have audio meters omitted.)

FREQUENCY RANGE: 2-22 mc.

POWER OUTPUT: Model HF-5 (all models), 5000 watts carrier.
Model HF-10 (all models), 10,000 watts carrier.

Note—Under certain circumstances power output above 18 mc will be slightly lower.

OUTPUT IMPEDANCE: 300-800 ohms balanced.

FREQUENCY STABILITY: 0.005%.

CRYSTAL POSITIONS: 4 (additional crystal provisions available on special order).

AUDIO INPUT: 600 ohms; plus 14 dbm for 5 kw; plus 17 dbm for 10 kw.

FREQUENCY RESPONSE: Plus or minus 1.5 db, 30-10,000 cycles broadcast model; Plus or minus 3 db, 150-4000 cycles communications model.

DISTORTION: 3% or less all frequencies between 50 and 7500 cycles for broadcast model; 10% or less between frequencies of 150 and 4000 cycles for communications model.

NOISE: 60 db or better below 100% modulation, broadcast model; 45 db or better below 100% modulation, communications model.

POWER CONSUMPTION AT 100% MODULATION: HF-5B, HF-5BX, HF-5C, HF-5CX, approximately 19.5 kw. HF-10B, HF-10BX, HF-10C, HF-10CX, approximately 31 kw. HF-5TX, approximately 10 kw. HF-10TX, approximately 20 kw.

KEYING SPEED: 400 WPM with pure square top wave form. Higher practical keying speeds up to 600 WPM easily possible.

SIZE: 125" long, 78" high, 49" deep, with door swing front and back doors 40". Size of largest cubicle 51" wide, 56" deep, 80" high. Space required for external transformers, where used, 36" wide, 72" long, 36" high.

NET WEIGHT: 5 kw telephone models, 9,600 lbs.
10 kw telephone models, 12,000 lbs.

CROSS WEIGHT: 5 kw telephone models, 13,900 lbs.
10 kw telephone models, 15,100 lbs.

CUBAGE: 5 kw models, 317 cu. ft.; 10 kw models, 342 cu ft.

ORDERING NOMENCLATURE
By Catalog Number

MODEL HF-5B complete 5 kw broadcast model, high frequency transmitter with complete coil set 2-22 mc, one set of tubes, less crystals and ovens.

MODEL HF-10B complete 10 kw broadcast model with all coils 2-22 mc, one set of tubes, less crystals and ovens.

MODEL HF-5BX complete 5kw broadcast model, same as above but with electronic keyer added, with tubes, complete coil set 2-22 mc, less crystals and ovens.

MODEL HF-10BX complete 10 kw broadcast model with electronic keyer added, with tubes, complete coil set 2-22 mc, one set of tubes but less crystals and ovens.

MODEL HF-5C communications telephone transmitter, 5000 watts, with coil set 2-22 mc, complete set of tubes but less crystals and ovens.

MODEL HF-10C communications type telephone transmitter, 10,000 watts, with complete coil set 2-22 mc, complete set of tubes but less crystals and ovens.

MODEL HF-5CX communications telephone and telegraph transmitter, 5000 watts power, with electronic keyer, complete coil set 2-22 mc, complete set of tubes but less crystals and ovens.

MODEL HF-10CX communications telephone and telegraph transmitter, 10,000 watts power, with electronic keyer, complete coil set 2-22 mc, complete set of tubes but less crystals and ovens.

MODEL HF-5TX telegraph transmitter only, 5000 watts, with complete coil set 2-22 mc, high speed electronic keyer, complete set of tubes but less crystals and ovens.

MODEL HF-10TX telegraph transmitter only, 10,000 watts, with complete coil set 2-22 mc, complete set of tubes but less crystals and ovens.

MODEL HFXT-1 crystal and oven ready to use with any of above transmitters. Specify carrier frequency desired when ordering.

MODEL HFTSB-5 complete 100% tube set for 5 kw telephone models.

MODEL HFTSB-10 complete 100% tube set for 10 kw telephone models

MODEL HFTSX-5 complete 100% tube set for 5 kw telegraph models.

MODEL HFTSX-10 complete 100% tube set for 10 kw telegraph models.

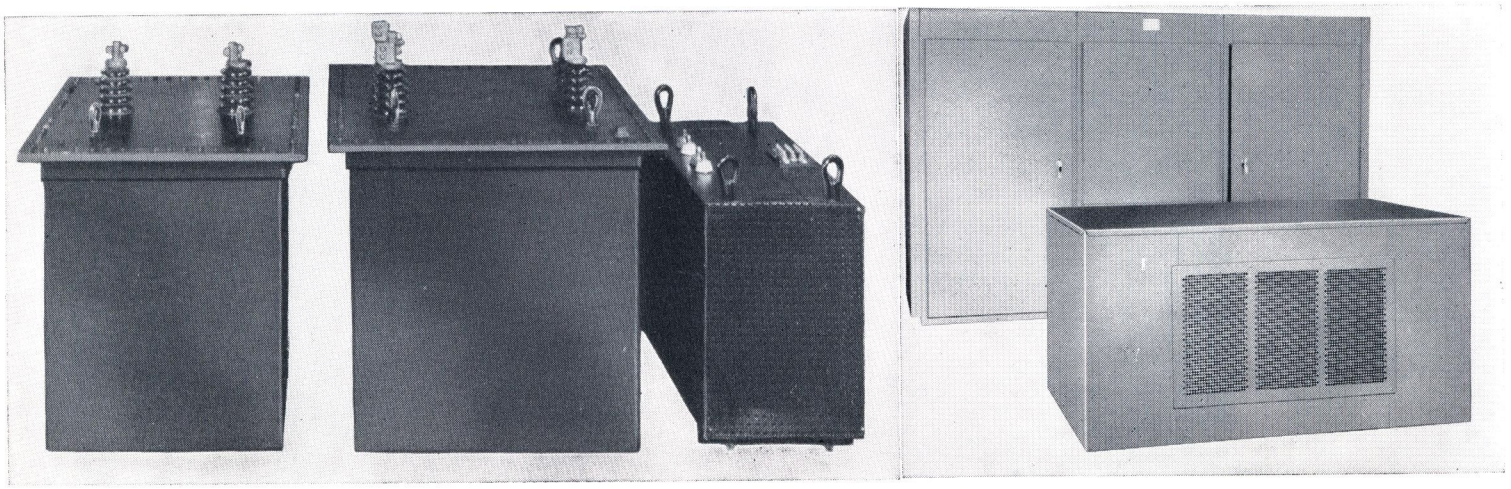
MODEL HFK tube set for electronic keyer.

ORDERING INFORMATION

When ordering please give every detail possible, such as operating frequency or frequencies, line impedance, power line frequency and altitude of installation. Transmitters are normally carried in stock. When ordering do not overlook spare tubes and crystals, if these are desired. Both equipment and base spare parts lists will be supplied for your selection on request.

SPECIAL MODELS

Gates engineers have endeavored to incorporate in these transmitters every engineering achievement you might desire. It is recognized that various primary voltages and frequencies exist in different parts of the world. Also, slight modifications to the standard specifications may be required in certain instances. If this is necessary, the modifications will be included for a modest increase in price.

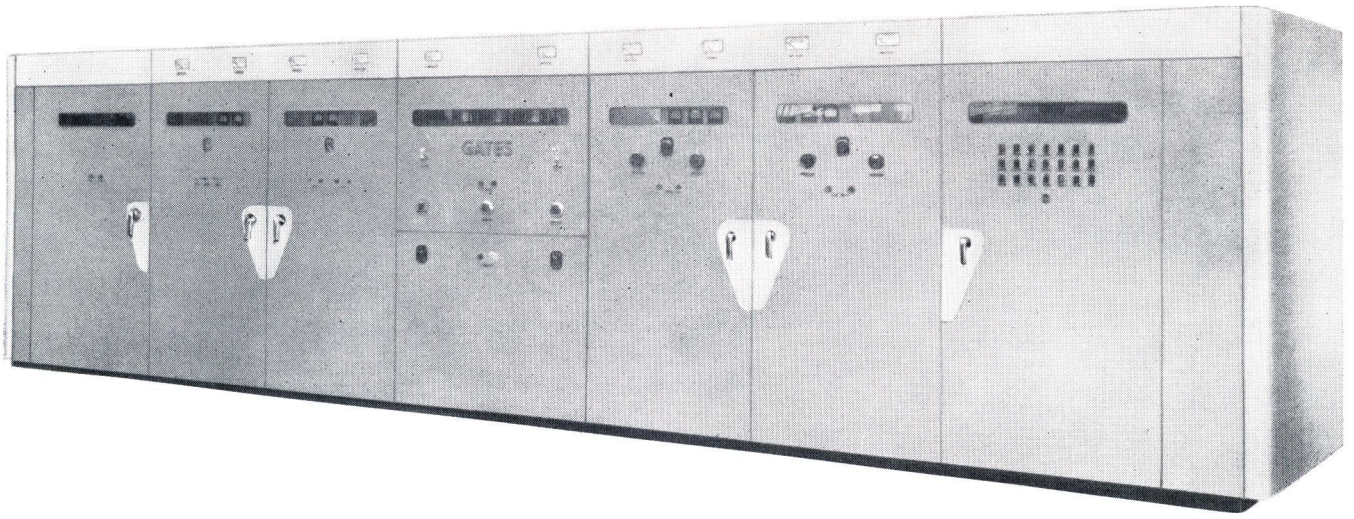


Above is a typical set of external components for the HF-5B or HF-5BX transmitter.
Where desired, an enclosure may be obtained to cover these components, as illustrated at the right.

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GATES

50 KW AND 100 KW HIGH FREQUENCY TRANSMITTERS



Gates manufactures on special order and with excellent delivery, transmitters of 50,000 and 100,000 watts power for many modes of operation. Most popular are the high level short wave broadcast models for operation on either specific frequencies between 4 and 20 megacycles or they are available for continuous frequency coverage between 4 and 20 Mc.

These transmitters are available for frequency shift keying or high speed electronic keying and may also be had in voice models with peaked audio in place of the broadcast quality models with wide frequency response.

Though there are some variances by reason of the radio frequency range being at higher frequencies, the general description of models BC-50B and BC-10B, listed on Pages 4 and 17 of this catalog, will provide excellent detail as to the general construction, rugged design and the adaptability to the most exacting commercial service.

Gates engineers will be happy to work with prospective users of these high powered transmitters in planning the system requirements in line with maximum results.

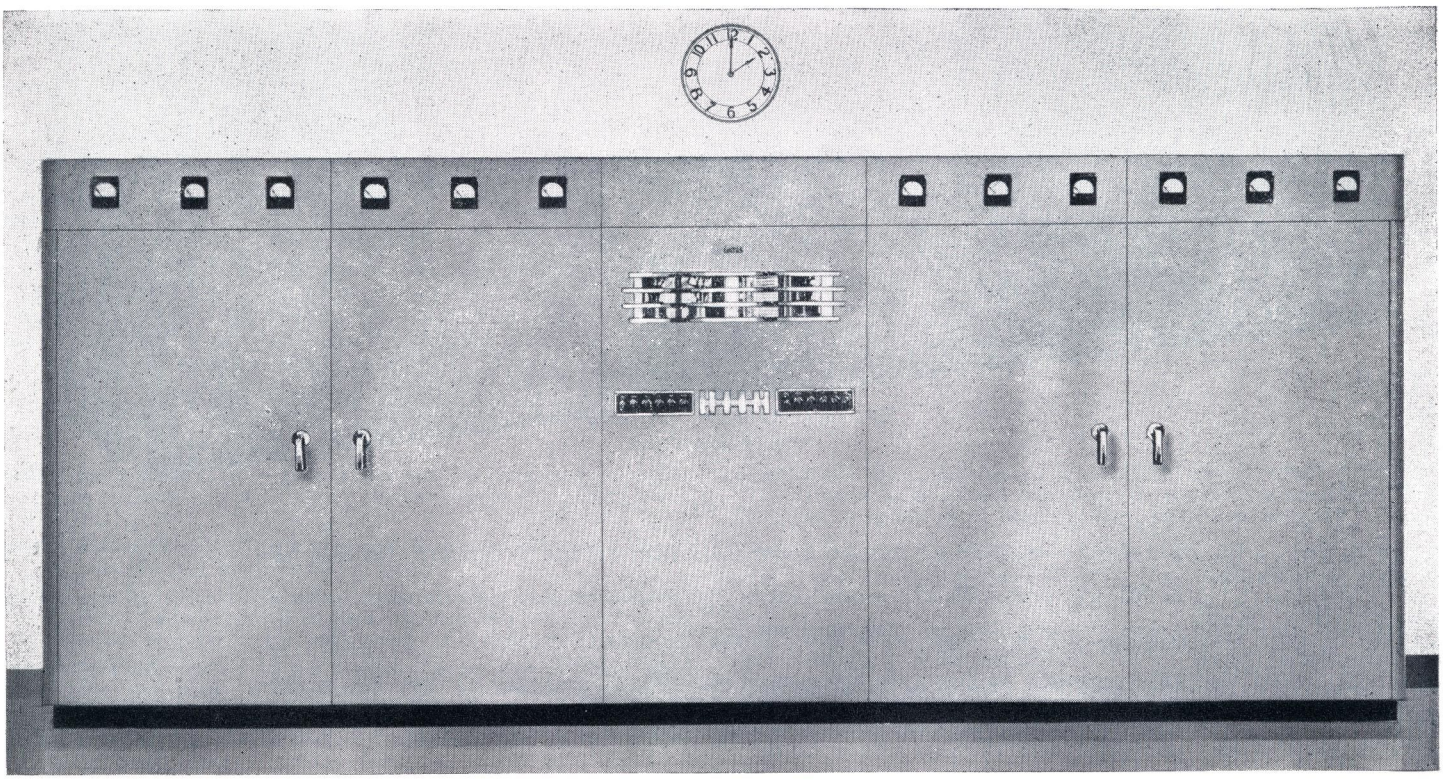
As prices are based on frequency or frequencies of operation as well as the mode of audio quality desired, it is recommended that information in this respect be provided to Gates and complete prices and specifications will be speedily supplied.

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GATES

HF-20 HIGH FREQUENCY TRANSMITTERS

(20,000 Watts 4-22 Mc)



Frequently referred to as **the work horse** of the international communications and broadcast high frequency bands, this series of Gates high power transmitters covers the entire frequency range between 4 and 22 Mc. — An additional set of frequency determining components is available where frequencies down to 2 Mc are desired.

Three models are available as follows:

Model HF-20B: High frequency, high fidelity broadcast transmitter, 4-22Mc.

Model HF-20BX: High frequency broadcast or telephone transmitter, 4-22 Mc, with electronic keying and provision for frequency shift keying.

Model HF-20TX: High frequency telegraph transmitter, 4-22 Mc, with electronic keying and provision for frequency shift keying.

All modulated models appear as above. The telegraph model has four cubicles or sections, instead of five, as the modulator is omitted. Further complete detail is found on the succeeding pages.

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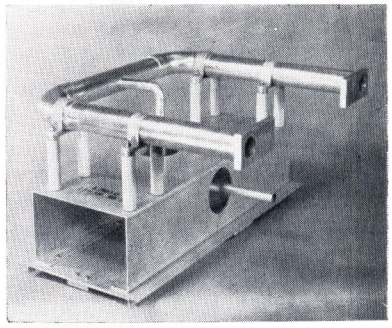
HF-20 HIGH FREQUENCY 20 KW

RADIO FREQUENCY SECTION: Five RF stages are headed by a detachable "oscillator—1st IPA" unit. Positions for four crystals are switch selectable. All crystals are temperature controlled for 0.005% accuracy. Attachment of frequency shift keyer or external VFO is provided for. — All RF stages, except the final power amplifier, are self-neutralized. In the keyed models (telegraph) the 2nd IPA/doubler stage is keyed electronically (see keyer). RF drive to the final is in abundance by use of pushpull 4-250A tetrodes. In the final power amplifier, four 3X2500F3 tubes are operated in pushpull parallel. These famous tungsten filament tubes, pioneered in many models by Gates, are known for long life and low replacement cost.

FREQUENCY BAND COVERAGE: With exception of the final latch-on tank coil, tune-up is from the front panel or continuously variable between 4-22 Mc. This is also true in the output coupling network. The tank coil, because of the heavy design, is a special Gates latch-on design (see illustration). The various tank coils may be changed in less than a minute and coils are supplied for all 4-22 frequencies. Veeder counters reading to 1/10 RPM permit accurate logging of all tuned circuits for quick frequency change.

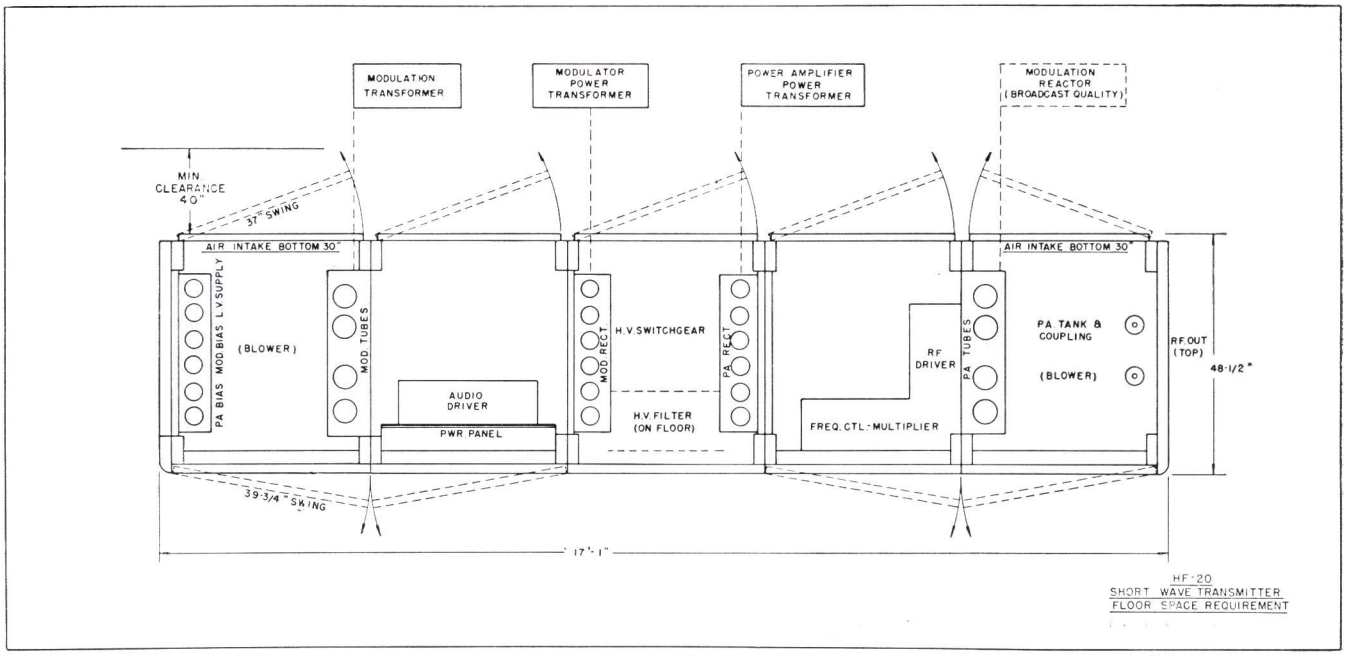
OUTPUT COUPLING: RF impedances between 300-800 ohms are matched by means of inductively coupling to the PA tank and feeding a balanced matching network having series variable coils and parallel variable vacuum capacitors. Both variable coils and capacitors have counter type tuning controls for accurate logging.

AUDIO SECTION: All modulated models have a superb audio system consisting of four, all pushpull, stages. Modulators are four pushpull 3X3000A3 tubes. Though drive requirements to these tubes are low, Gates engineers developed a unique and highly effective coupling transformer to greatly add to performance. Overall feedback is employed as an adjunct to excellent possible performance without feedback.



Latch-on 22 Mc tank coil assembly. High speed changing of tank coils makes overall frequency change possible in less than sixty seconds.

Floor plan of BC-20B and HF-20B transmitter. Telegraph model has four cubicles or sections, reducing width by 20%. External transformers may be indoor or outdoor mounted.



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GATES

HF-20 HIGH FREQUENCY 20 KW

METERING: There are no multi-meters. Few transmitters are so well complemented with meters, 29 in all. Individual current meters will be found in each power tube, modulator tube and audio driver tube cathode. This feature permits instant checking of important tubes without switching and is indispensable in daily operation and maintenance.

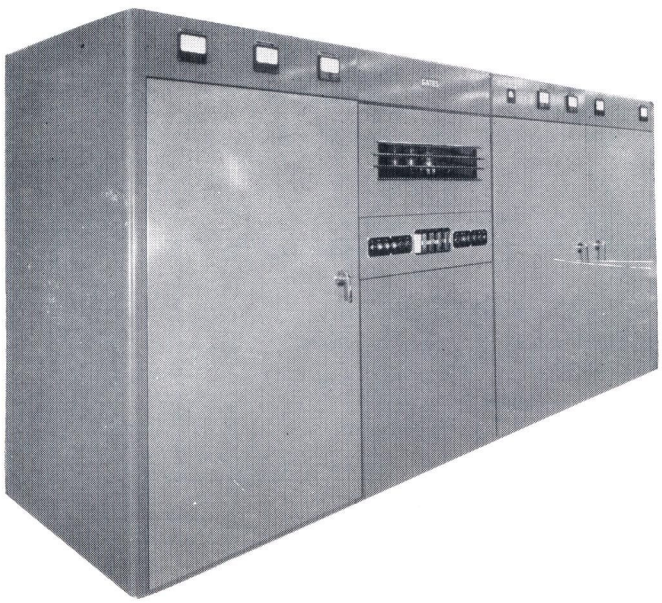
KEYING: In all keyed models an electronic keyer operates in conjunction with the 6146 IPA/doubler stage. An 812A tube is so bias that when the key is closed, no current is drawn. Keying up to 400 WPM with good square top wave form, is obtained.

POWER SUPPLIES: Five major power supplies deliver plate and bias voltage to the HF-20 transmitter. Featured are the two complete high voltage supplies. One is used for the radio frequency power amplifier and the other for the modulators. The resulting almost perfect regulation is quickly recognized by the engineer. Likewise, in case of failure of one power supply, the remaining one can be bused in, operating the transmitter on reduced power until repairs are made. Each of these power supplies are full wave, three phase, six tube supplies. Other individual supplies provide modulator bias voltage, power amplifier bias voltage and intermediate voltage for driver stages. The telegraph model has only one HV power supply as the modulator is omitted.

RELAYS AND PROTECTION: Gates engineers have provided protection to the point that no power consuming circuit of importance has been overlooked. Primary thermal breakers are inserted in all main primary lines. Individual supervisory overload relays are incorporated for, not only the transmitter main overload, but also for separate protection; exciter failure, air failure, RF driver, power amplifier, audio driver and modulators. Included are secondary relays for door interlock and air cooling interlock. Automatic condenser discharge relay switch immediately discharges the main filter capacitors when the door interlocks are disengaged.

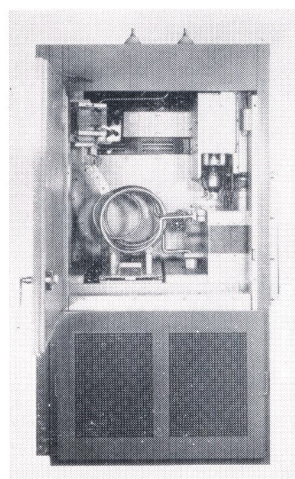
RECYCLING: Automatic recycling relay controls automatically where the carrier is disrupted, and attempts to reset the carrier four times before remaining off. Many times carrier interruption is caused by static discharges across the transmission line or tower base and this recycling feature is indispensable.

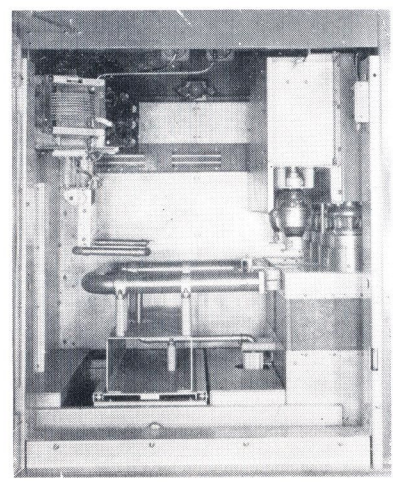
PERFORMANCE: Everything has been done to assure the HF-20 series of transmitters to be the finest. The long list of users includes major governments world-wide as well as important private industrial accounts. HF-20 is definitely commercial all the way. Whether used 24 hours daily or in a remote equatorial climate with temperature and humidity high, performance and reliability can be expected.



Above, the HF-20TX telegraph model. In the 20 KW telegraph model the modulator cubicle is omitted, reducing width. Modulator may be added at any future date.

These two views excellently illustrate the tank-output coupling section and the "latch-on" tank coil. Right photo has 15 Mc tank and left, 22 Mc tank.





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GATES

HF-20 SPECIFICATIONS

ELECTRICAL

FREQUENCY RANGE: 4-22 Mc as supplied. Frequency determining kit for 2-4 Mc available where required.

OUTPUT IMPEDANCE: 300-800 ohms balanced. Where 50 ohms unbalanced, so state when ordering.

POWER OUTPUT: 4-18 Mc, 20,000 watts.
18-22 Mc, 16,000 watts.

POWER REDUCTION: Low power tune-up switch provided.

POWER INPUT: 0 modulation or telegraph, 37 KW.
Average modulation, 43 KW.
100% modulation (sine wave), 55 KW.

PRIMARY VOLTAGE: 230 volts, 3 phase, 50 cycles. If 60 cycles desired, state when ordering. Other primary voltages available on special order.

AUDIO RESPONSE*: ±1½ db 50-10,000 cycles.

DISTORTION*: 4% or less 50-7500 cycles.

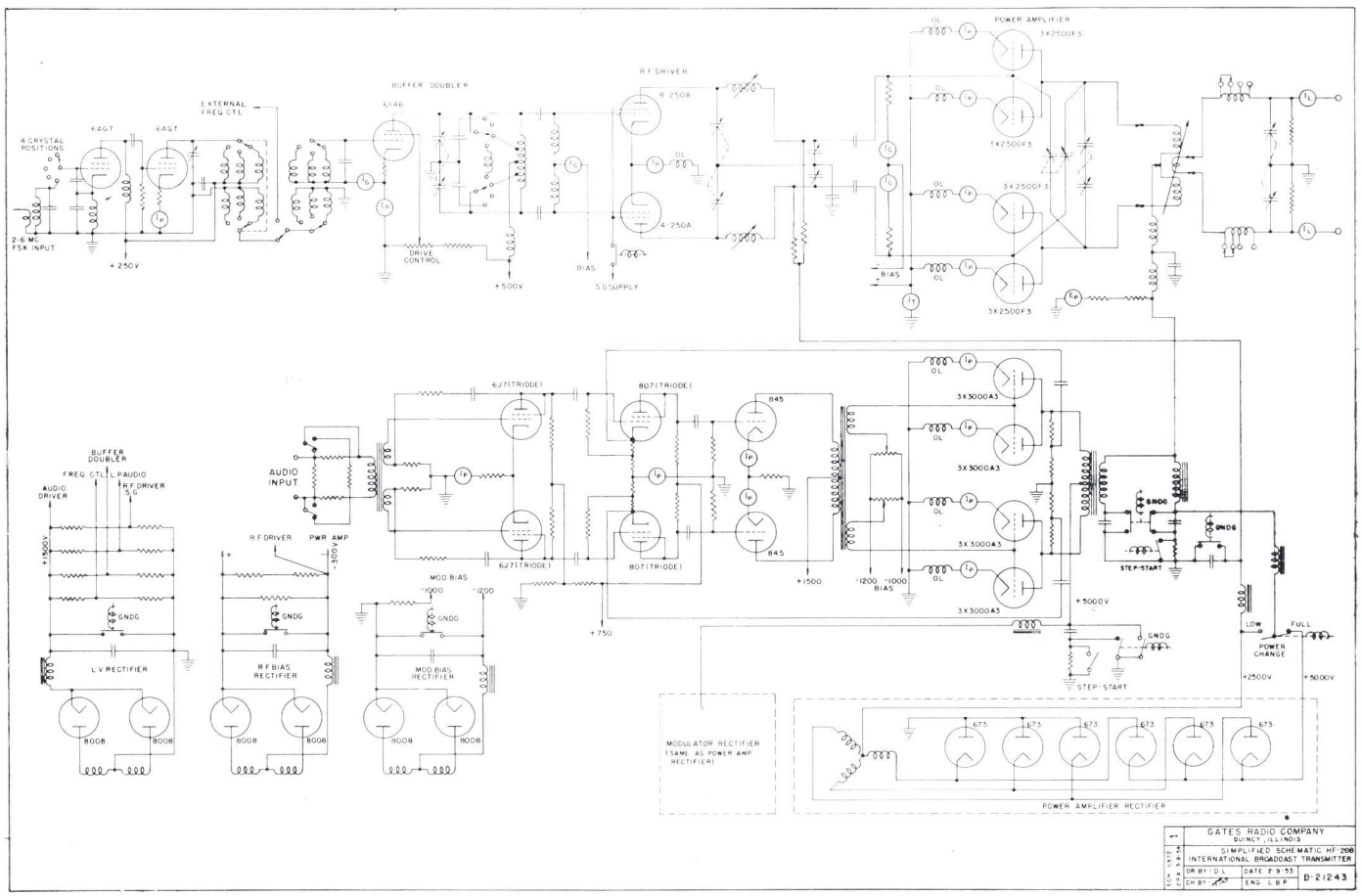
NOISE*: 55 db below 100% modulation or better.

RF STABILITY: 0.005% or better.

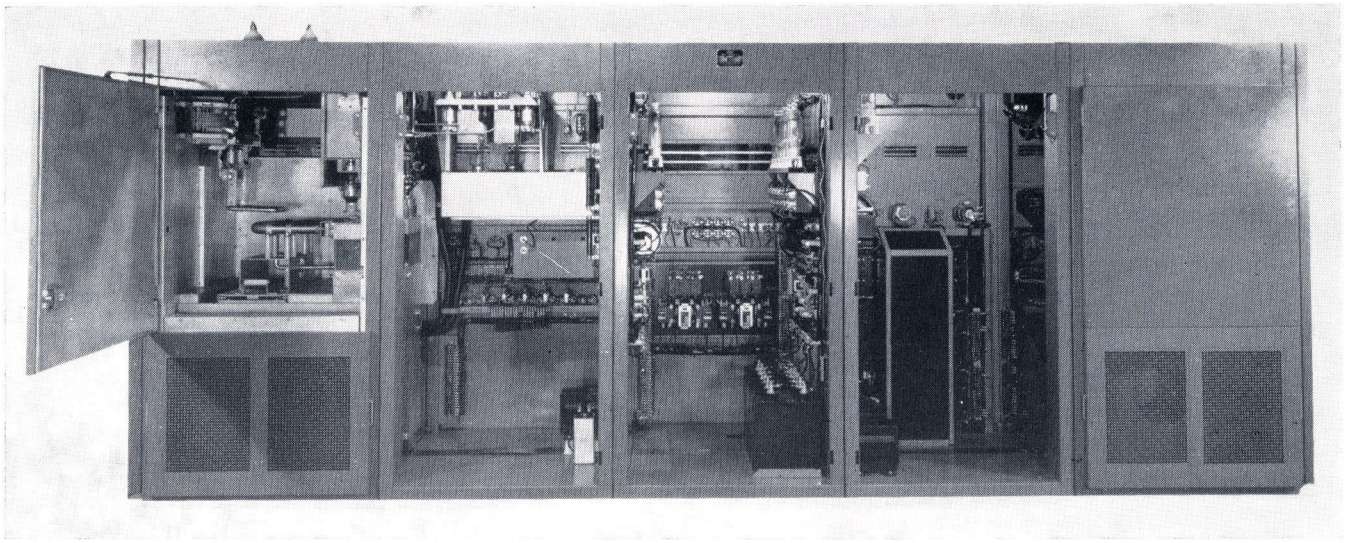
KEYING:** 400 WPM or less.

* Modulated models only.
** HF-20BX and HF-20TX only.

Simplified wiring diagram HF-20B transmitter. For Model HF-20TX audio section and one HV power supply drop out.



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Rear HF-20B and HF-20BX transmitters with rear doors removed.

ELECTRICAL SPECIFICATIONS
(continued)

TUBES:

Radio Frequency Section
- 6A67 oscillator
- 6AQ7 1st IPA
- 6146 2nd IPA
- (2) 4-250A 3rd IPA
- (4) 3X2500F3 power amplifiers

Audio Section
- (2) 6J7 1st audio
- (2) 807 2nd audio
- (2) 845 3rd audio
- (4) 3X3000A3 modulators

Power Supplies
- (12) 673 HV rectifiers
- (4) 8008 LV rectifiers
- (2) 866A LV rectifiers

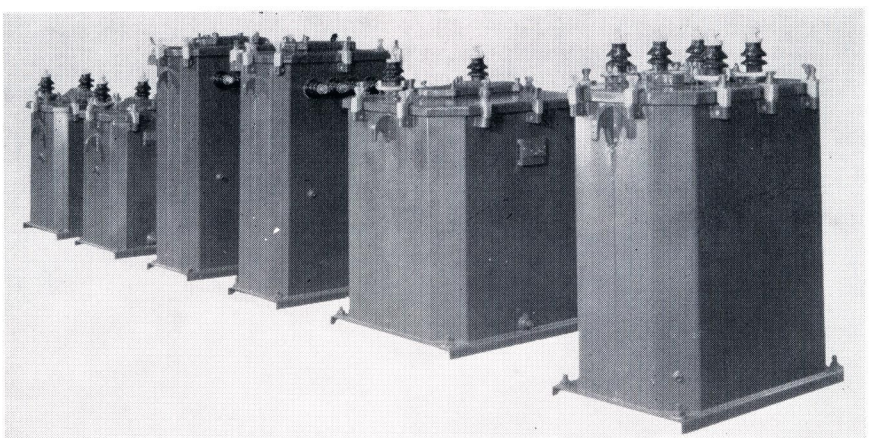
Keyer
- (1) 812 keyer tube*

Total tubes: 37
Total tube types: 11

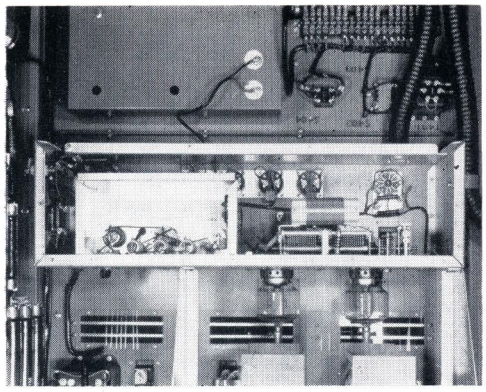
* Modulated models only.

METERS:
- RF output (2) meters
- Plate volts
- Filament volts
- Line volts
- 1st IPA cathode
- 2nd IPA grid
- 2nd IPA plate
- 3rd IPA grid
- 3rd IPA cathode
- PA grid (2 meters)
- PA plate (4 meters)
- 1st audio cathode
- 2nd audio cathode
- 3rd audio cathode (2 meters)
- Modulators (4 meters)

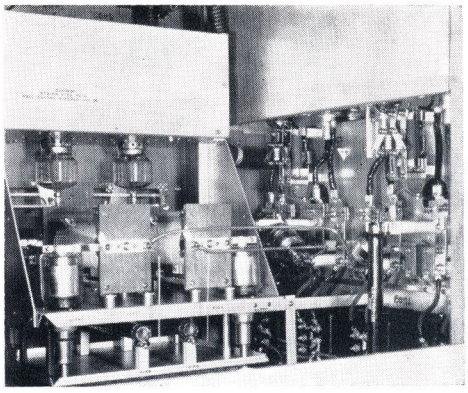
External heavy oil filled transformers may be indoor or outdoor installed.



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Two rear views of RF driver section of the HF-20 series transmitters. This and all earlier stages are continuously variable.



MECHANICAL

SIZE: HF-20B and HF-20BX, 210" wide, 49" deep, 78" high. Door swing, 40" front and rear. Floor space external units, 10'x2½'.

HF-20TX, 175" wide, 49" deep, 78" high. Door swing, 40" front and rear. Floor space external units, 4'x2½'.

WEIGHT: HF-20B and HF-20BX — 23,000 lbs. packed, 19,000 lbs. net.
HF-20TX — 16,000 lbs. packed, 12,900 lbs. net.

CUBAGE: HF-20B and HF-20BX — 720 cu. ft.
HF-20TX — 470 cu. ft.

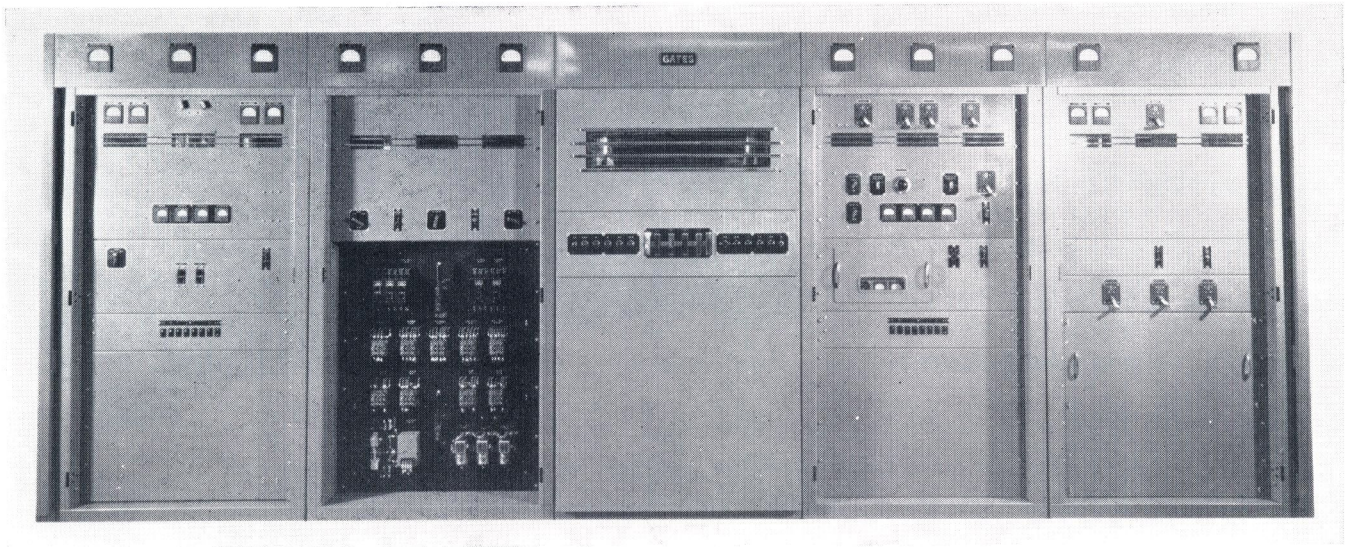
EQUIPMENT SUPPLIED AS STANDARD

1 Complete transmitter, type as ordered.
1 100% set of tubes.
2 Instruction Books.

ORDERING INFORMATION

High frequency, high fidelity broadcast transmitter, 4-22 Mc	**HF-20B**
High frequency, high fidelity transmitter with 400 WPM keyer	**HF-20BX**
High frequency telegraph transmitter	**HF-20TX**
Crystal and holder (state frequency)	**JKO3, H-17**
Spare 100% tube complement for HF-20B and HF-20BX transmitters	**TK-139**
Spare 100% tube complement for HF-20TX transmitter	**TK-140**

Front HF-20B and HF-20BX transmitter with front doors removed.

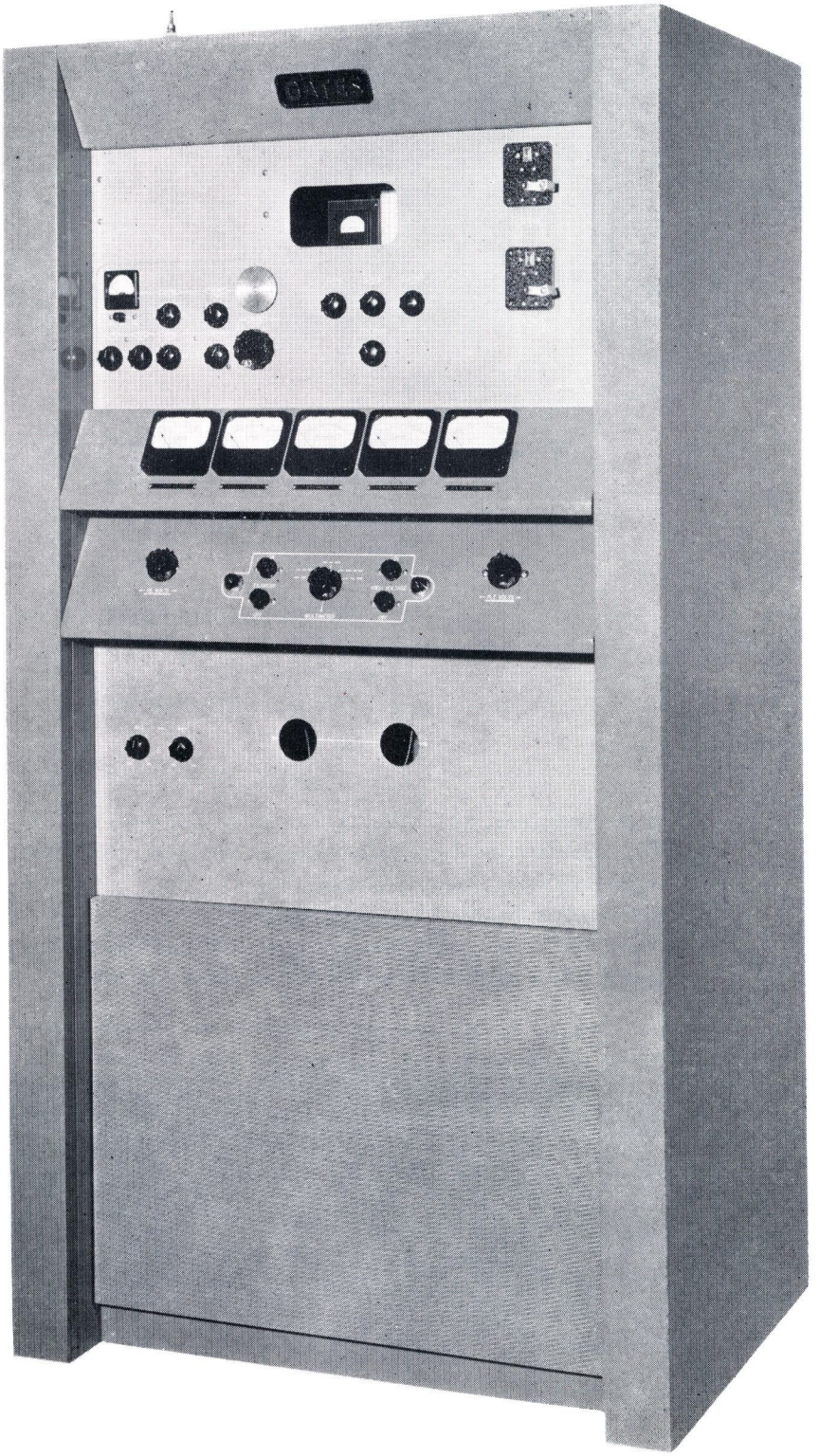


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GATES

HF-1M SHORT WAVE TRANSMITTER

Model HF-1M transmitter supplies 1000 watts output power that may be 100% modulated for either communications or broadcast. When keyed, powers in excess of 1KW output are possible.



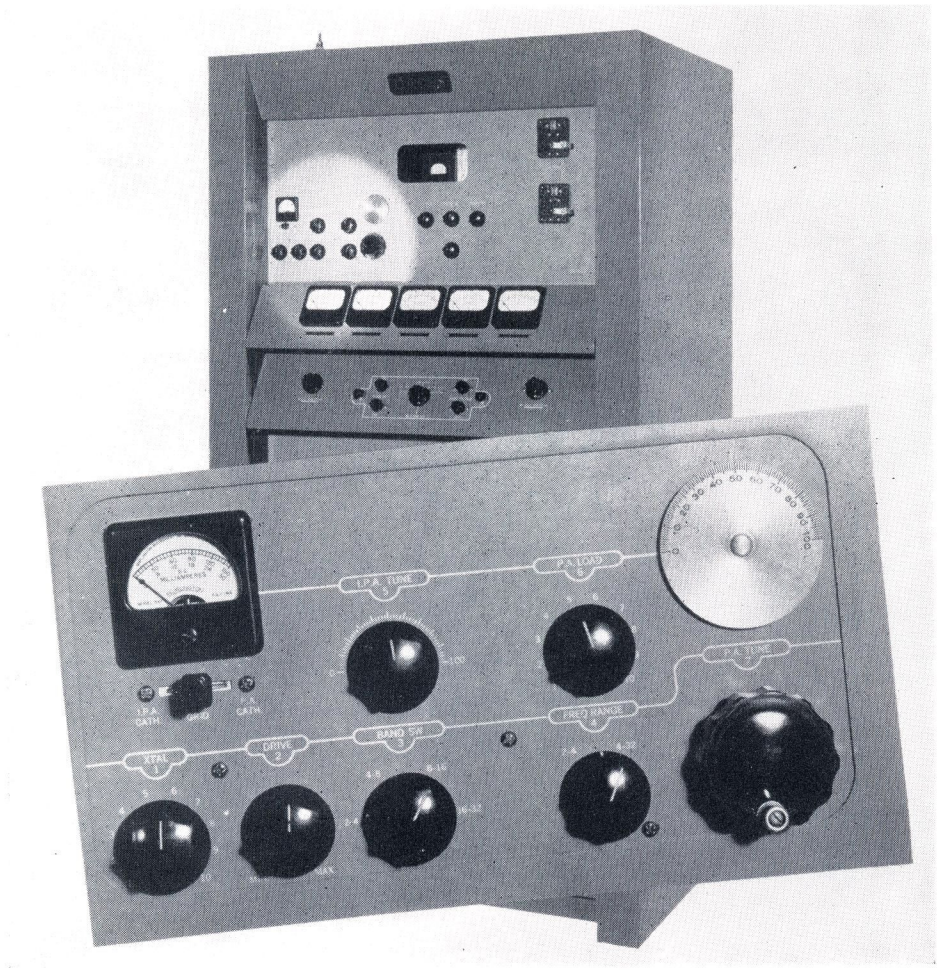
High frequency coverage between 2 and 32 Mc is continually variable from the front panel between 3-32 Mc. This means fast frequency change without changing any component, or as simple as changing dial settings.

HF-1M is an all-purpose transmitter. All modulation components are of broadcast quality. Where the wide audio range for broadcasting is not desired, the Gates limiter/filter amplifier is added for sharp voice quality. Keying up to 60 WPM manual including break-in may be augmented with an optional electronic keyer for speeds up to 400 WPM.

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HF-1M CONTINUOUSLY VARIABLE 1KW TRANSMITTER



Spotlite On the Exciter:

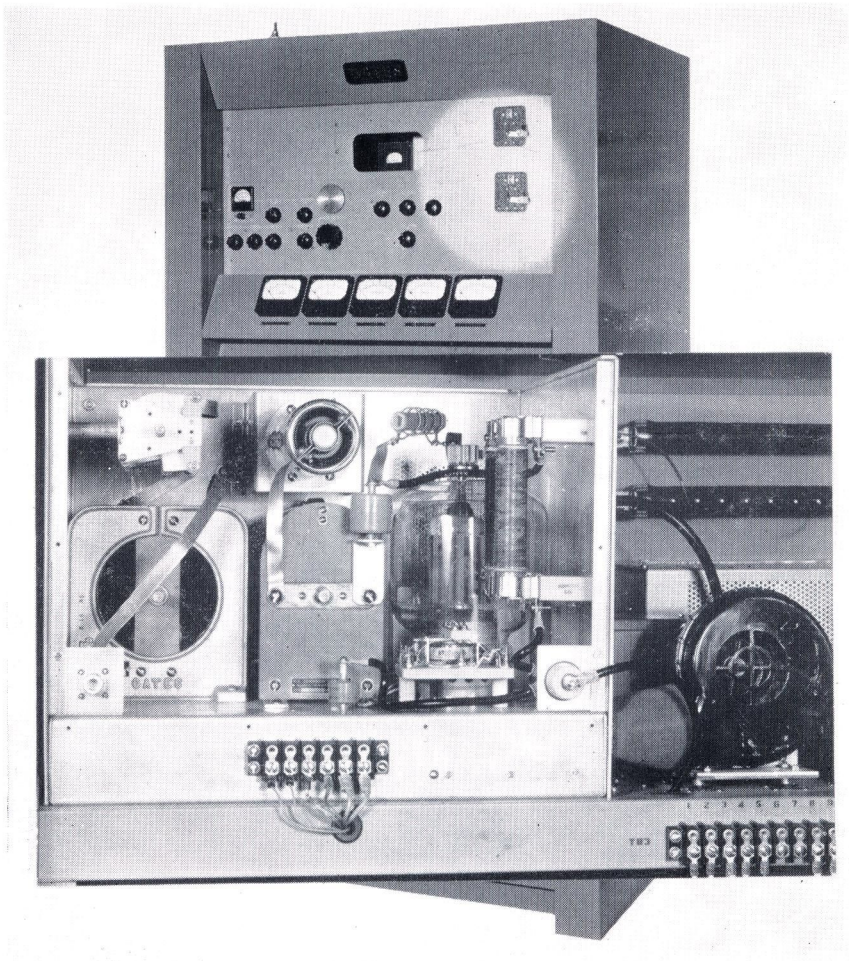
Heart of the HF-1M high frequency transmitter is the M-5239 exciter, pictured above. Accommodates 10 crystals in either open holders (0.02% accuracy) or in temperature controlled ovens (0.005% accuracy). Completely self-contained including metering, this exciter delivers up to 85W output to drive the final power amplifier directly. — Entire tune-up of the transmitter to the final stage is simple and quick. Select desired crystal frequency, set band change controls to proper frequency range and resonate. Logging for resonance is restricted to only two controls as oscillator is untuned. Has three stages: 6CL6 oscillator, 5763 amp. doubler and (2) 6146 output. A 6AQ5 screen clamper and OB2 regulator tube also employed. Keying or break-in is optional three ways: (1) oscillator cathode only, (2) IPA cathode only, or (3) both.

The result of many months of research, the ease in handling and complete stability at all frequencies is an important contribution to the fine overall performance of the HF-1M transmitter.

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GATES

HF-1M — FULL 1000 WATTS OUTPUT 2-32 MC



Spotlite the Power Amplifier:

In high frequency service there is no substitute for conservative design. Abundance of excess power is available in the HF-1M by use of the single 4-1000A blower cooled power amplifier tube in conjunction with large tank components. Only two tuned circuits, both operated with counter type front panel controls, permitting 1/10 revolution logging. Set the PA tuning and loading controls to desired frequency and you are ready to operate.

Continually variable rotating coils, ganged for one dial operation, tune with the PA stage from 3-32 Mc. Where operation is below 3 Mc a padder is added. For greater convenience and reliability a low power tune-up switch has been incorporated. This allows the operator to check exact resonance before applying full power.

Use of the 4-1000A power amplifier offers several outstanding features not usually found in this type of equipment. Most important is the tube rating actually capable of over 1500 watts output which means long life at 1000 watts. Use of only one tube in the final amplifier has definite advantages over multiple tubes. The single ended output lends to greater stability and use of low impedance transmission lines with minimum tuning.

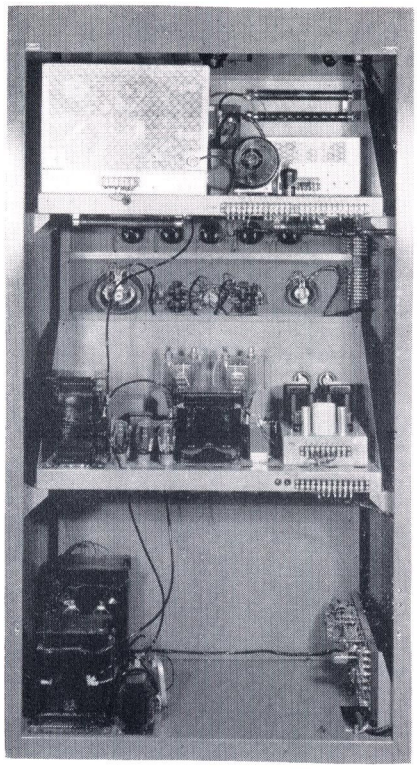
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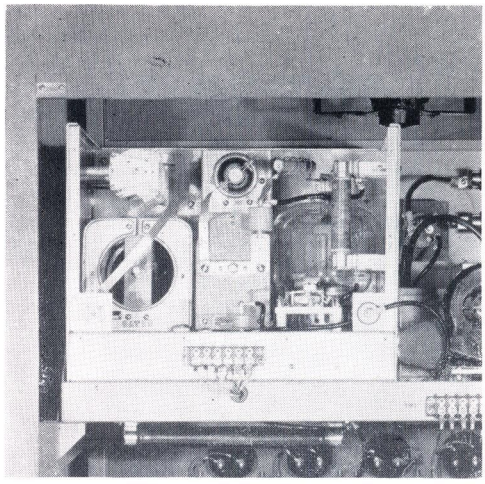
GATES

HF-1M HIGH FREQUENCY CW/PHONE TRANSMITTER

Outstanding HF-1M Features:

1. Continuously variable by front panel control 3-32 Mc. Where 2 Mc is desired, a simple padder is added.
2. Audio system either for broadcast or voice. When voice only, use with M-5263 limiter/filter amplifier.
3. Complete relay system including: (a) Fil. on relay, (b) Plate on relay, (c) Time delay relay, (d) PA overload relay, (e) Mod. overload relay and (f) Underdrive relay. The ideal system for complete protection and extension of operating control functions.
4. High level Class B modulation with twin-drive audio for full reliability, low distortion and long tube life through 833A modulators.
5. 230 volt, 50 or 60 cycles, single phase operation. Main power supply has 2-section choke filter for superior regulation and low ripple content.
6. Servicing ease and maintenance. Only one cable interconnects entire transmitter. RF and audio decks instantly removable to clean or service. Roomy construction along with blower and suction fan assures excellent cooling of all components.
7. Center line metering with large 4" meters reading all necessary metered circuits.
8. Low cost tube complement by reason of low initial cost and long operating life.
9. Easy installation. The HF-1M is supplied 100% finished. No cable to form, no parts to add. It is ready to operate.





Rear view HF-1M transmitter. Illustration directly above is open view of the 1KW power amplifier. The big 1KW power tube is in the right-hand section of the shielded compartment. — Left illustration, rear view. From top to bottom: radio frequency section, meter panel, control panel, audio and low voltage power supply section and at bottom right the relay control panel and bottom left, main power supply.

HF-1M SPECIFICATIONS

FREQUENCY RANGE: 2-32 Mc. Continuously variable by front panel tuning.
3-32 Mc. Padder added for 2 Mc operation.

POWER OUTPUT: 1000 watts, 100% modulated, 2-26 Mc.
800 watts, 100% modulated, 26-32 Mc.

TYPE OF OUTPUT: Single ended, full Tee network.

OUTPUT IMPEDANCE: 51.5 ohms. Where other output impedances are desired, special coupling units are available to match customer requirements.

RF STABILITY: Where used with JKO-2 temp. controlled oven, 0.005%. Where used with H-7 holder, 0.02%.

NUMBER OF CRYSTALS: Ten crystal positions. Where JKO-2 temperature controlled oven is used, 2 crystals are used in each oven. For non-temperature controlled crystals, up to ten type H-7 crystals and holders may be accommodated. Crystal switching from front panel.

KEYING: 60 WPM or may be used with FSK or electronic keyer for higher speeds. 3 keying circuit choices: (a) oscillator cathode only, (b) first IPA cathode only, (c) both oscillator and first IPA cathode. Permits complete break-in for all modes including voice.

AUDIO INPUT: 10 db +2 db as broadcast transmitter. When used with M-5263 limiter/filter amplifier (below), input is for either low level microphone or 600 ohm line.

FREQUENCY RESPONSE: As broadcast transmitter +2 db 50-7500 cycles. +2½ db 30-10,000 cycles. As communications transmitter (when used with M-5263 limiter/filter amplifier) +2½ db 200-2500 cycles with sharp cut-off above 2500 cycles.

DISTORTION: 3½% or less 50-7500 cycles at 95% modulation.

MODULATION: High level Class B.

POWER INPUT: 230 volts single phase 50/60 cycles. Consumption at 0% modulation or CW, 3200 W. At average modulation, 4500 W.

CARRIER SHIFT: 3% or less at 100% modulation.

SIZE: 78" high, 42" wide, 30" deep. Floor space 8.7 sq. ft.

WEIGHT: 1095 lbs. packed. 846 lbs. net. Cubage, 97.
Export weight, 1665 packed. Export cubage, 158.0.

COOLING: Squirrel cage blower cools final power tube and PA. Fan in ceiling of transmitter complete circulation through grill intake at bottom front.

TUBES: (Radio frequency) 5763 osc., 5763 amp. doubler, (2) 6146 drivers, 4-1000A power amp., OB2 regulator, (2) 6Y6G clampers, (audio) (2) 6SN7 input, (4) 1622/6L6G drivers, (2) 833A modulators. Power supplies: (4) 5R4GY, (2) 8008.

This model approved by the Federal Civil Defense Administration.

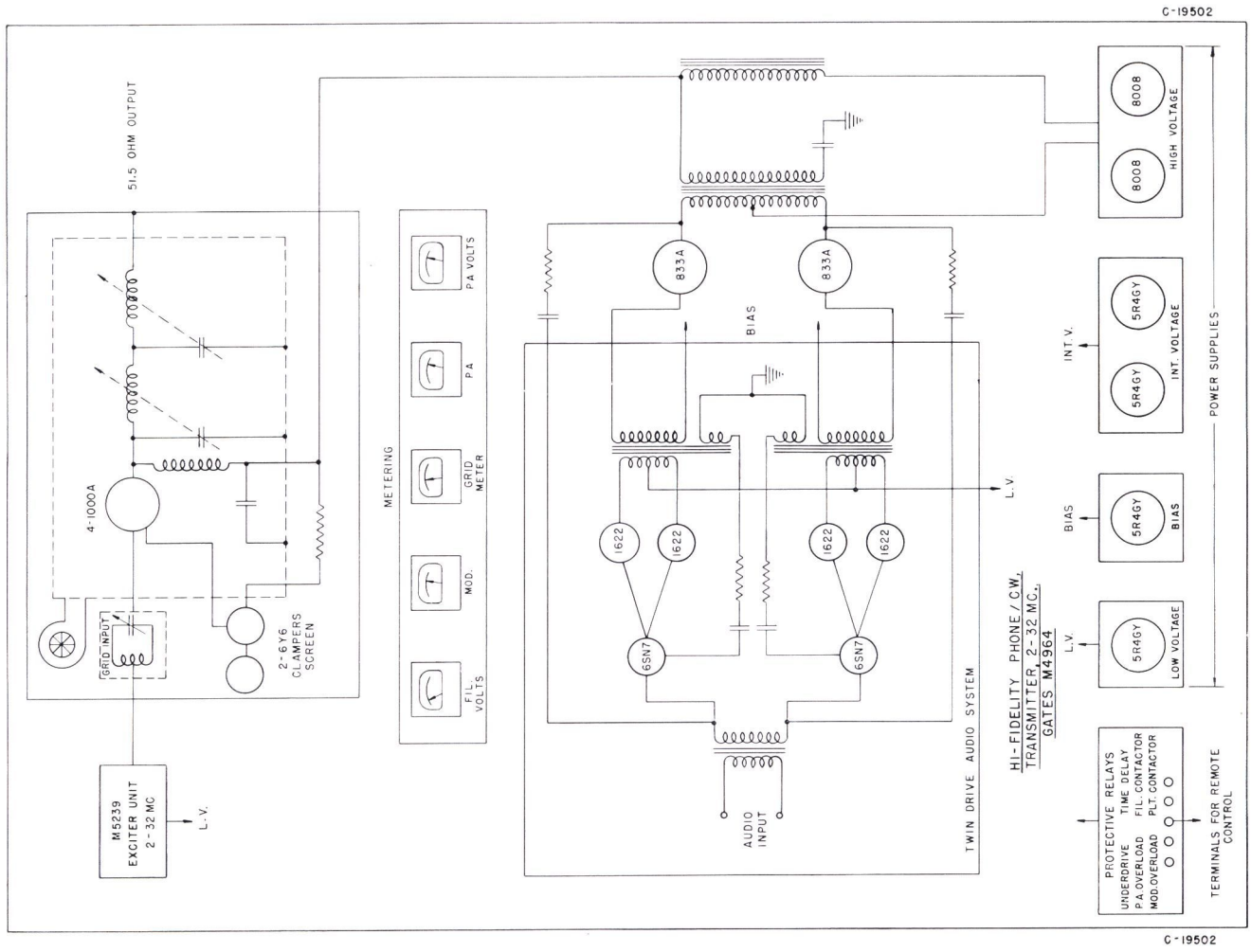
Communications Limiter/Filter Amplifier



Designed for use with the HF-1M transmitter where audio requirements are for voice frequencies only and where clear, crisp voice quality makes intelligibility of greatest importance. Includes peak limiting amplifier to keep modulation level always high without over-modulation. May be used with Hi-Z microphone or 600 ohm input line. Frequency response 200-2500 cycles.

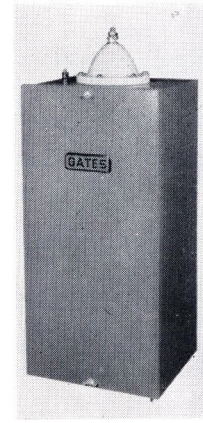
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HF-1M TRANSMITTER



FUNCTIONAL DIAGRAM HF-1M

SPECIAL LINE AND ANTENNA COUPLERS



Requirements of antennas are wide and varied in communications. Likewise, multiband operation is sometimes served by use of multiple antennas. The RF output impedance of the HF-1M transmitter of 49/73 ohms will match standard solid and open dielectric coaxial cable plus many of the more conventional antennas that are designed to match coaxial transmission line.

To handle other requirements, Gates offers two typical couplers. Others are available to meet specific customer needs. Where the M-5355 coupler is used, usually different antennas are employed for each frequency. This gives maximum efficiency at each operating frequency. Couplers may be switched either manually or by relays where couplers are located a distance from the transmitter. Customer should give full data on antenna to be used plus operating frequency, when ordering.

Coupler to match HF-1M transmitter to 600 ohm balanced transmission line M-5355

Coupler to match HF-1M transmitter to any conventional wire or vertical antenna at any single frequency M-5356

ORDERING INFORMATION

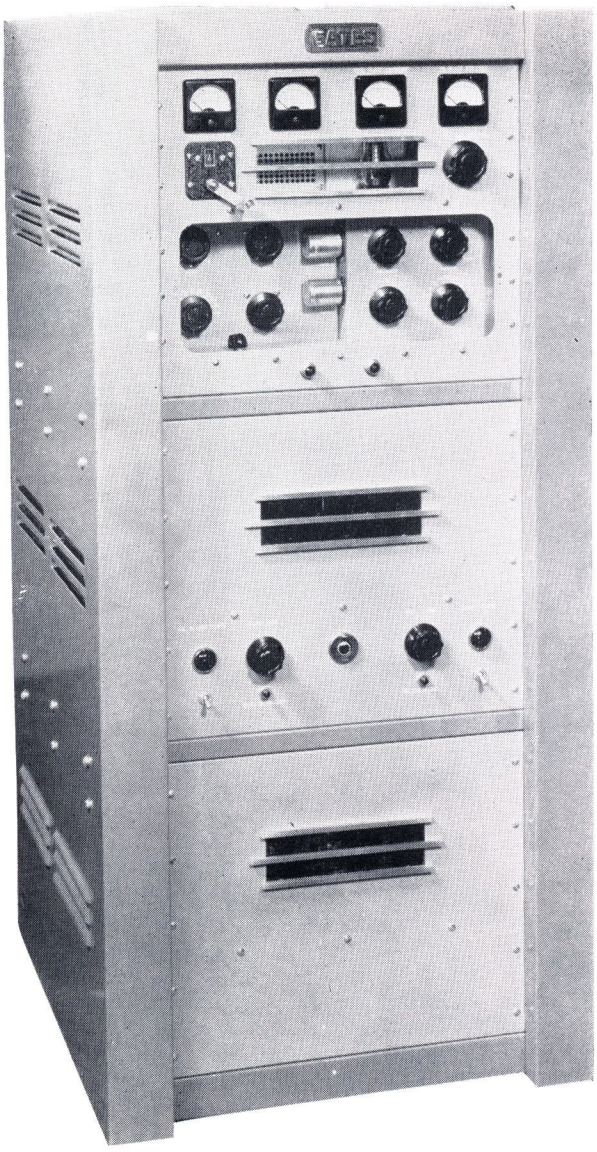
High frequency transmitter complete with one set of tubes, less crystals	**HF-1M**
100% spare tube complement for above	**TK-249**
Crystal and holder for 0.02% accuracy*	**H-7**
Crystal and holder for 0.005% accuracy (mounts in JKO2 oven)**	**H-17**
Temperature controlled oven (holds one or two H-17)	**JKO2**
Limiter/filter audio amplifier	**M-5263**

* State frequency when ordering.
** State frequency when ordering. Use only with JKO2 oven.

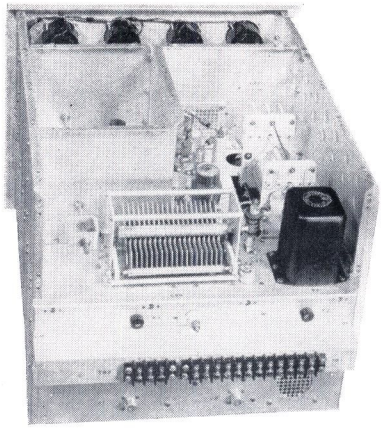
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GATES

MODEL CMG-1 2-26 MC 250-WATT TRANSMITTER



Continually variable 2-26 Mc for telephone and telegraph service at 250 watts output—high level modulated.



Complete in every detail, the CMG-1 short wave transmitter may be quickly changed in frequency direct from the front panel. Each frequency may be logged and returned to in seconds.

Four crystal inputs, audio system for microphone or line, 3000 cycle cut-off filter, peak limiting amplifier to prevent over-modulation and small overall size, will make this equipment attractive for many commercial uses.

GENERAL DESIGN: Construction is on 3 rugged chassis that mount into the transmitter cabinet and join together with a preformed cable. As each chassis is quickly removable and largely independent of the other, servicing is greatly enhanced. Top chassis is a complete radio frequency unit with output coupling network. Center chassis is the modulator. Bottom chassis is the main power supply.

RF CHASSIS: 3 stages with two 4/65A power amplifiers produces a full 250 watts carrier at any frequency between 2-26 Mc. Provision is made for 4 crystals which mount (2 per oven) in a JKO-2 temperature controlled oven for .005% or better stability. Connections for external VFO are provided. There are no plug-in coils or relays to effect frequency change. Dial and veeder counter indicators allow accurate logging for quick frequency change. Output is a Pi-network allowing a wide variety of impedance matching.

MODULATOR: Includes microphone amplifier with push-to-talk facilities, line input of 500 ohms, peak limiter allowing compression of as much as 25 db with excellent intelligibility, 3000 cycle cutoff filter and high level Class B 811A tubes assure 100% modulation at all times.

POWER SUPPLIES: Two provided. Main supply is full wave 866A tubes well filtered. Plate and bias voltages for low stages are supplied by a full wave system with a 5V4 rectifier.

METERING: Four meters include: (1) PA current; (2) plate voltage; (3) RF output, and (4) multimeter for oscillator plate, IPA grid, IPA plate, PA grid and modulator currents.

RELAY CIRCUITS: Standard equipment includes: (1) push-to-talk; (2) receiver muting; (3) vacuum time delay; (4) PA overload, and (5) modulator overload.

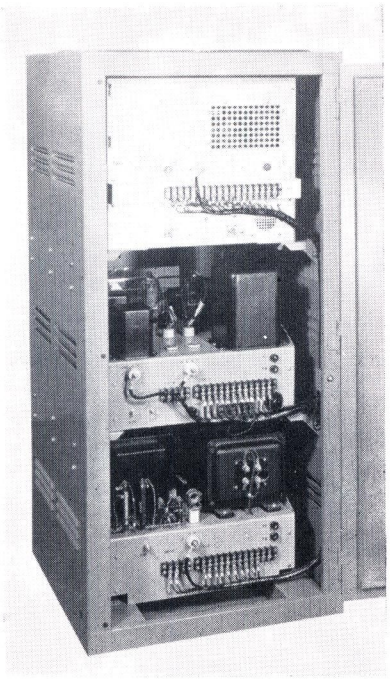
CONTROLS: Filament start switch, plate start switch, overload front panel reset audio gain, PA plate tune, antenna loading, oscillator resonance, IPA resonance, and PA excitation. Pilot lights adjoin starting switches.

OPTIONAL FILTERS: Though harmonic reduction of the CMG-1 transmitter is excellent, in extreme cases of close proximity to other services an additional second harmonic filter may be desired. For certain services within the United States it is necessary to install a special low pass filter. These filters will be quoted according to customers exact need.

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GATES

MODEL CMG-1 2-26 MC 250-WATT TRANSMITTER



Rear view CMG-1 transmitter with door removed for illustrative purposes.

SPECIFICATIONS

FREQUENCY RANGE: 2-26 Mc continuously variable.

POWER OUTPUT: 250 watts.

OUTPUT IMPEDANCE: 51.5 ohms.

AUDIO INPUT: Hi-Z for microphone at −55 db input. 600 ohms at 0 dbm input level.

FREQUENCY RESPONSE: ±2 db 200-3000 cycles with sharp cut-off above 3000 cycles.

DISTORTION: Less than 8% at all frequencies 200-3000 cycles. 100% modulation.

MODULATION: High level Class B.

POWER INPUT: 1000 watts at 115 volts, 50/60 cycles, at average modulation.

KEYING SPEED: 60 WPM.

NUMBER OF CRYSTALS: Maximum of four (Type H-17 in JKO-2 oven). See Crystals (Index).



M-4576 microphone includes dynamic microphone, 7" cable and connector with push-to-talk desk stand. Plugs into receptacle on CMG-1 transmitter.

STABILITY: When used as above, 0.005%.

VFO INPUT: Provided on receptacle rear terminal board of transmitter.

TUBES: 6AG7 oscillator; 6146 IPA; two 4/65A; two 866/866A rectifiers; 5V4 LV rectifier; 6SJ7 mic amplifier; 6L7 second amplifier and line input; 6C5 third stage; 6L6 driver; PP 811A modulators; 6H6 limiter tube and 5U4G modulator rectifier.

FINISH: Medium gray.

SIZE: 50" high, 23" wide, 26" deep. Door swing 20".

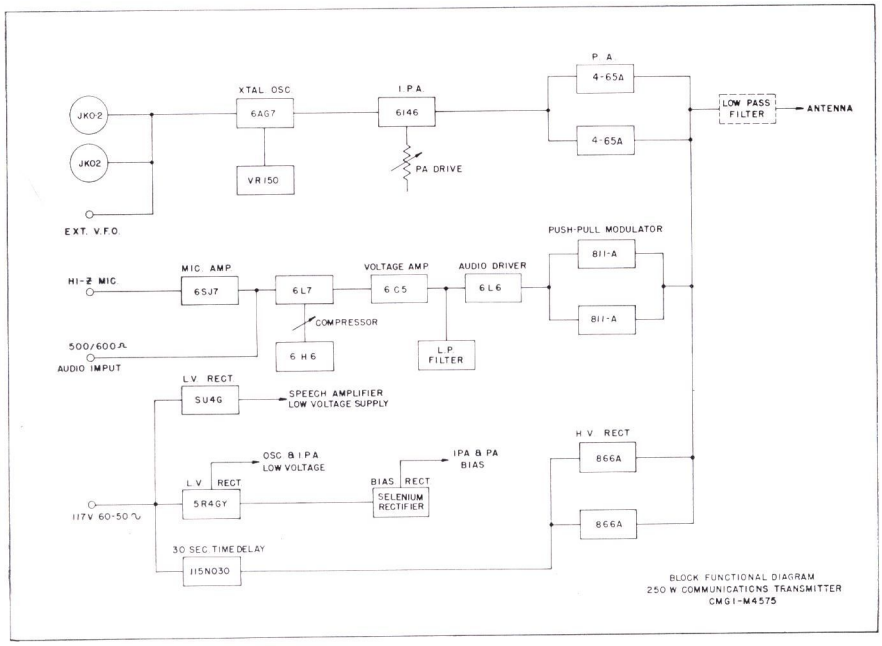
ESTIMATED WEIGHT: 550 lbs. packed. Export packed, 720 lbs. Export cubage, 53.8.

ORDERING INFORMATION

Complete transmitter with tubes, less crystals	**CMG-1**
Crystal in holder (less oven) for 0.02% accuracy	**H7**
Crystal in holder for .005% accuracy	**H17**
Oven to accommodate two H17 crystals	**JK02**
100% spare tube complement	**TK136**
Microphone assembly complete	**M-4576**
Filters for added second harmonic attenuation: For 50 ohms	**LPF-52**
For 72 ohms	**LPF-72**
For 250 ohms	**LPF-250**

This model approved by the Federal Civil Defense Administration.

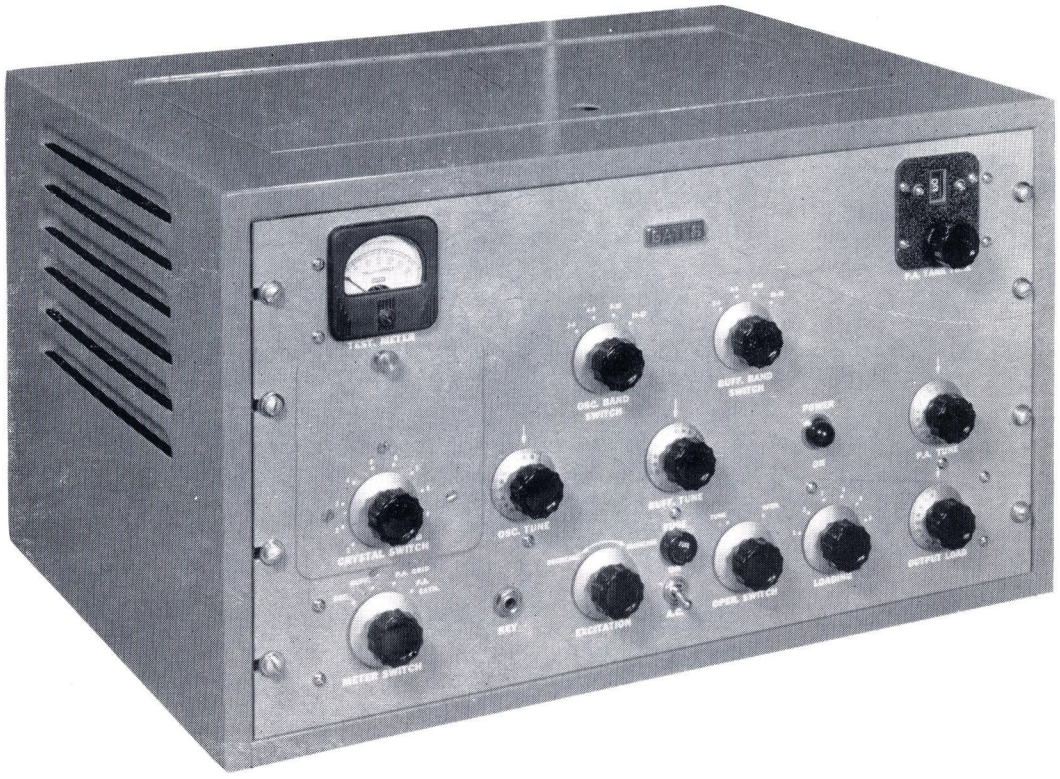
NOTE: Be sure to state crystal frequency when ordering.



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GATES

65/85 WATT TRANSMITTER OR EXCITER



A carefully engineered precision RF unit having a wide variety of applications. Designed strictly for commercial applications and tunes all frequencies continuously variable, between 2 and 32 megacycles. When used with the M5570 amplifier modulator, described immediately following, an excellent 65 watt (power input) telephone transmitter, meeting full FCC specifications, is had. As a CW transmitter, this unit is complete to matching a wide variety of output impedances and self-contained power supply. For use as a dependable exciter for higher powered transmitters, there is ample power output to drive many variations of RF power amplifiers without the need for an RF driver stage.

A ten crystal, front panel, removable oscillator unit accommodates either temperature controlled ovens or non-temperature controlled crystal holders. Calibrated dials and a counter type dial on the final variable tank coil assure excellent logging for tuning by non-technical personnel. A single meter, switch selected, indicates oscillator, IPA, PA grid and PA plate current. — Frequency multiplication is accomplished in the oscillator with the advantage of low frequency crystals not exceeding 8 Mc, used for all output frequencies up to 32 Mc. A further advantage of the IPA stage always operating at the same frequency as the power amplifier stage adds to stability and ease in initial tune-up and future logging.

Either rack or desk cabinet mounting may be employed. The modest size of 10½" by 19" of rack space indicates a generous amount of engineering time in the design.

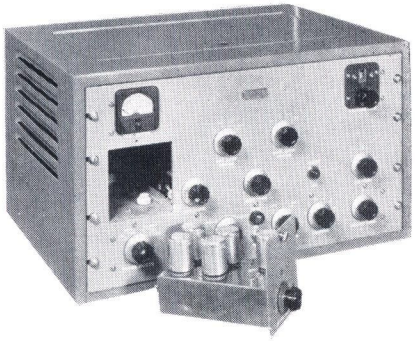


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GATES

SPECIFICATIONS — MODEL M-5569

(65/85 Watt Transmitter)



Transmitter unit with multiple crystal section of drawer type showing fast potential for crystal change.

FREQUENCY RANGE: 2-32 Mc continuously variable from front panel.

POWER INPUT: 85 watts CW or 65 watts high level modulated.

OUTPUT IMPEDANCE: 30 to 300 ohms unbalanced.

CRYSTAL INPUT: 10 Type H-17 which may be mounted in five Type JK02 temperature controlled ovens (2 crystals to an oven) for 0.005% accuracy or when not mounted in oven, 0.02% accuracy. Crystals selected from front by switch.

KEYING: Electronic differential keying permitting fast break-in operation. May be left on standby (key up) for long periods without detriment. Keying speed 60 WPM. When used with modulator, push-to-talk circuit operates same as keying.

TUNING CONTROLS: Crystal switch, oscillator tune, oscillator band switch, buffer tune, buffer band switch, PA tank frequency, PA tune, output loading.

OPERATION CONTROLS: Meter switch, excitation, operation switch, key jack, On-Off switch and fuse.

TUBES: 5763 osc., 5763 IPA, (2) 6146 power amplifiers, OB2 screen switch tube, 6AQ5 screen clamper, 12AU7 keyer tube, 6AL5 bias rectifier, (2) 5R4GYA rectifier.

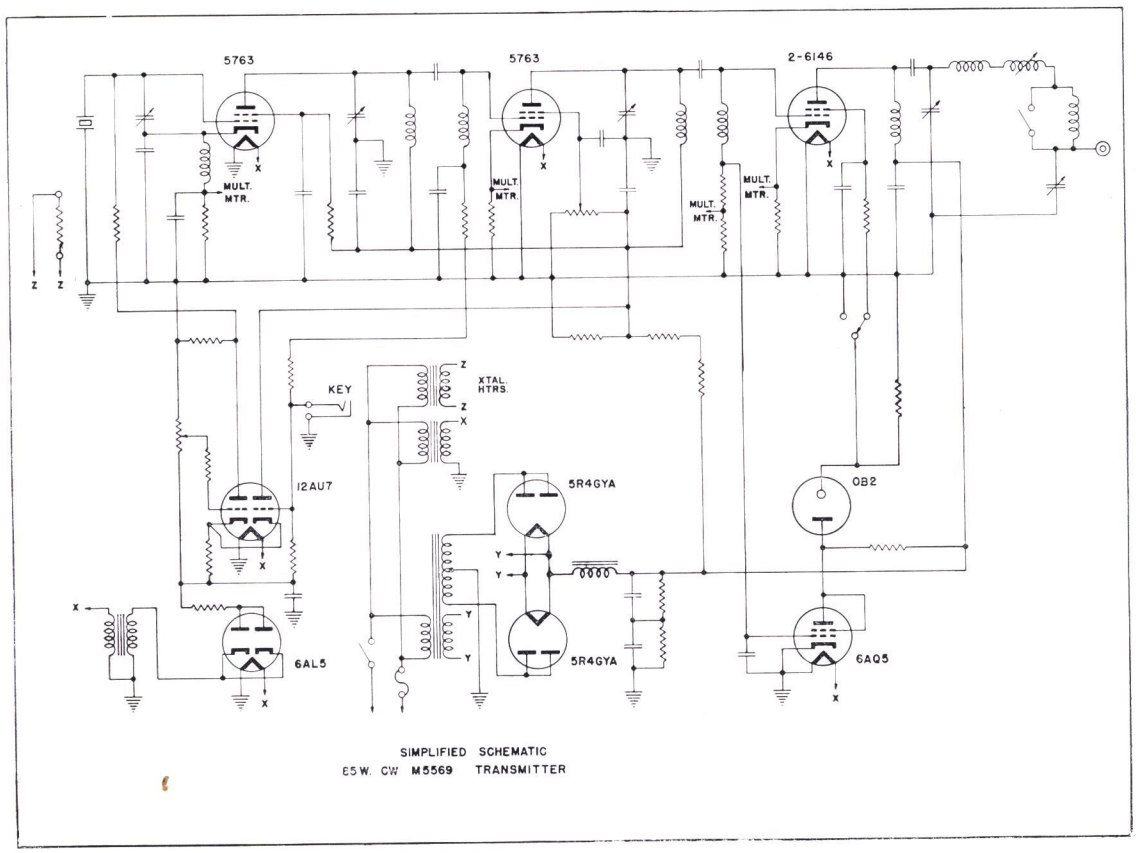
AC POWER: 115 volts, 50/60 cycles, 175 watts.

SIZE: For rack mount — 19" wide, 10½" high and 14½" deep.
In cabinet (as illustrated) — 20½" wide, 12" high and 15" deep.

ORDERING INFORMATION

Complete CW transmitter with tubes	**M-5569**
100% spare tube kit for above	**TK-291**
Crystal and holder for 0.02% accuracy	**H-17**
Temperature controlled oven to hold two Type H-17 crystals and holders for 0.005% accuracy	**JKO2**

NOTE: Please state carrier frequency desired when ordering crystals. For complete telegraph and telephone transmitters, see subsequent pages, Model CM-65.

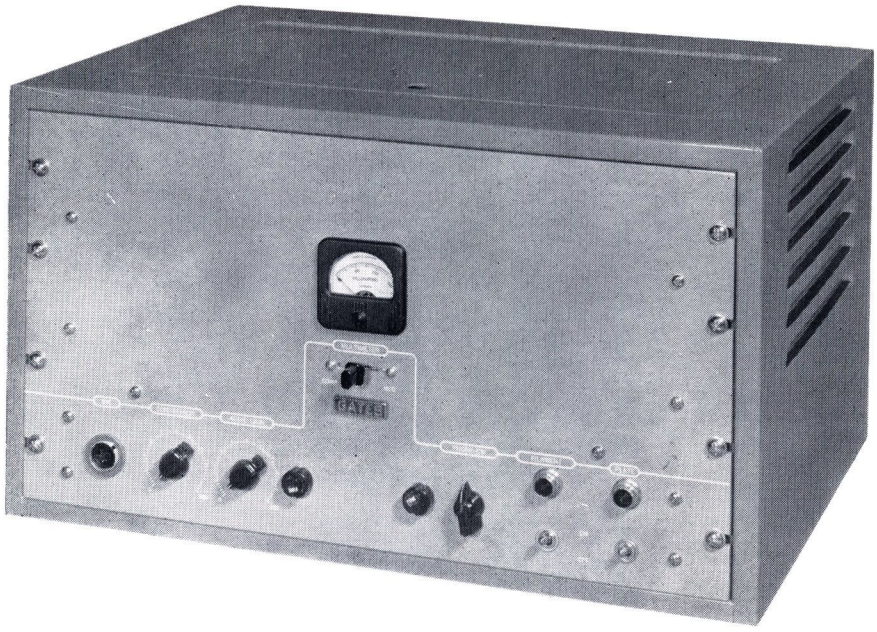


SIMPLIFIED SCHEMATIC
65 W. CW M5569 TRANSMITTER

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GATES

MODULATOR/AMPLIFIER FOR 65 WATT TRANSMITTER



Designed as a companion unit for the M-5569 transmitter on the preceding page. Has four stages with low-pass filter and peak limiting amplifier to meet full FCC specications. Meter switch selects to read either compression or modulator swing. Front panel equipment includes microphone receptacle, compressor setting, gain control, fuse, phone-CW switch, filament switch with pilot light and plate switch with pilot light. Push-to-talk function operates in keying circuit of the M-5569 transmitter. Power supply is self-contained. This equipment will operate with any low level Hi-Z microphone and supply 100% modulation to the 65 watt input carrier.

SPECIFICATIONS

APPLICATION: Designed for high level modulating the M-5569 transmitter on preceding pages. May be used with any similar powered transmitter, however.

AUDIO INPUT: Hi-Z for use with M-4576 microphone listed herein with push-to-talk desk stand. Any similar microphone of dynamic or crystal type may be used.

LIMITER: Fast acting with limiter action indicated on meter.

LOW-PASS FILTER: Cuts off audio response at 5000 cycles 40 db or better.

RESPONSE: ±3 db, 300 to 2500 cycles. Down 20 db at 50 cycles and 40 db at 5000 cycles.

DISTORTION: 8% or less, 300 to 2500 cycles.

NOISE: 40 db or better below the equivalent to 100% modulation of a 65 watt (input) transmitter.

TUBES: Two each 12AT7, 6146, 5R4GY, VR-105. One each 5879, 6AK6.

SIZE: Rack mounted — 19" wide, 10½" high, 14½" deep.
In cabinet as illustrated — 20½" wide, 12" high, 15" deep.

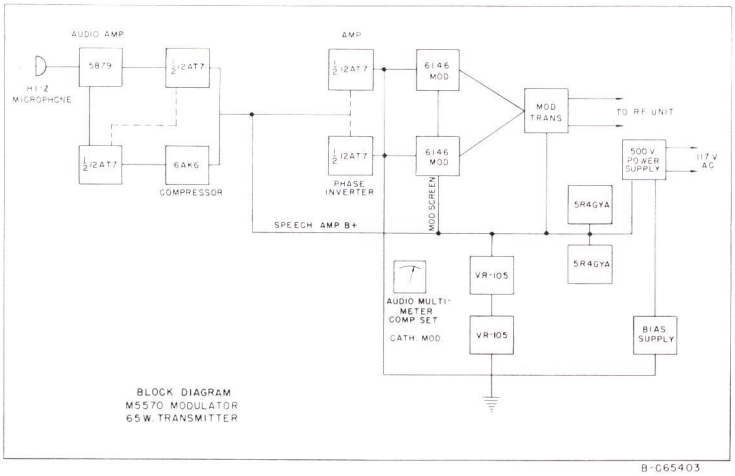
POWER: 115 volts, 50/60 cycles at 240 watts (100% modulation).

WEIGHT: 90 lbs. packed. Cubage 4.

ORDERING INFORMATION

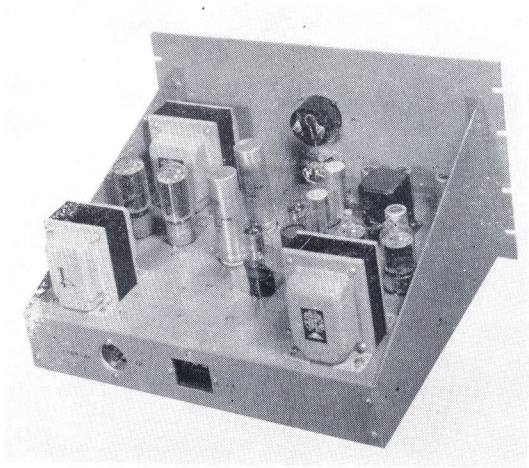
Modulator complete with tubes, less microphone M-5570
100% spare tube kit for above TK-292
Microphone with push-to-talk stand, cord and plug M-4576

NOTE: Microphones listed next page.



BLOCK DIAGRAM
M5570 MODULATOR
65 W. TRANSMITTER

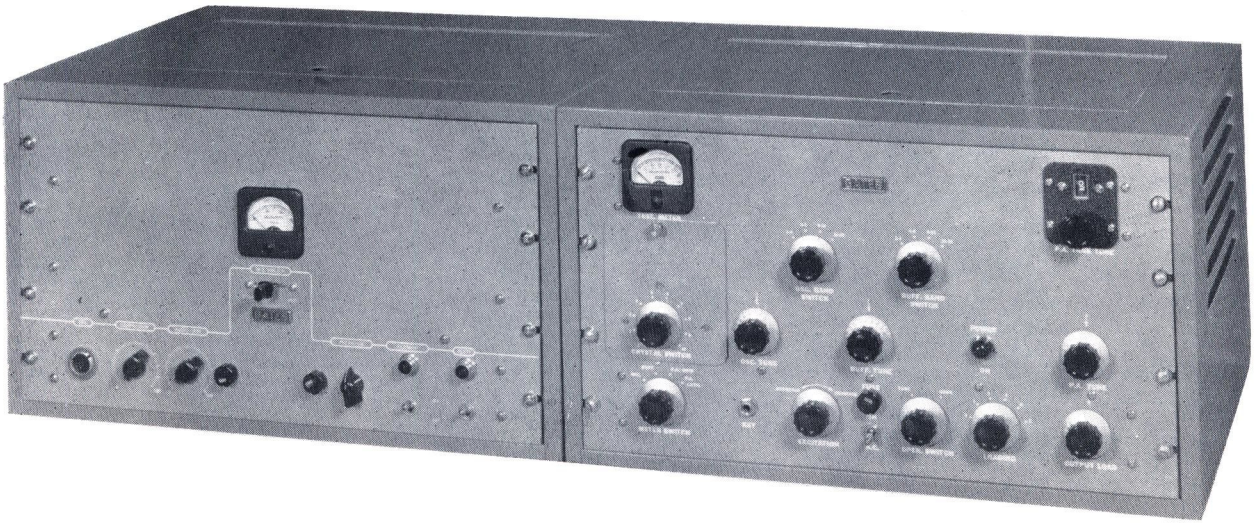
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GATES

COMPLETE 65 WATT TELEPHONE, 85 WATT CW TRANSMITTER

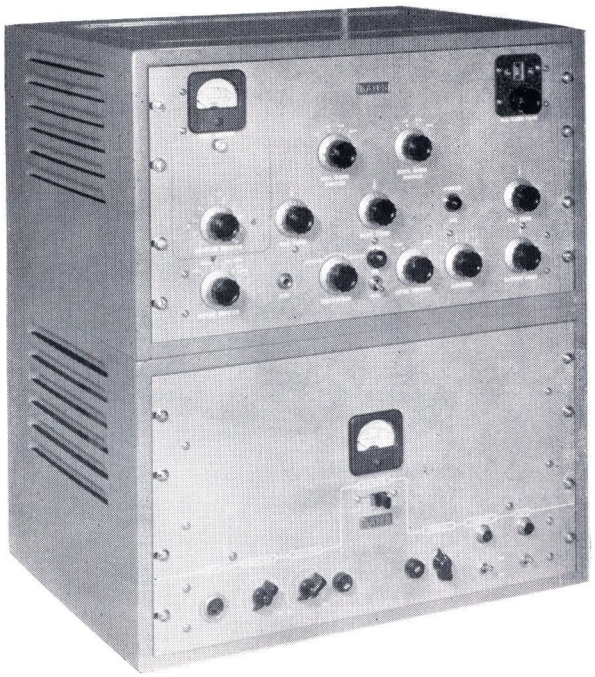


Consists of the M-5569 transmitter and M-5570 modulator/amplifier, fully described on the preceding pages. When used with the M-4576 push-to-talk microphone unit, illustrated at the bottom of the page, a complete telephone and telegraph transmitter that will meet all current regulations, tune continuously from 2 to 32 megacycles, is ready to attach to a wide variety of antennas from 30 to 300 ohms.

Either horizontal or vertical mounting of the transmitter and amplifier cabinets is illustrated on this page. The two cabinets connect together with one cable having heavy plugs on each end. Rack mounting along with other equipment is another excellent method of installation and this equipment is offered in that manner also.

Here is a commercial AM high frequency transmitter that will handle 24-hour day schedules with complete reliability. Tuning all frequencies between 2 and 32 Mc from the front panel, having ten crystal positions, a sharp, easy to read voice quality and fast action peak limiting for full modulation without over-modulation, those requiring the very finest will appreciate this new Gates transmitter. Separate power supplies in the transmitter and modulator units make them independent of each other and assure all the benefits of dual power supplies for RF and modulator.

For specifications, please refer to the preceding pages on the M-5569 and M-5570 equipments.



ORDERING INFORMATION

Complete transmitter with tubes but less microphone and crystals	**CM-65**
Complete transmitter, same as above but less cabinets, for rack mounting	**CR-65**
Push-to-talk microphone unit complete	**M-4576**
Crystal and holder for 0.02% accuracy	**H-17**
Temperature controlled oven to hold two Type H-17 crystals for 0.005% accuracy	**JKO2**



M-4576 dynamic microphone with push-to-talk desk stand, 7' cable and plug. Grip handle and transmitter turns on, release and it turns off. Output, —55 db. Hi-Z type.

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GATES

COMPACT 2-32 MC CONTINUOUSLY VARIABLE TELEPHONE/TELEGRAPH TRANSMITTER

(50 Watts Input)



For light, compact service over the entire frequency range between 2 and 32 Mc, Gates offers the M-5078 transmitter. Rated at 50 watts input for either telephone or telegraph service, this transmitter will fill many requirements at modest price and the reliability expected from commercial equipment.

CONSTRUCTION is in two cabinets, each 14½" wide, 9½" high and 11½" deep. These cabinets may be installed as shown above or one on top of the other where table space is limited. Transmitter comes complete with plug-in connecting cable for joining the two cabinets electrically and push-to-talk hand type carbon microphone.

RADIO FREQUENCY section is one cabinet. A two-stage amplifier consists of a 6AQ7 oscillator and 6146 power amplifier along with a 6AQ5 clamper tube and three OA2 regulator tubes. Provision is made for two crystals with crystal change of plug-in design. Output utilizes a Pi-net section for matching a wide range of antennas.

MODULATOR/POWER SUPPLY is in the second cabinet. A 3-stage audio amplifier high level modulates the transmitter. A single 5R4GY rectifier tube supplies all DC voltage to the transmitter in a full wave, well regulated and well filtered supply.

METERING: A single meter with selector switch indicates power amplifier grid current, power amplifier plate current and modulator plate current.

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GATES

TELEPHONE/TELEGRAPH 2-32 MC COMMUNICATIONS TRANSMITTER

KEYING is in the oscillator and power amplifier cathode circuits. Speeds up to 60 WPM with excellent wave form are easily obtained.

BREAK IN operation for telephone includes push-to-talk microphone which activates power to the transmitter and an antenna change-over relay that connects the antenna to the receiver when not transmitting.

FREQUENCY CHANGE is all from the front panel. A counter type dial for logging the variable tank coil and dials for exact logging of other tuned circuits, permits front reset to any frequency with non-technical personnel. Crystal change beyond the two crystal positions is by lifting the lid for quick accessibility.

TUBES: Oscillator, 6AG7
Power amplifier, 6146
Oscillator screen regulators, (2) OA2
PA screen regulator, OA2
PA screen clamper, 6AQ5
1st audio, 12AU7
2nd audio, 12AU7
3rd audio and modulator, (2) 6L6
Rectifier, 5R4GY

SPECIFICATIONS

FREQUENCY RANGE: 8-32 Mc continuously variable.

CRYSTAL POSITIONS: Two Type H-7 for .02% accuracy or for .005% accuracy these mount in JKO2 oven (see Ordering Information).

CRYSTAL FREQUENCIES: Up to 16 Mc output frequency doubles crystal frequency above 16 Mc.

POWER INPUT: 50 watts equal to approximately 30 watts output to 10 Mc and 25 watts up to 32 Mc.

RF OUTPUT IMPEDANCE: 49-300 ohms unbalanced.

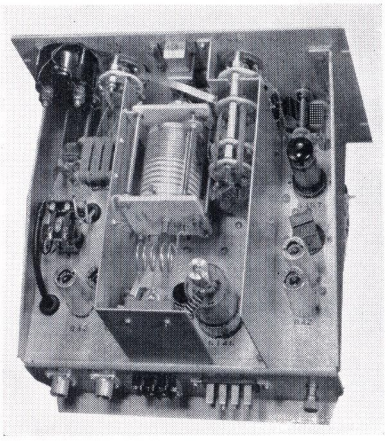
POWER INPUT: 117 volts, 50/60 cycles AC, 225 watts.

AUDIO INPUT: Low impedance for carbon microphone approximately 75 ohms.

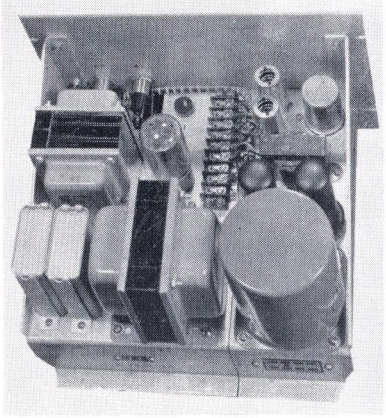
EMISSION: A1 (CW) and A3 (phone).

SIZE: Each cabinet, 14½" wide, 9½" high, 11½" deep.

WEIGHT: Estimated total (both cabinets), 80 lbs.



Interior view RF section of M-5078 transmitter.



Interior illustration of modulator — power amplifier cabinet of M-5078 transmitter.

ORDERING INFORMATION

Transmitter complete with tubes and microphone, less crystals	**M-5078**
Crystal and holder for 0.02% accuracy	**H-7**
Temperature controlled oven for (2) H-7 crystals	**JKO2**

NOTE: When ordering crystals, please state carrier frequency desired and we will compute crystal frequency where need be.

●

SPECIAL MODELS

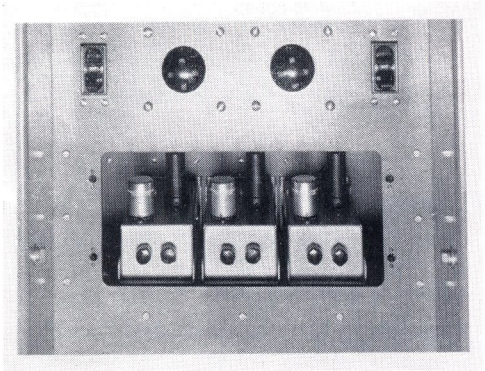
On special order, the above transmitter is available for other power line voltages and also for six or twelve-volt battery operation.

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GATES

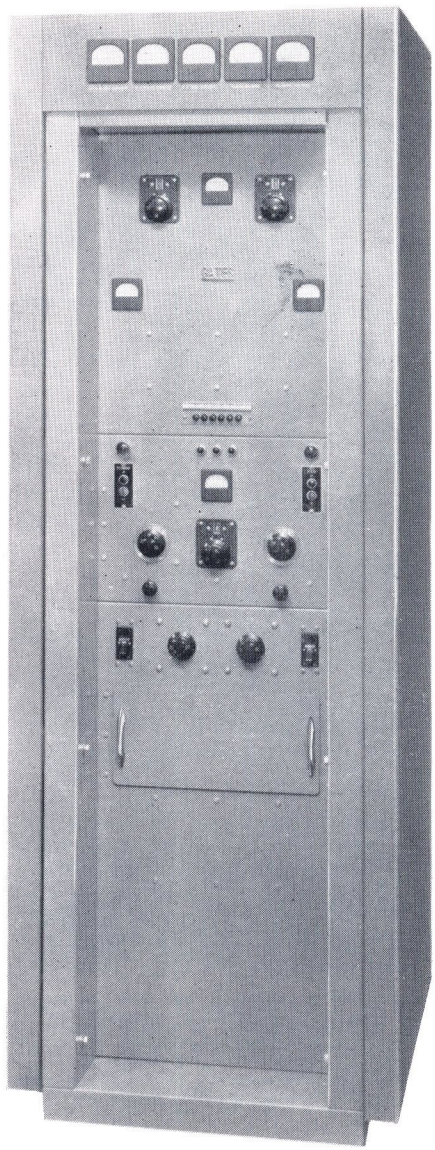
MODEL CMP-1 1000-WATT INPUT TELEGRAPH TRANSMITTER

- **Specifically for police band from 2805-7935 Kc but models available for 2-10 Mc.**
- **High speed electronic keying.**
- **Multi plug-in oscillators for quick frequency change.**
- **Remote control as optional accessory.**
- **Heavy design for 24-hour, day-in and day-out service.**
- **Designed for ease of maintenance and servicing.**



Transmitter accommodates three oscillators of plug-in type which slide into the front of the transmitter, as illustrated above. Each oscillator completely self-contained other than power supply. Provided with temperature controlled crystal holder for 0.005% accuracy. Changing oscillators is accomplished through three relays, push-button operated from transmitter control, or optional remote control.

This 1000 watt high speed telegraph transmitter is designed specifically for police service where three closely associated crystal frequencies are employed, such as 2804, 2808 and 2812 — a typical police band. Its design, however, is adaptable to any frequency between 2-10 Mc, and is for use where a highly reliable, heavy duty, high speed telegraph transmitter is required.



GENERAL DESIGN: Transmitter is completely constructed in one cabinet 78" high, 28½" wide, 32" deep, with full size back door, forced air cooling of power tubes, convex cooling of transmitting plant with filtered air intake. Sides of cabinet are removable and cabinet design is such that all front panel controls are inset to prevent brushing control accidentally when walking by. Finish is in dark gloss gray for easy cleaning.

OSCILLATORS: Three provided, each having a temperature controlled oven operating from self-contained transformer of the self-tuned type, selectable into the transmitter by relays. Push-button control oscillators removed from front for either servicing or if for any reason it is desired to change frequency. Design of oscillator is for extreme accuracy and impervious to fall-out.

INTERMEDIATE AMPLIFIERS: The output of the oscillators is fed into a 6AG7 doubler stage, self-neutralized. The doubler and oscillator are electronically keyed (see keyer). The second intermediate amplifier is a 4-65A, self-neutralized. The use of three RF stages prior to the power amplifier is complementary to a square wave form during keying. Prevents possibility of an interaction between the power amplifier and oscillator plus assuring an abundance of driving power to the final amplifier under all conditions.

POWER AMPLIFIER: Consists of two 4-400A tubes, self-neutralized and in parallel operation. Tubes are forced air cooled through a blower mounted directly to the air duct/tube socket assembly. An air pressure control switch is part of this assembly for full tube protection in case of blower failure. Output coupling provides unusually good harmonic attenuation. This is a parallel resonant tank circuit into an L section which develops a pi-network. Because of this type of circuit, the purchaser should stipulate the RF output impedance desired when ordering. Standard output impedance 51.5 ohms. An external low-pass filter is used for harmonic reduction.

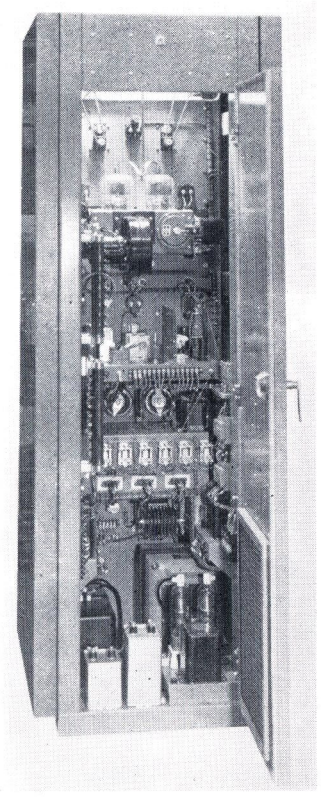
KEYER: Electronic keying, which operates in the plate circuit of the oscillator/first IPA—doubler stage, employs the principle of biasing an 811A tube where with the key closed, no current is drawn. Though keying up to

(continued next page)

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MODEL CMP-1 1000-WATT INPUT TELEGRAPH TRANSMITTER

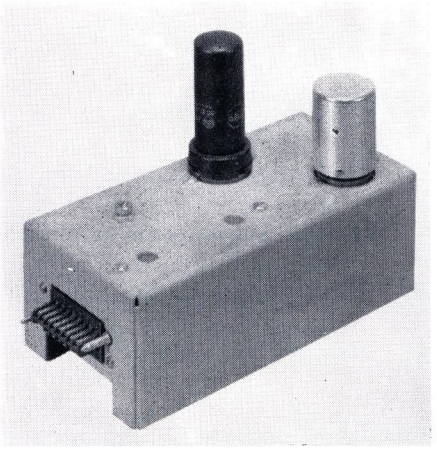


KEYER (continued)
100 WPM is recommended, higher speeds are not unusual. This transmitter may also be adapted to frequency shift keying and will be so supplied when stated on the order. Frequency shift keyers are listed elsewhere in this catalog (see Index).

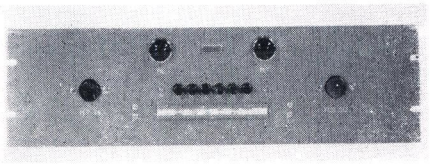
METERING: Nine meters are standard equipment, reading all major circuits.

PROTECTIVE DEVICES: Include PA overload relay, bias under voltage relay, time delay relay, filament start relay, plate start relay, air pressure switch of diaphragm type, and all necessary interlocks.

POWER SUPPLIES: Five are supplied including main high voltage, full wave rectifier, low voltage bias supply, low voltage selenium supply for relay/remote operation, plus screen supply.



Individual view of one of the three plug-in oscillator units employed in the CMP-1 transmitter. Oscillators may be removed without disconnecting a wire and from the front of the transmitter.



Remote control panel for use with CMP-1 transmitter where transmitter is remotely controlled from a control desk either adjacent or several hundred feet distant. Mounted on standard 19"x5¼" rack panel. Includes plate On-Off switch, keying facility, pilot lights indicating filament and plate On, and push-button for selection of operating frequencies.

SPECIFICATIONS

FREQUENCY RANGE: Specifically designed for 2-8 Mc police frequencies but available on order for any frequency up to 10 Mc.

OSCILLATORS: Three supplied to frequency as ordered.

POWER INPUT: 1000 watts.

INPUT VOLTAGE: 230 volts, 3-wire, single phase, 50/60 cycles.

KEYING: Electronic 100 WPM or less.

FREQUENCY SHIFT KEYING: Optional provision when ordered. FSK not part of transmitter (see FC keyers—Index).

SIZE: 78" high, 28½" wide, 32" deep.

FINISH: Dark gloss gray.

TUBES: Three 6AG7 oscillators, one 6AG7 Doubler, one 4/65A RF driver, two 4/100A RF amplifier, one 6B4G keyer, two 8008, high voltage rectifier, one 5U4G low voltage rectifier, one 5U4G bias rectifier, one 5U4G screen rectifier.

RF OUTPUT IMPEDANCE: 51.5 ohms.

RF STABILITY: 0.005% or better.

LOGGING: Veeder counter controls on all variable controls to one-tenth turn. Accurate dial controls on other variable units for any pre-set logging of frequency.

WEIGHT: Export packed, 1100 lbs. Export cubage, 90.0.

ORDERING INFORMATION

Complete transmitter for operation on 2804, 2808, and 2812 Kc, with tubes, less crystals **CMP-1**

Complete transmitter for operation on 5135, 5140 and 5195 Kc, with tubes, less crystals **CMP-1A**

Complete transmitter for operation on 7480, 7805 and 7935 Kc, with tubes, less crystals **CMP-1B**

Complete transmitter for operation on any closely associated frequencies not stated above up 10 Mc, with tubes, less crystals **CMP-1D**

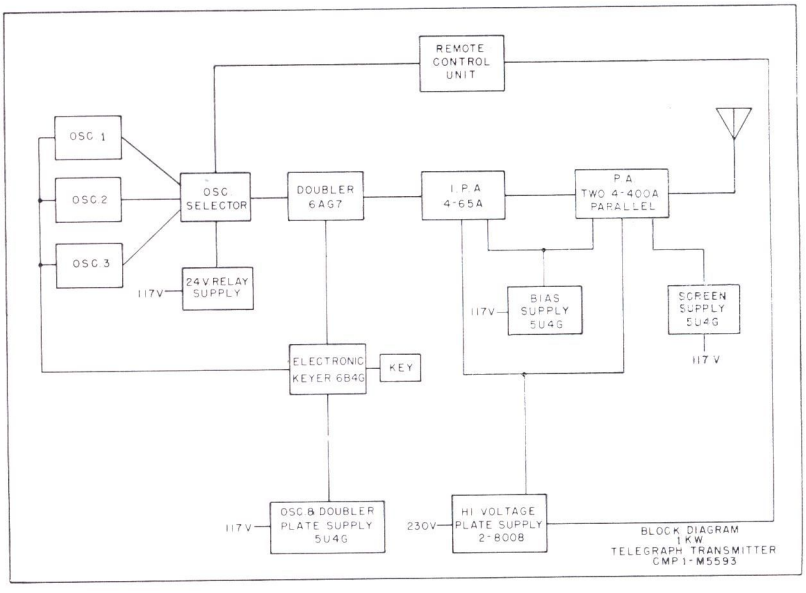
Remote control panel, rack mount, two transmitters **CON-2**

Remote control panel, rack mount, three transmitters **CON-3**

100% spare tube complement for above transmitters **TK-138**

This model approved by the Federal Civil Defense Administration.

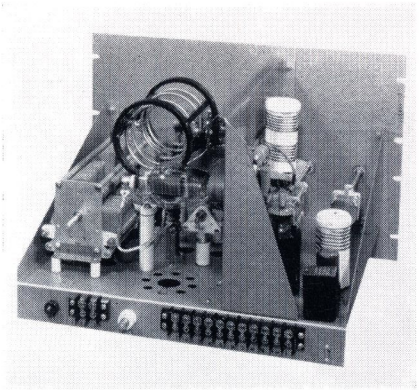
NOTE: Be sure to specify frequency of operation and transmission line impedance when ordering.



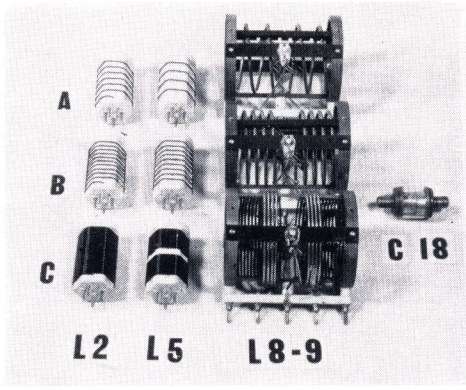
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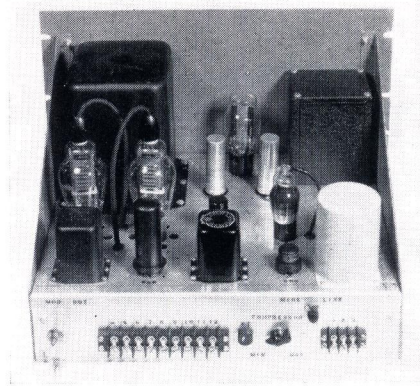
250 WATT UNIT SYSTEM TRANSMITTER



Radio frequency unit, 3 RF stages, temperature controlled oven and crystal, 6V6GT osc., 807 IPA, two 812A power amplifiers in push-pull. Output 50 ohms from variable link. Operates either direct to 50 ohm line or into coupling units listed below. Metering through meter panel on transmitter. Model M-3452Y.



Five coil sets cover the entire 2-22 Mc band. 2-3 Mc coil set also includes small vacuum padder. For specific frequency operation only the proper coil set is purchased. Likewise additional coil sets may be purchased for any or all frequency coverage. Type number of sets listed with the transmitters.

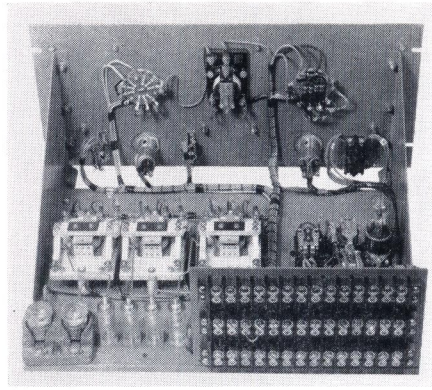


Modulator includes peak limiting amplifier up to 25 db compression, 3000 cycle cut-off filter, microphone amplifier, line input, gain control and front panel microphone connector. 6SJ7 mic stage, 6L7 second stage and line input, 6C5 amp., 6L6 driver and Class B 811A modulators. Model M-3453Y.

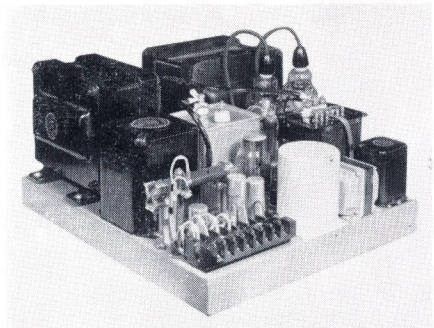
Listed on the next three pages are various models of 250 watt (output) transmitters of the communications type for operation between 2-22 Mc. Described on this page are the major basic units (rear view) that are used in these various models. By following the unit system for many models the purchaser is offered the advantage of standardization of basic design though different models of transmitters are desired. For example, a CW transmitter has the same pertinent units as will be found in the more comprehensive telephone types, but less the modulator, etc.

Each RF chassis may operate on any 2-22 Mc frequency by selecting the proper coil set. Where instant frequency change is not mandatory, the changing coils will suffice. If instant change is desired, then 2 RF decks are used such as in Model M-3449Y (next page).

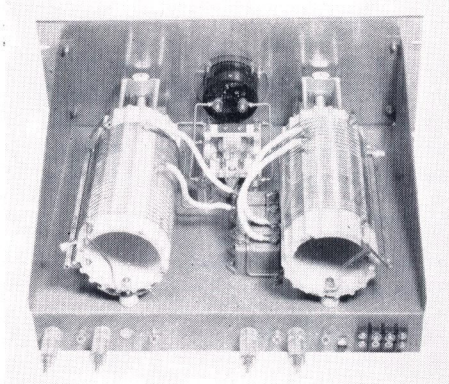
It can be said that these transmitters are straightforward, "work horse" designs that will produce excellent commercial results at low investment.



Control panel used in all models. Used for single or double RF channels. Includes: filament start, plate start, phone/CW, channel selector, filament/plate pilot lights, meter range switch, plate on relay, keying relay, channel changing relays and overload relay. Meter selector switch reads: oscillator plate, IPA grid, IPA plate, PA grid. Model M-3461Y.



Power supply provides high and intermediate voltages to one RF and one modulator unit or two RF units. Includes bias supply for fixed bias on RF units. Output voltages: 1250V DC, 600V DC and approximately 100V DC for bias. For 115 volts, 50/60 cycles. Tubes: two 866A, one 6X5, 5R4GY. Mounts in base of transmitter cabinet. Model M-3454Y.



Dual channel antenna coupler contains two complete networks that may be arranged in T or L with variable loading condenser. Will match wide variety of impedances from 10 to 300 ohms. Changeover relay and 0-3 RF ammeter is provided. Used with two-channel operation such as in M-3449Y transmitter, next page. Model M-3451Y.



Microphone assembly M-4237 includes dynamic microphone, 7' cable, plug and push to talk desk stand. Plugs into front of modulator unit on transmitter.

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TWO CHANNEL PHONE/CW 250 WATTS OUTPUT

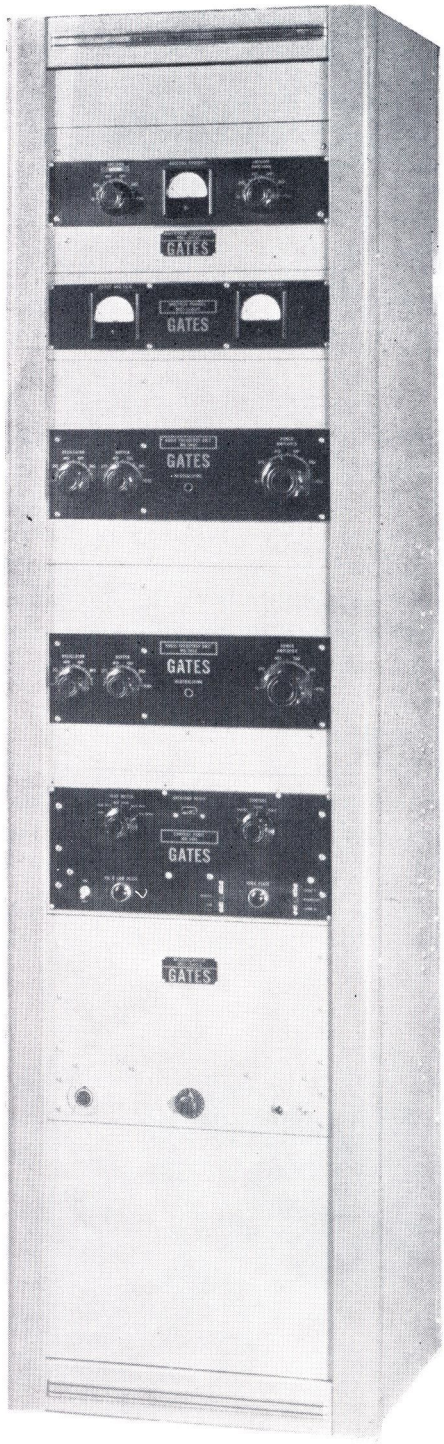
Model M-3449Y

A complete telephone and telegraph transmitter with two radio frequency channels providing instantaneous changeover and therefore multi-band operation on two frequencies. Additional frequencies from 2-22 Mc may be accommodated by use of the plug-in coils sets listed below. Individual units comprising this transmitter are generally described on the preceding page entitled, "250 Watt Unit System Transmitter."

Looking at the transmitter illustrations at the right from top to bottom are the following units completely inter-wired and ready to use:

Dual channel antenna coupling unit, M-3451Y
Meter panel, M-3460Y
Radio frequency unit, M-3452Y
Control panel, M-3461Y
Modulator unit, M-3453Y
Power supply unit, M-3454Y

Constructed in 84" rack cabinet, completely wired and ready to use.



SPECIFICATIONS

FREQUENCY RANGE: 2-22 Mc by coil selection.

FREQUENCY STABILITY: 0.005% when used with JKO-2 oven or 0.02% when used with H7 crystal and holder.

MODULATION: High level Class B with self-contained peak limiting amplifier and 3000 cycle cutoff filter.

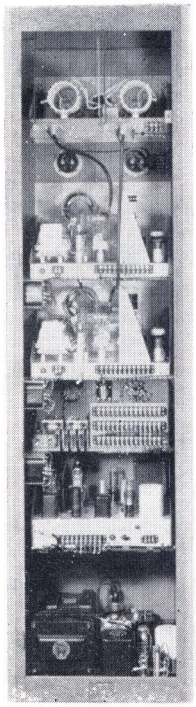
POWER OUTPUT: 250 watts telephone and telegraph.

POWER INPUT: 115 volts, 50/60 cycles.

AF INPUT: Hi-Z for microphone and 600 ohms for line. Push to talk facilities for transmitter On-Off and receiver muting provided.

RF OUTPUT: 2 channels, each 20-300 ohms.

SHIPPIPNG WEIGHT: Export packed, 905 lbs. Export cubage, 78.7.



ORDERING INFORMATION

Two channel telephone and telegraph transmitter with one set of tubes, less crystals		**M-3449Y**
Spare 100% tube complement		**TK-222**
Plug-in coil sets:	**For 2-3 Mc**	**M-3641**
	For 3-4.2 Mc	**M-3642**
	For 4-7.2 Mc	**M-3643**
	For 7-13 Mc	**M-3644**
	For 12-22 Mc	**M-3645**
Crystal and holder for 0.02% accuracy		**H-7**
Crystal and holder for use in JKO-2 oven (listed below) 0.005% accuracy		**H-17**
Temperature controlled oven only for mounting two H-17 crystals		**JKO-2**
Complete push-to-talk microphone assembly		**M-4237**

NOTE: Be sure to specify crystal frequency when ordering. (For 2-11 Mc operation, crystals on frequency. 11-22 Mc, crystals ½ operating frequency.)

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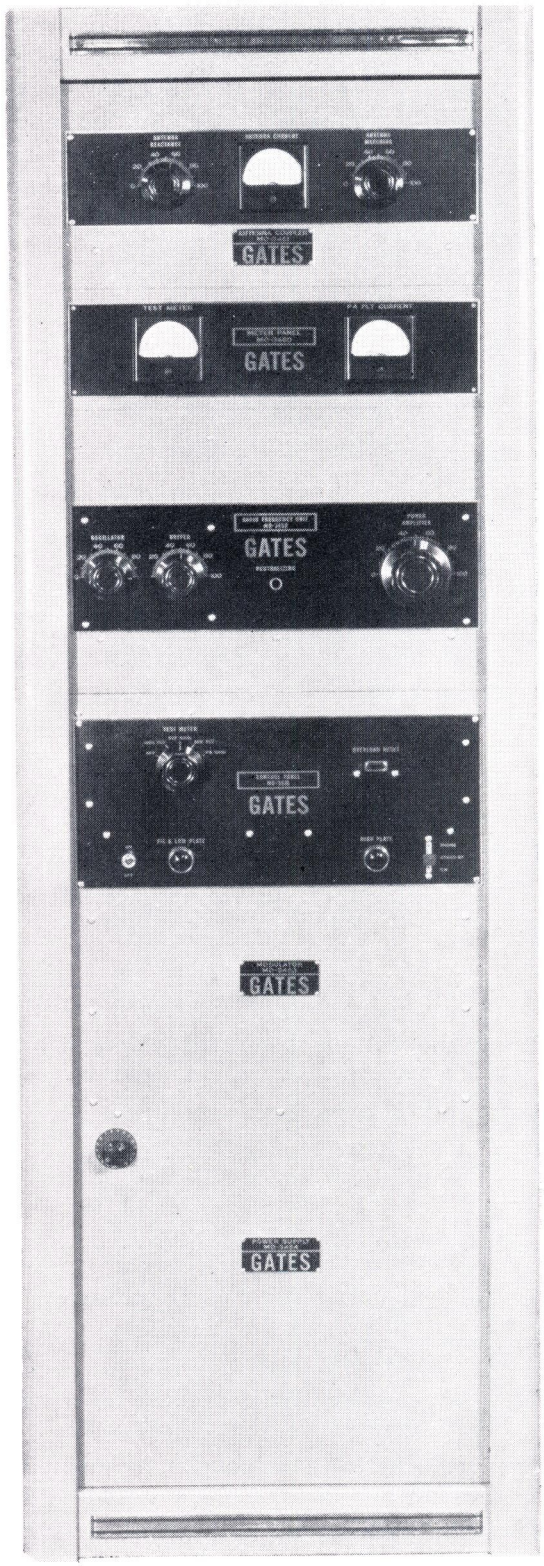
SINGLE CHANNEL PHONE/CW 250 WATTS OUTPUT

Model M-3491Y

Perhaps the majority of radio telephone and telegraph services operate on one channel only. This transmitter provides single frequency operation on any frequency between 2-22 Mc simply by selecting the proper coil set listed at the bottom of the page and the correct crystal. By referring to the illustration at the right, the following units comprising a complete transmitter are installed and inter-wired, ready for use. Reading from top to bottom, they are:

Single channel antenna coupling unit, M-4239
Meter panel, M-3460Y
Radio frequency unit, M-3452Y
Control panel, M-3461Y
Modulator unit, M-3453Y
Power supply unit, M-3454Y

Equipment is mounted in a rack cabinet standing 68" high. May be used with M-4237 microphone assembly and choice of crystals for either 0.02% or 0.005% accuracy.



SPECIFICATIONS

FREQUENCY RANGE: 2-22 Mc by coil selection.

FREQUENCY STABILITY: 0.005% when used with JKO-2 oven, or 0.02% when used with H7 crystal and holder.

MODULATION: High level Class B with self-contained peak limiting amplifier and 3000 cycle cutoff filter.

POWER OUTPUT: 250 watts telephone and telegraph.

AF INPUT: Hi-Z for microphone and 600 ohms for line. Push-to-talk facilities for transmitter On-Off and receiver muting provided.

RF OUTPUT: Single channel, 20-300 ohms.

ORDERING INFORMATION

Single channel telephone and telegraph transmitter with one set of tubes, less crystals	**M-3491Y**
Spare 100% tube complement	**TK-237**
Plug-in coil sets: For 2-3 Mc	**M-3641**
For 3-4.2 Mc	**M-3642**
For 4-7.2 Mc	**M-3643**
For 7-13 Mc	**M-3644**
For 12-22 Mc	**M-3645**
Crystal and holder for 0.02% accuracy	**H-7**
Crystal and holder for use in JKO-2 oven (listed below), 0.005% accuracy	**H-17**
Temperature controlled oven only for mounting H-17 crystals	**JKO-2**
Complete push-to-talk microphone assembly	**M-4237**

NOTE: Be sure to specify crystal frequency when ordering. (For 2-11 Mc operation, crystals on frequency. 11-22 Mc, crystals ½ operating frequency.)

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SINGLE CHANNEL PHONE/CW 250 WATTS OUTPUT

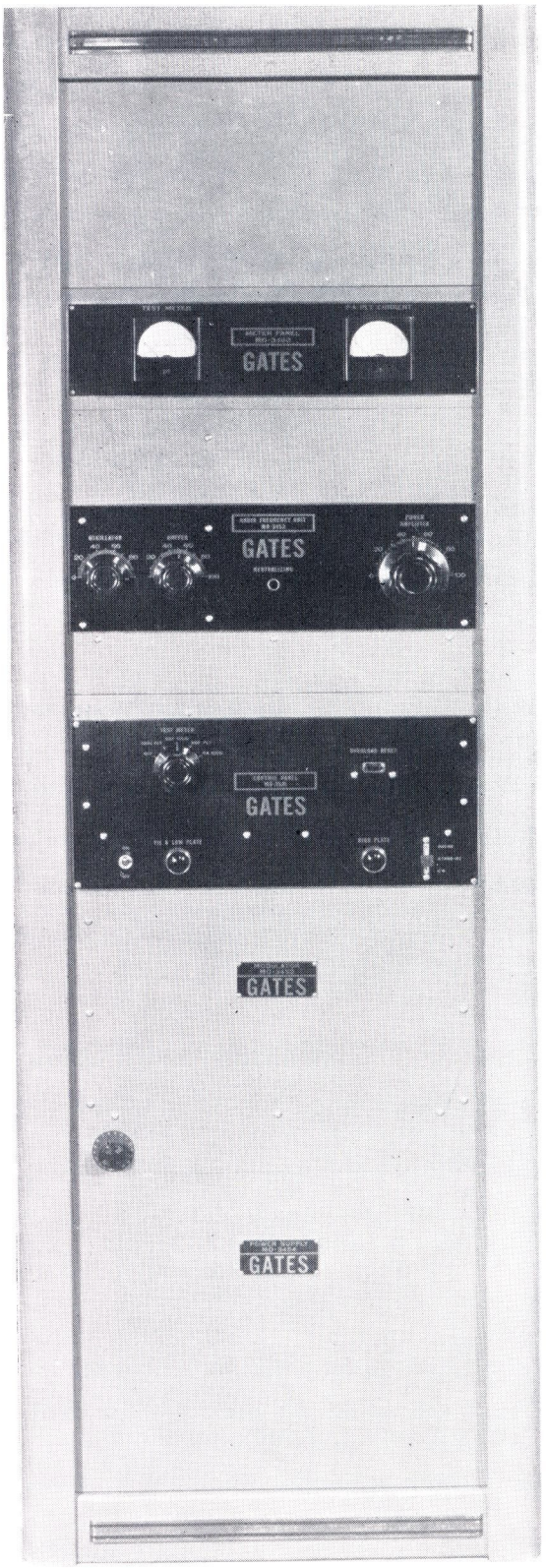
Model M-3680Y

This transmitter is identical in every respect to the M-3491Y described on the preceding page, only the single channel antenna coupling unit has been eliminated. This means that the output impedance from the radio frequency unit of 50 ohms is the final output impedance of the transmitter. Should be used for any single channel telephone and telegraph operation where the antenna coupling equipment is remotely located from the transmitter and transmission of power between the transmitter and antenna coupling unit is at 50 ohms impedance.

Looking at the illustration to the right, from top to bottom, the following units are incorporated, inter-wired and ready for use:

Blank panel
Meter panel, M-3460Y
Radio Frequency unit, M-3452Y
Control panel, M-3461Y
Modulator unit, M-3453Y
Power supply unit, M-3454Y

All equipment is mounted in a standard rack cabinet 68" high. Equipment may be used with H7 crystal and holder for 0.02% accuracy, or H17 in JKO-2 temperature controlled oven for 0.005% accuracy.



SPECIFICATIONS

FREQUENCY RANGE: 2-22 Mc by coil selection.

FREQUENCY STABILITY: 0.005% when used with JKO-2 oven, or 0.02% when used with H7 crystal and holder.

MODULATION: High level Class B with self-contained peak limiting amplifier and 3000 cycle cutoff filter.

POWER OUTPUT: 250 watts telephone and telegraph.

POWER INPUT: 115 volts, 50/60 cycles.

AF INPUT: Hi-Z for microphone and 600 ohms for line. Push-to-talk facilities for transmitter On-Off and receiver muting provided.

RF OUTPUT: Single channel, 50 ohms.

ORDERING INFORMATION

Single channel telephone and telegraph transmitter with one set of tubes, less crystals		**M-3680Y**
Spare 100% tube complement		**TK-237**
Plug-in coil sets:	**For 2-3 Mc**	**M-3641**
	For 3-4.2 Mc	**M-3642**
	For 4-7.2 Mc	**M-3643**
	For 7-13 Mc	**M-3644**
	For 12-22 Mc	**M-3645**
Crystal and holder for 0.02% accuracy		**H-7**
Crystal and holder for use in JKO-2 oven (listed below), 0.005% accuracy		**H-17**
Temperature controlled oven only for mounting H-17 crystals		**JKO-2**
Single channel antenna coupler for mounting adjacent to transmission line if antenna remote from transmitter		**M-4239**
Complete push-to-talk microphone assembly		**M-4237**

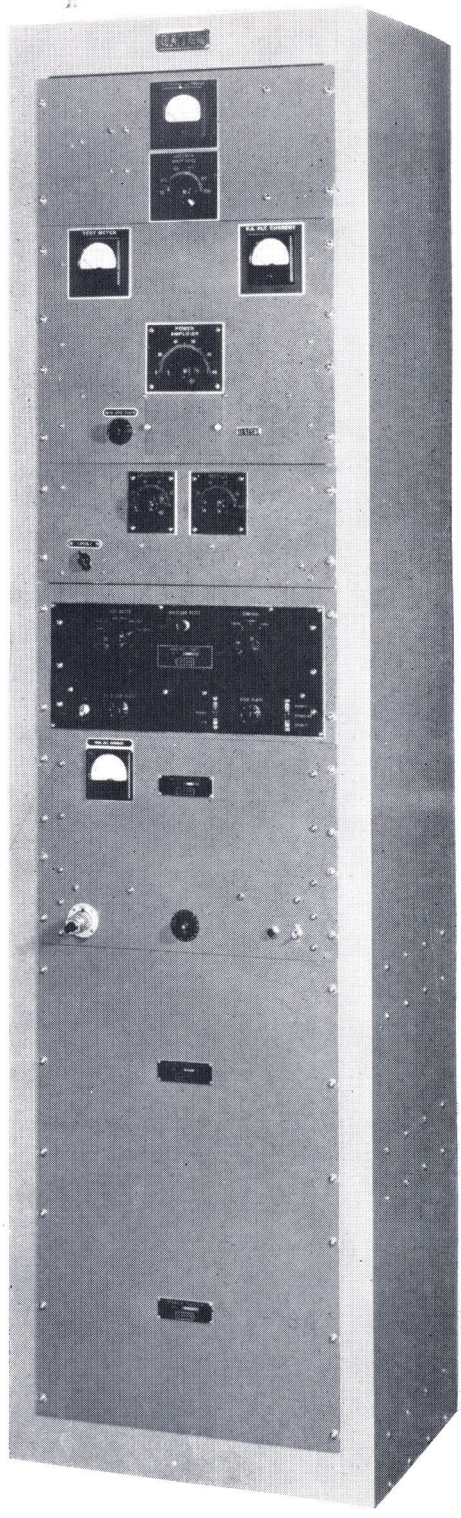
NOTE: Be sure to specify crystal frequency when ordering. (For 2-11 Mc operation, crystals on frequency. 11-22 Mc, crystals ½ operating frequency.

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MODEL CMW-1 2-22 MC TRANSMITTER

(700 Watts Input, Telephone and Telegraph)



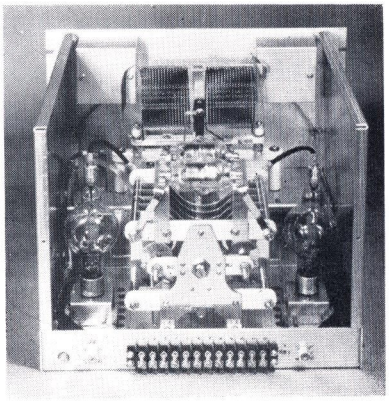
Here is a work horse design in medium power communications transmitter. For heavy duty service, CMW-1 design relies on time-proven methods, fully understood by all radio men to do the job called upon and **do it well.**

Conservatively rated at 700 watts input, CMW-1 will actually do much more, when called upon. Use of 100TH tubes in both power amplifiers and modulators illustrate well the inbuilt conservatism.

In the audio system is embodied an effective limiter and audio filter to meet current regulations and equally important to obtain full effectiveness through high modulation and sharp voice quality.

RF output coupling matches a wide variety of antennas or transmission lines. The relay system both for protection and operations control is complete in every detail. Total shielding of the output tank assures excellent harmonic attenuation.

CMW-1 is a transmitter that can take it and provide results demanded in this modern day of heavy communications schedules.



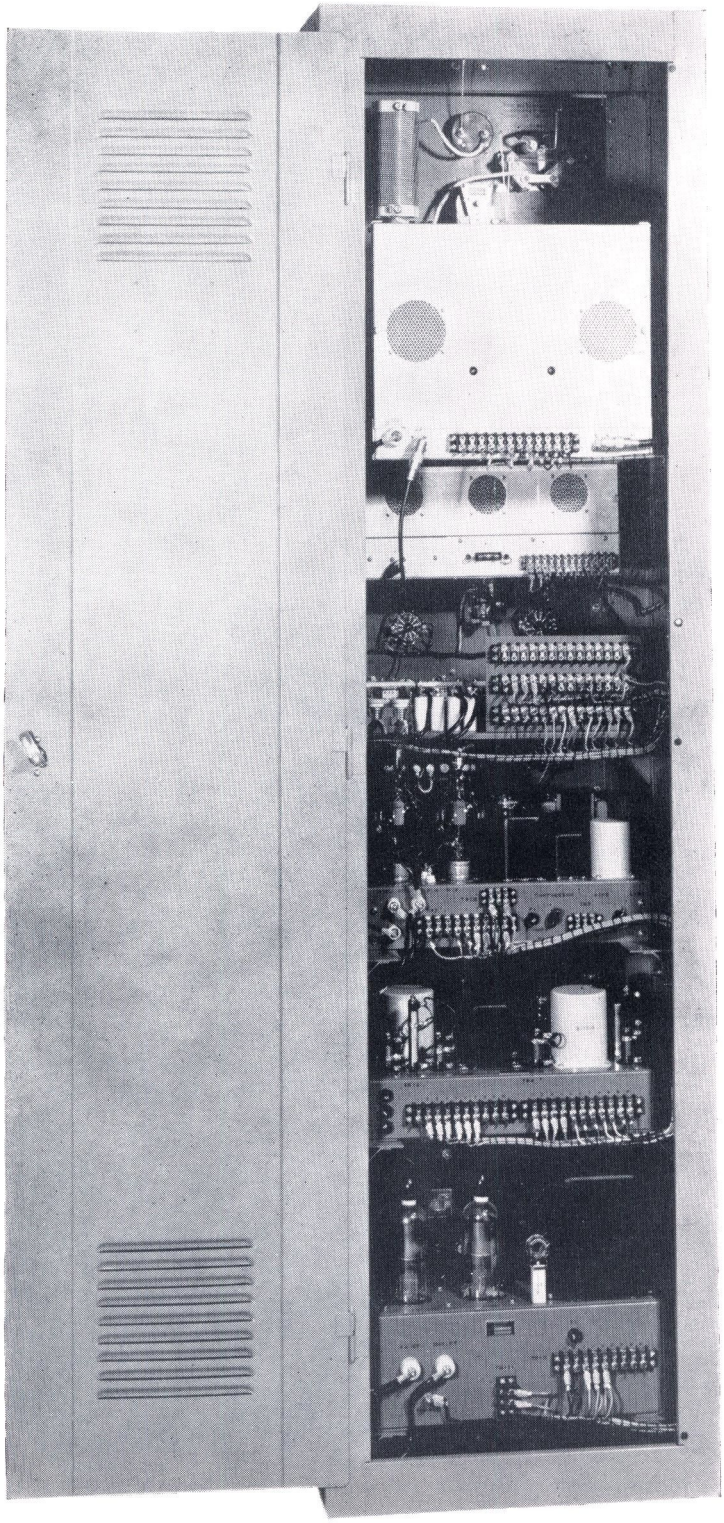
Left, inner view with shield removed from the push-pull power amplifier.

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CMW-1 TRANSMITTER

(700 Watts Input, 2-22 Mc.)



The CMW-1 transmitter is constructed in a reinforced steel cabinet with full length rear door, 84" high, 23" wide and 18" deep with door swing of 20".

— Antenna coupler for wide range of antennas. Includes changeover relay for receiver.

— RF power amplifier with push-pull 100TH tubes and 100% shielded. Output is link coupled to antenna coupler.

— Oscillator-IPA Section is link coupled to power amplifier.

— Relay-Control Panel includes 100% overload protection, time delay, keying relay, local remote control and start-stop functions.

— Audio-Modulator Section includes limiter, filter and both microphone and line input positions.

— Low voltage power supply section for LV plate supply and modulator bias.

— Main high voltage full wave power supply with two 8008 rectifier tubes for maximum reliability.

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GENERAL INFORMATION

(Model CMW-1)

RADIO FREQUENCY section is constructed in two sections, mounted one above the other. Two crystals, either in open or a temperature controlled oven, are switch selectable into a 6AG7 Colpritts oscillator. Added crystals may be quickly plugged in. The 4-65A IPA provides abundant drive to the final Class C amplifier, consisting of pushpull 100TH tubes link coupled to the IPA stage. The PA section is 100% shielded for stability and low spurious radiation. Frequency range is covered by five sets of plug-in coils to extend continuously over the entire 2-22 Mc range.

MODULATOR-audio section is complete in every detail. Input accommodates both a low level dynamic microphone with push-to-talk switch and 600 ohm line. Limiter permits 100% modulation without over-modulation and allowing much higher average voice level, equivalent to greater power output. A 3000 cycle filter sharply cuts off all audio response above 3000 cycles. Modulators are Class B 100TH tubes interchangeable with the RF power tubes. Power supply for all but the modulators is self contained on the modulator deck.

METERING of all needed circuits is accomplished with four meters: (1) PA plate current, (2) modulator current, (3) antenna or line current, and (4) a multi-meter switch selectable to grid and plate circuits of the measurable radio frequency stages.

POWER SUPPLIES include main high voltage supply with dual 8008 tubes, LV audio supply and modulator bias supply.

RELAY CONTROL is an outstanding CMW-1 feature. Relay complement totals 8 in all. These are: (a) time delay, (b) plate on contactor, (c) RF overload, (d) phone/CW relay, (e) keying relay, (f) transmit-receive antenna changeover relay, (g) Channel 1 relay, and (h) Channel 2 relay. Though the CMW-1 transmitter, as supplied, has one RF channel, provision for changeover to a second RF channel is incorporated.

LOCAL REMOTE CONTROL provision is made by providing terminal connections for remote operation of: (a) plate on, (b) phone on, (c) channel on, (d) filament on light, and (e) plate on light.

ANTENNA COUPLER assures matching over-impedance ranges from 30 to 600 ohms with either a "Tee", "L" or "Pi" network. Where desired, the output may be coupled directly to the PA output link having an impedance of about 50 ohms. Fixed and variable capacitors are circuit arranged into a tapered coil. A 0-5 RF ammeter is part of the antenna coupler. The changeover relay is located near the coupler at the top of the cabinet.

MICROPHONE is optional equipment and the M4576 dynamic microphone with push-to-talk desk stand is recommended for this equipment. This microphone is illustrated herein.

KEYING is in the oscillator cathode. A keying relay is provided and speeds up to 60 WPM are possible.

PERFORMANCE: The CMW-1 transmitter rated at 700 watts input is indeed conservative. The experienced engineer will quickly note the much higher power capabilities of the 100TH tubes. With limiter and filter in the audio system, high levels of average modulation with no concern of sideband splash greatly increase the effectiveness. In no place has other than the finest of materials been employed. Generous RF driving power indicates ease of modulation at all frequencies. Link coupling between the IPA and power amplifiers and between the PA tank and antenna coupler adds greatly to stability and quick reliable tune-up.

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SPECIFICATIONS (CMW-1 Transmitter)

FREQUENCY RANGE: 2-22 Mc.

FREQUENCY STABILITY: Where used with JK02 temperature controlled oven (2 crystals in one oven), stability is .005%. Where used with H-7 holder, stability is .02%.

POWER INPUT: Rated at 700 watts all frequencies.

MODULATION: High level Class B.

AUDIO RESPONSE: 150-3000 cycles ±2½ db. Sharp cut-off above 3000 cycles.

AUDIO DISTORTION: 8% or less 150-3000 cycles.

NOISE: 45 db or better below 100% modulation.

MICROPHONE INPUT: Hi-Z for either dynamic or crystal microphone.

LINE INPUT: 600 ohms.

KEYING SPEED: 60 WPM.

RF OUTPUT IMPEDANCE: 30-600 ohms unbalanced or 50/70 ohms balanced.

POWER INPUT: 115 volts, 50/60 cycles. Carrier off, 575 watts; carrier on (0 modulation), 1610 watts; at average modulation, 1875 watts, and at 95% modulation, 2175 watts.

SIZE: 84" high, 23" wide, 18" deep. Door swing 20".

FINISH: Medium gloss gray panels. Dark gray cabinet.

WEIGHT: Net 500 lbs. Packed 770 lbs.

CUBAGE: 28.

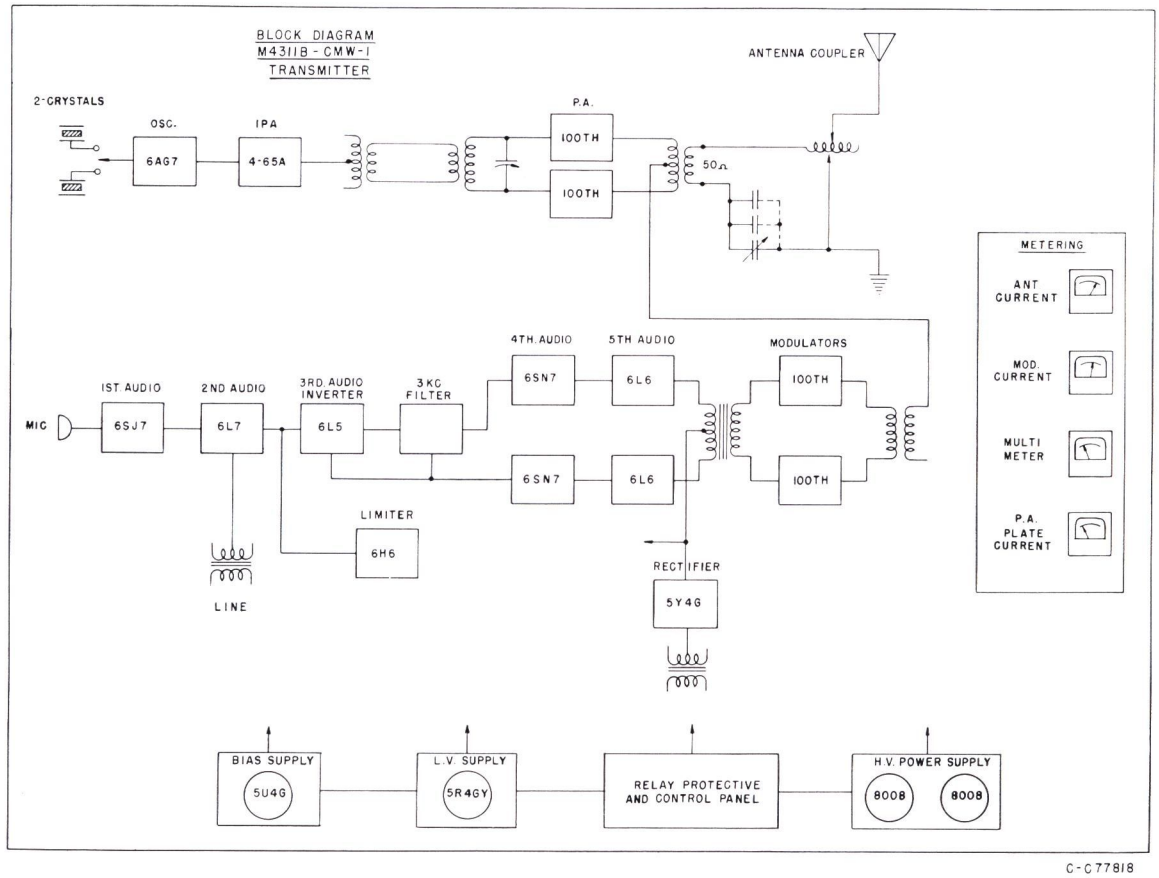
TUBES: Oscillators, 6AG7.
Int. Power Amplifier, 4-65A.
Power Amplifier, (2) 100TH.
1st Audio, 6SJ7.
2nd Audio, 6L7.
3rd Audio, 6C5.
4th Audio, (2) 6L6.
Modulator, (2) 100TH.
Limiter Tube, 6H6.
Phase Inverter, 6SN7.
Rectifiers, 5V4G, 5R4GY, 5U4G, (2) 8008.
Voltage Regulator, OD3/VR150.

ORDERING INFORMATION

CMW-1 transmitter complete with tubes, coil sets for 2-22 Mc, less microphone and crystals M-4311B
Microphone with push-to-talk desk stand, 7' cable and plug M-4576B
Spare 100% tube complement TK-137
Crystal and holder for .02% accuracy* H-7
Temperature controlled oven for two H-7 crystals JK02

*** State frequency desired when ordering.**

NOTE: This model approved by Federal Civil Defense Administration.

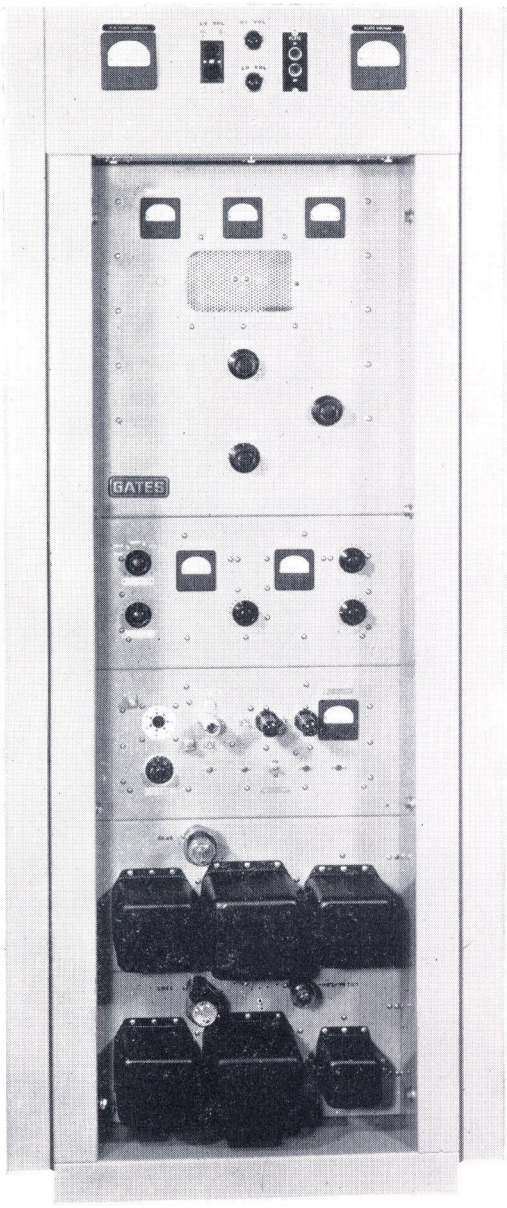


C-C77818

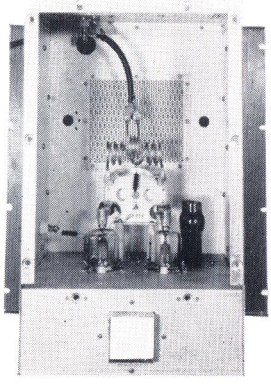
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GATES

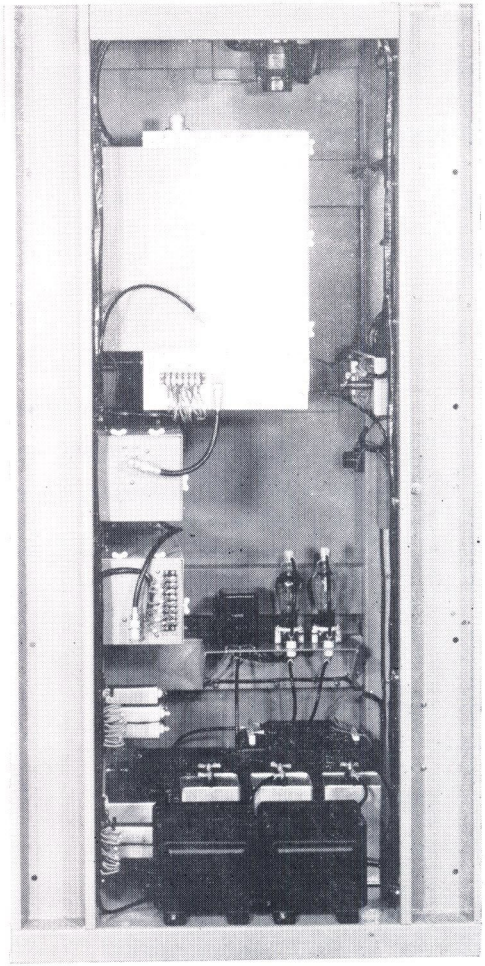
250/300 WATT SPECIAL PURPOSE VHF TRANSMITTER



A special transmitter with particular attention given to the requirements of Guided Missile and Doppler techniques in tracking and velocity measurements. Features rugged design, low harmonic radiation and extremely low carrier noise level along with exacting frequency stability.



Interior of completely shielded power amplifier section. Filaments of power amplifiers are supplied by direct current for lower carrier noise.



Rear view illustrates extreme care in design and manufacture in both interstage shielding and rugged construction.

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250/300 WATT VHF PRECISION TRANSMITTER

This transmitter has been designed for special applications where highly stable equipment is mandatory such as in Guided Missile projects or any application where a better than the best commercial standard is required.

Second and higher order harmonics are attenuated 80 db or better by special attention to shielding and RF circuitry. Carrier noise is also maintained at 80 db or better below the carrier fundamental. This, in part, is accomplished by application of direct current to the filaments of the final power amplifier stage. — Carrier frequency can be maintained at one part in 10 million over a period of at least 15 minutes and 10 parts in one million over periods of 8 hours or longer.

Designed for continuous duty, the M-5077 transmitter is fully metered and fully protected with a generous relay and circuit breaker system.

Also available are the M-5551 Dovap transmitter with frequency range of 30 to 40 Mc, and the M-5552 50 watt transmitter. (Same basic design as the M-5077). Write for specific information on these models.

SPECIFICATIONS

POWER OUTPUT: 250/300 watts continuous duty.

OUTPUT IMPEDANCE: 51 ohms.

POWER INPUT: 115 volts, 50/60 cycles, from power line capable of 1.5KW.

SIZE: 66" high, 27½" wide, 36" deep.
Door swing 20".

WEIGHT: Net 750 lbs. Packed 990 lbs.
Export wt. 1800 lbs. packed. Cubage 75.8.

OSCILLATION: Precision crystal control at fundamental approximately 4000 Kc.

FREQUENCY RANGE OF TRANSMITTER: 70-80 Mc as ordered.

METERING: 6 meters both direct and multimeter check all tube functions.

COOLING: Forced air to final PA chamber. Balance convex.

NOISE: 80 db or better below carrier.

RF HARMONICS: 80 db or better below fundamental (all harmonics) into 50 ohm resistive load.

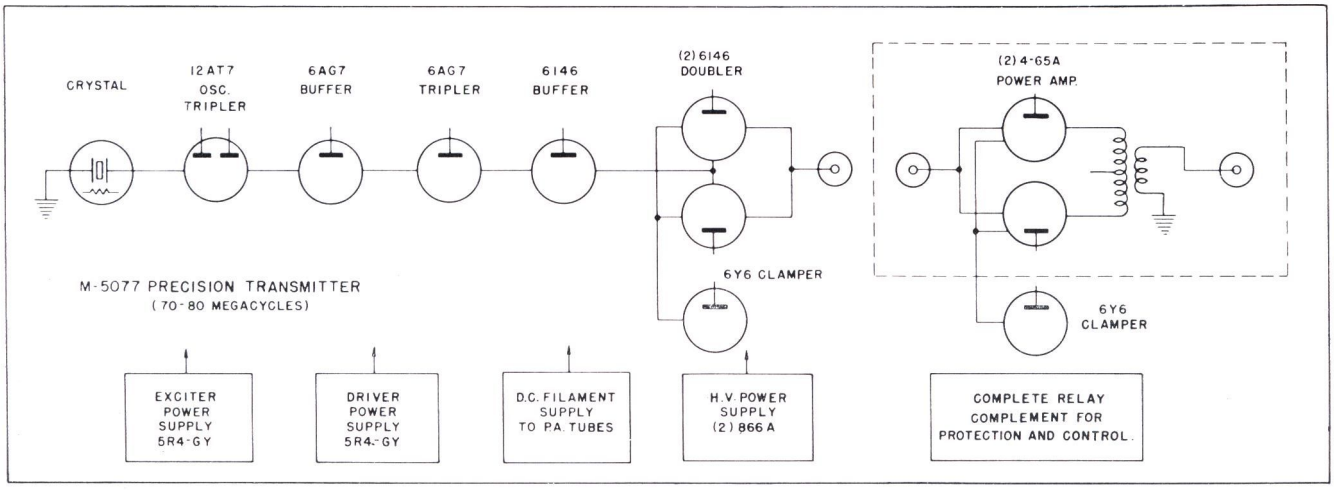
FREQUENCY STABILITY: One part in 10 million for 15-minute periods. 10 parts in one million over extended periods.

KEYING: Carrier may be interrupted with good square top wave form up to 60 WPM or 300 carrier breaks per minute.

TUBES: 3 each 6146; 2 each 6AG7, 4-65A, 6Y6G, VR150, 5R4GY, 866A; one 12AT7.

ORDERING INFORMATION

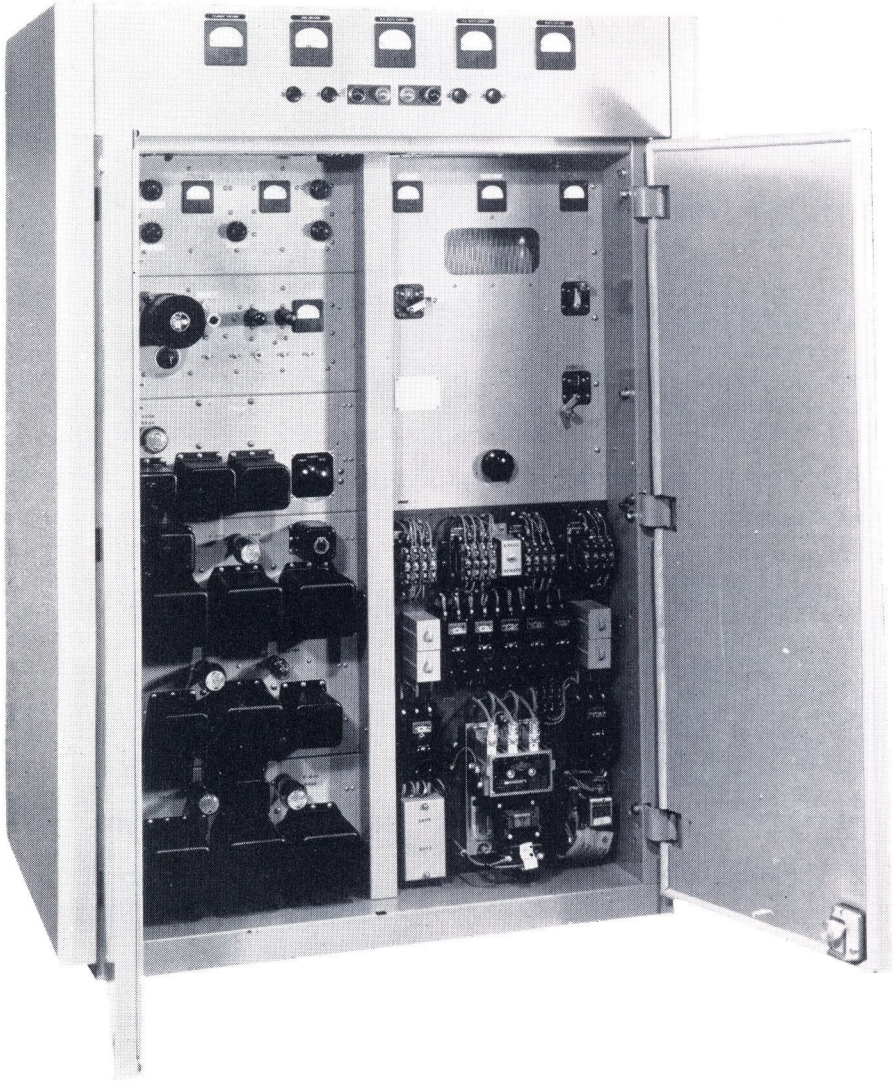
Transmitter with tubes, crystal and oven	**M-5077**
Crystal oven only (less crystal)	**JKO7E**
Crystal (for above oven), state carrier frequency	**H18**
Spare 100% tube complement for M-5077 transmitter	**TK-199**



If You Didn't Get This From My Site,
Then It Was Stolen From...
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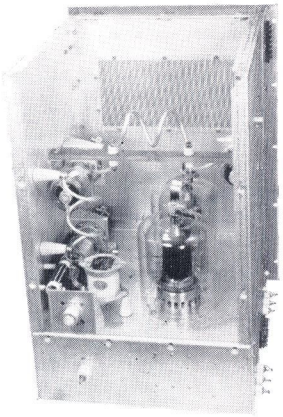
GATES

2KW VHF PRECISION TRANSMITTER

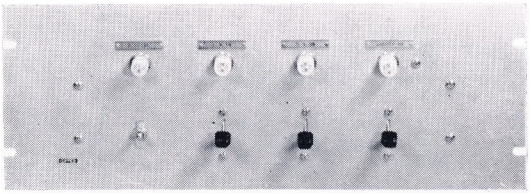


The Doppler technique used for velocity measurements in the testing of guided missiles and many similar applications requires a precision transmitter with the highest quality standards. The Gates M-5076 transmitter is designed for the 30-40 Mc band, produces a full 2KW output at continuous duty and has in-built features that meet exacting demands.

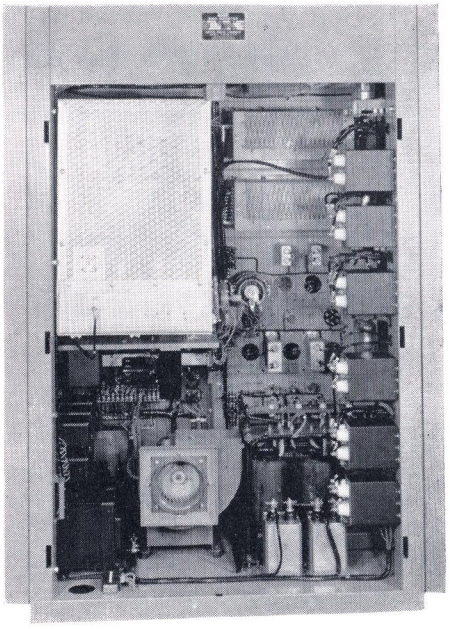
Rugged design including heavy duty front doors, low spurious radiation, low carrier noise and accurate frequency stability, provides a transmitter already proven in strategic services.



Power Amplifier Unit.



Remote control panel allows operation on as much as 10 miles of line.



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2KW VHF PRECISION TRANSMITTER

Harmonic or spurious radiation, by use of shielding and choice of circuitry, at second and higher order harmonics is 80 db or better below fundamental carrier. Separate direct current filament supplies are provided for each of the 4-1000A power amplifier tubes, which along with the 3-phase plate supply assures carrier noise reduction of 80 db or better. Generous use of intermediate power supplies for exciter, driver, final PA screen and bias adds to both good regulation and reliability. A remote control unit as standard equipment, when operated on two standard telephone pairs, permits operation on as much as 10 miles of line. Transmitter may be turned on and off and keyed remotely. Carrier frequency may be held to one part in 10 million for 15-minute periods and 10 parts in one million for extended periods of 8 hours or longer.

SPECIFICATIONS

POWER OUTPUT: Rated 2KW continuous but may be operated up to 4KW with reasonable off-on cycles.

OUTPUT IMPEDANCE: 51 ohms.

POWER INPUT: 230 volts, 50/60 cycles, 3-phase, with suggested 20KW primary source for best regulation. 115 volts required for inner cabinet service lights used.

SIZE: 66" high, 47" wide, 34½" deep.
Back door swing 20".

WEIGHT: Net 1400 lbs. Packed 1900 lbs.
Export wt. 2200 lbs. packed. Cubage 124.9.

OSCILLATOR: Precision crystal controlled at crystal frequency of approximately 4000 Kc.

FREQUENCY RANGE: 30-40 Mc as ordered.

METERING: 11 meters both direct and multimeter check all tube functions. An output meter indicates power output in watts and VSWR.

COOLING: Dual squirrel-cage blower for direct PA tube cooling and second for over-all cooling. Air intake is spun glass replaceable filter.

RF HARMONICS: 80 db or better below fundamental at second and higher order harmonics.

NOISE: 80 db or better below carrier.

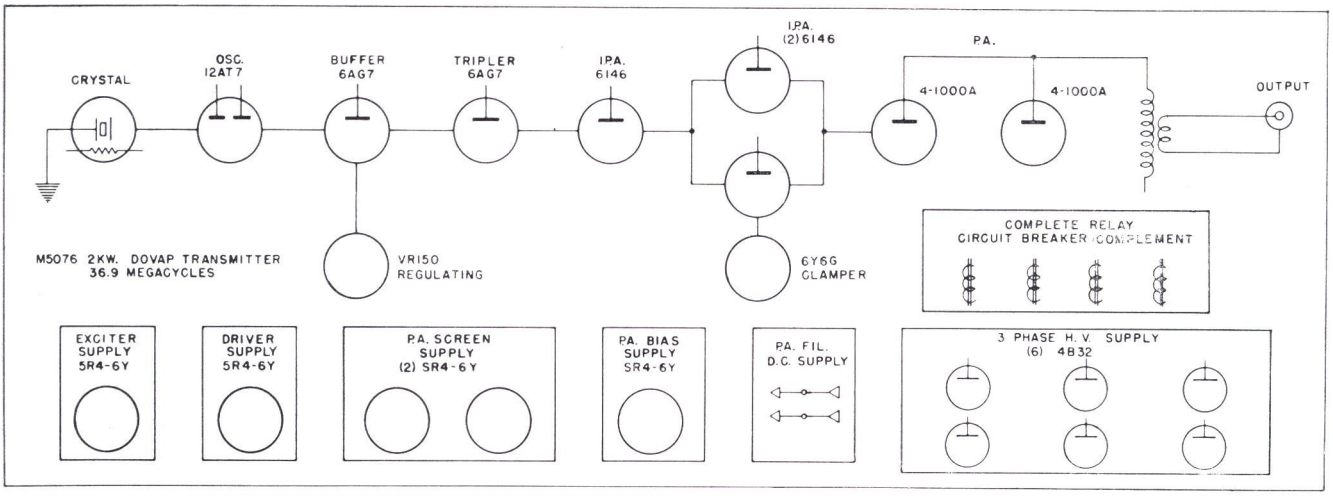
KEYING: Carrier may be interrupted with good square top wave form at 60 WPM or 300 carrier breaks per minute.

FREQUENCY STABILITY: One part in 10 million for 15-minute periods. 10 parts in one million for extended periods of 8 hours or longer.

TUBES: (6) 4B32, (5) 5R4G, (3) 6146, 2 each 6AG7, 4-1000A, VR150, 1 each 6Y6G, 12AT7 and 6X56T (in remote control unit).

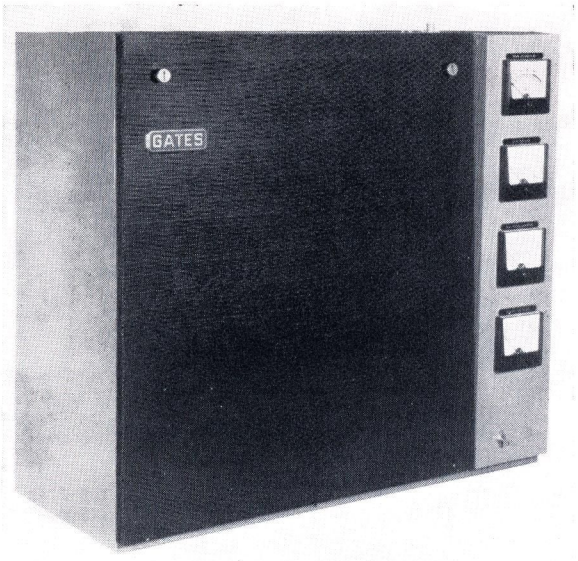
ORDERING INFORMATION

Transmitter with tubes, crystal and oven	**M-5076**
Crystal oven (less crystal)	**JKO7E**
Crystal (or above oven), state carrier frequency	**H-18**
Spare 100% tube complement for M-5076 transmitter	**TK-198**



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GATES



BFR-50C FM RELAY TRANSMITTER

Designed for 50 watt FM service and available at any frequency between 40 and 220 Mc and for any frequency swing. Models below 80 Mc have maximum swing of ±40 Kc or less, as desired. Above 80 Mc may be ±75 Kc or less, as desired. General specifications of this model are found on Pages 64 and 65 (Model BF-E-50B). This model differs as outlined above and has (1) 5894 tube, (1) 6AQ5 tube, and (1) 5R4GYA tube added.

Multiplex is also available as an optional accessory in single or dual sub-channels. In relay service this offers many possibilities such as a talking channel or second program channel.

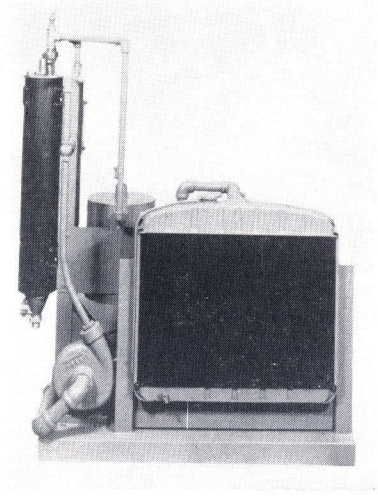
Where the full, wide frequency response is not desired, the BFR-50C transmitter may be used with the communications "Limiter/Filter Amplifier" listed on Page 206.

ORDERING INFORMATION

50 watt relay transmitter for 40-220 Mc operation, with tubes, crystal and oven* **BFR-50C**
Spare 100% tube kit for above **TK-310**
Single multiplex sub-channel **M-5633A**
Dual multiplex sub-channel **M-5633**

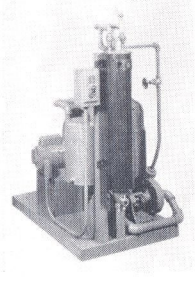
* State carrier frequency and frequency swing desired, when ordering.

VHF 5KW DUMMY ANTENNA (heat exchanger)



Self-contained, water cooled 5KW antenna to operate up to 5KW power and up to 500 Mc. Impedance 51 ohms. Consists of 1 HP electric motor driven pump and fan which cools water circulating through radiator to dummy antenna. Overflow reservoir provided. For testing high frequency transmitter in VHF and UHF bands. Has direct reading power indicating watt meter.

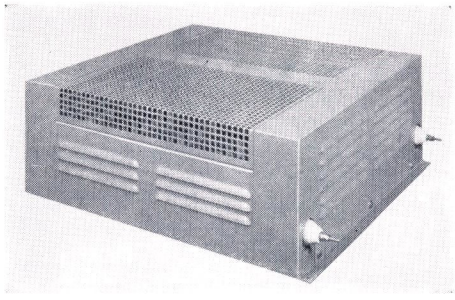
SIZE: 25" wide, 39½" deep, 36" high.
POWER: 5KW continuous at 500 Mc (half rating if AM modulated).
RADIATOR: 18 quarts water or approved anti-freeze.
COOLING: 900 BTU.



VHF Dummy Antenna **M-5508**

NOTE: Other higher power rating heat exchangers are available on special order. Prompt quotations on receipt of (a) power rating, (b) impedance, and (c) frequency of operation.

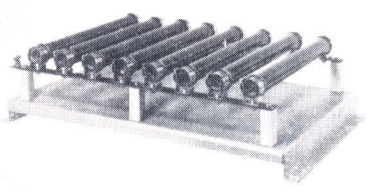
AIR COOLED 5KW DUMMY ANTENNA



Though designed primarily as a dummy antenna for testing 5KW broadcast transmitters, this unit may be used between 200 Kc and 6 Mc with excellent resuts. Includes series of wire-wound non-inductive resistance elements. Power rating based on 100% modulation at 5KW. Fully housed as illustrated. Size: 27½"x 26"x10¼" high.

Dummy Antenna, 51 ohms **DU-551**
Dummy Antenna, 70 ohms **DU-570**

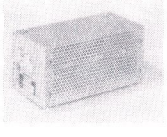
AIR COOLED 1KW DUMMY ANTENNA



This unit may be used for any transmitter between 200 Kc and 6 Mc at a maximum power rating of 1KW, 100% modulated. Consists of non-inductive resistors heavily banded together to arrive at correct load resistance. Size: 20¼" x 12 5/8" x 5" high.

Dummy Antenna, 51 ohms **DU-151**
Dummy Antenna, 70 ohms **DU-170**

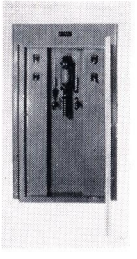
VHF 10-WATT DUMMY

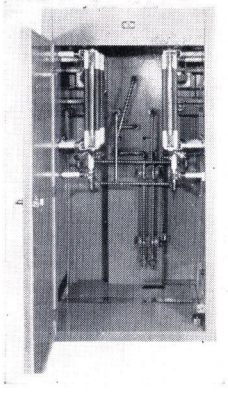


Designed for measuring BF-E-10B transmitter, listed on Page 64. Power rating 10 watts at 50-250 Mc. Has Type N connector for attaching RG-8U cable. Ideal for measuring low powered VHF transmitters including many types of police transmitters, etc. Impedance 50 ohms.

VHF Dummy Antenna **M-5645**

WATER COOLED DUMMY ANTENNAS





Available in 25KW and 50KW designs for broadcast and high frequency service. Ratings are at 100% amplitude modulation and 50% may be added where unmodulated. — High frequency models are provided with variable coil and variable capacitor elements for tuning out reactance. Medium frequency models are straight resistance elements.

Paralleled wire resistance elements are precision supported in a water-tight glass enclosure around which filtered water is evenly distributed. Dual thermometers measure water temperature in and out and the differential is measured in power.

SPECIFICATIONS

WATER FLOW: (50KW) 15 gal. per min.
(25KW) 12 gal. per min.

LOAD RESISTANCE: Available in 50, 70, 150, 300 and 600 ohms, as ordered. High frequency models available 300 and 600 ohms only.

SIZE: 78" high, 42" wide, 48½ deep.

ORDERING INFORMATION

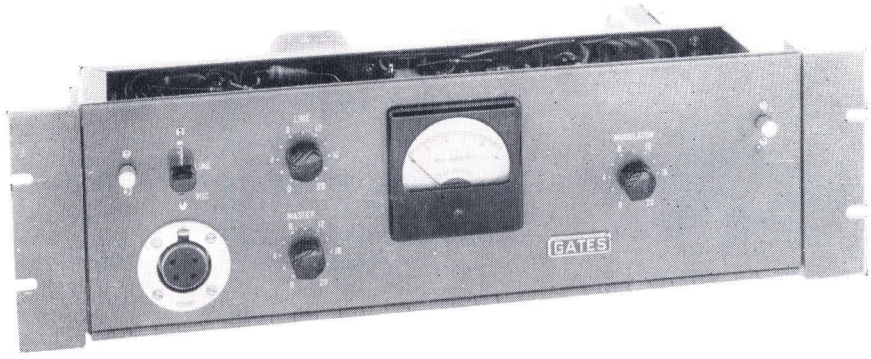
25KW model, 540-1600 Kc. **M-4750A**
25KW model, 2-25 Mc **M-4750**
50KW model, 540-1600 Kc **M-5497**
50KW model, 2-25 Mc **M-5497A**

Above models built to order. Be sure and state power rating and frequency when ordering.

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GATES

COMMUNICATIONS — LIMITER/FILTER AMPLIFIER



Designed to provide microphone and line input to any communications transmitter. Embodies both limiting amplifier and high frequency cut-off filter to meet present FCC specifications. Ideal for use with new transmitters or existing communications transmitters in modernizing them to meet current FCC requirements by reducing high frequency response above 3000 cycles, and providing a fast acting limiting amplifier to prevent over-modulation of the transmitter.

Provides input circuits for either a high impedance microphone or 600 ohm line — switchable from front panel. Gain controls are provided for adjusting level of: (a) input line, (b) master gain and microphone level, and (c) input level to transmitter. A 3″ meter is provided to indicate compression point.

Available in two types. M-5263 has a maximum output of +18 dbm at 600 ohms. M-5263A has a maximum output of 75 volts RMS for push-pull 100,000 ohm grids. Both models have self-contained power supply.

SPECIFICATIONS

INPUT IMPEDANCES: Mic. Hi-Z. Line 600 ohms.
OUTPUT IMPEDANCES: M-5263, 600 ohms. M-5263A, 100,000 ohms.
GAIN: M-5263, from line to output 56 db, from mic to output 86 db +3 db. M-5263A, line to output 42.5 db, mic to output 72 db +3 db.
COMPRESSION: (Min. threshold) mic −63 db +3 db. Line −33 db +3 db.
NOISE: 45 db or better below +18 dbm output. Measured with input of −55 dbm and 5 db compression.
DISTORTION: At compression levels up to +20 db does not exceed 5%. At compression levels up to 30 db does not exceed 10%.
FREQUENCY RESPONSE: With high frequency filter insert at all times, essentially flat at 200-2500 cycles. Down 10 db at 100 and 3300 cycles. Down 20 db at 60 and 4000 cycles. Down 30 db at 35 and 4000 cycles. Down 40 db at 20 and 4800 cycles.
POWER: 115 volts, 50/60 cycles, approximately 40 watts.
TUBES: One each, 6X4, 6AK6, 5879, OA2; two each 12AT7.

ORDERING INFORMATION

Communications Amplifier, less tubes	**M-5263**
Communications Amplifier, less tubes	**M-5263A**
100% tube kit	**TK-235**

SELECTIVE (HETERODYNE FILTER) AMPLIFIER



SPECIFICATIONS

INPUT IMPEDANCE: 600 ohms.
INPUT LEVEL: Approximately 0 VU.
FREQUENCY RESPONSE: +1 db 20-20,000 cycles.
DISTORTION: 1½% or less 20-20,000 cycles at +18 dbm.
NOISE: 70 db or better below +18 dbm.
REJECTION: 40 db up at 220 cycles and 50 db up at 220-20,000 cycles.
TUBES: Four 6SN7, three 6SJ7, one each OC3, OD3 and 5Y3GT.
SIZE: 19″ wide, 5¼″ high, 16½″ deep.
POWER: 115 volts, 50/60 cycles at approximately 60 watts.
SHIPPING WEIGHT: 35 lbs.

Where receiving high frequency signals, the heterodyning of closely associated incoming signals, or two receivers beating at an audio rate, causes receiving difficulties which can often be either greatly improved or completely corrected by the use of the M3922 selective amplifier. Where the interference tone remains constant, the elimination of any single audio frequency between 20-20,000 cycles is possible. If several interference tones are present, selective amplifiers may be placed in series and each undesirable tone reduced or eliminated so that readability of the received signal is greatly improved.

Basic principle is that of a selective audio filter, usually attached ahead of the audio system in the receiver or where attached to the 600 ohm output, a fixed pad should be inserted to provide input level. An additional amplifier is required in the latter case to provide loudspeaker level. Interference tone rejection coverage between 20-20,000 cycles is by means of a calibrated switch plus coarse and fine adjustments. Audio level control, pilot light, fuse and starting switch complete the front panel facilities.

ORDERING INFORMATION

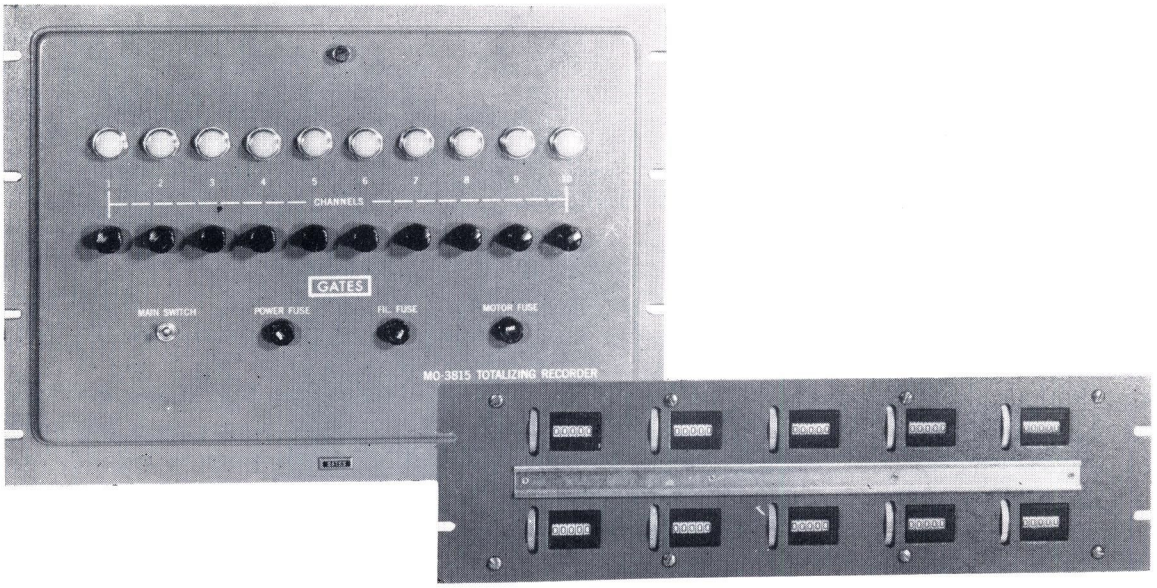
Selective Amplifier with tubes	**M-3922**
Spare 100% tube complement	**M-4138**

Where customer requirements exceed 25 units, write for special quantity prices.

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GATES

TOTALIZING RECORDER



Gates MO-3815 Totalizer is a precision unit used to record the time a signal is at or above a pre-selected value. It is widely used for measuring the field intensity of high frequency signals in propagation tests. It is designed for extreme accuracy and stability over long periods of time. The most discriminating customers have found nothing lacking in its performance.

Used with a high quality receiver and fed off the rectified output. The input voltage range of the Totalizer is 0 to −10 volts DC. Any of the ten channels may be set to any voltage within this range. The sensitivity of the Totalizer is guaranteed to be within .05 volts DC input, however average readings are from .002 to .005 volts. This sensitivity is the difference in the voltage required to energize the channel and to de-energize it. Thus, a channel may be set up to energize with nine volts input and will de-energize when the signal drops to 8.998 volts. The isolation between any or all of the ten channels is great enough to permit setting them up in an increasing sequence of .05 volts apart, yet no interaction of channels will occur.

Each channel, when energized, starts a synchronous one RPM motor that drives a Veeder-Root counter. The counter reads in tenths of minutes and will total up to 9,999.9 minutes. A front panel reset wheel allows resetting from any reading to zero with one revolution of the wheel. The control unit and the counter unit are separate.

CONSTRUCTION: Totalizer recorder: 14"x19" cast aluminum panel and shelf with drop down front door for component servicing. Finish, gray. Counter panel: 5¼"x19". Finish, gray.

TUBES: Eleven 6SL7, ten 6SJ7, one each 6Y6G, 6SN7GT, OD3.

RELAYS: Hermetically sealed.

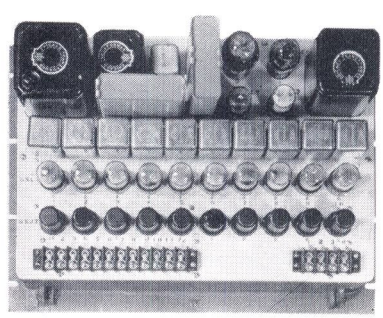
POWER: 115 volts, 60 cycles, approximately 200 watts.

EQUIPMENT SUPPLIED: Totalizing recorder amplifier, totalizing counter panel, 10' interconnecting cable, 100% set tubes.

The M-3815 Totalizer is also available less the counter panel where other indicating devices are preferred to that of the direct reading counter.

ORDERING INFORMATION

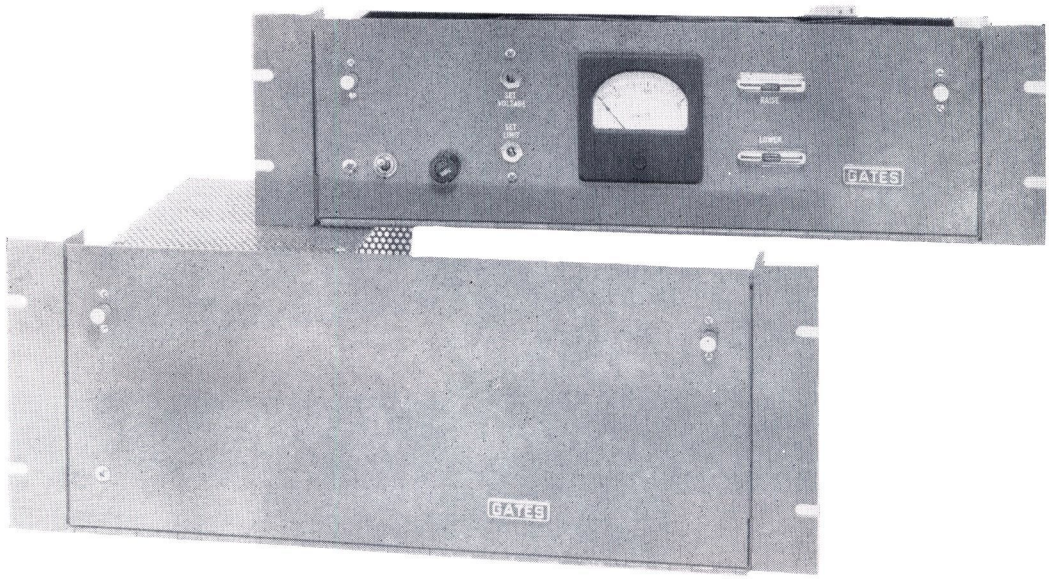
Totalizer complete with counter panel and tubes (as illustrated)	**M-3815**
Totalizer unit with tubes but less counter panel	**M-5507**
100% spare tube kit	**TK-230**



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GATES

ELECTRONIC VOLTAGE REGULATORS

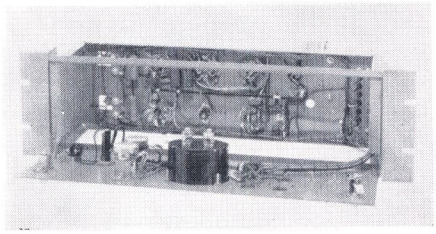


Available in ranges from 1 KVA to 70 KVA and in one or three phase systems. All models consist of two units: (1) the rack or cabinet type electronic control unit requiring only 5¼"x19" of panel space, and (2) the rack or cabinet model motor driven variable transformer in 1 KVA or 2 KVA sizes. As the electronic voltage regulator is a device to move forward or backward a motor driven variable transformer, there is no problem in wave form distortion such as often accompanies many types of regulators. The speed of voltage reset is fast enough for excellent operation with varying loads such as a Class B modulator. In addition, less than maximum loads will in no way upset either the regulation or wave form.



Front of rack mount M-5294 electronic regulator control panel.

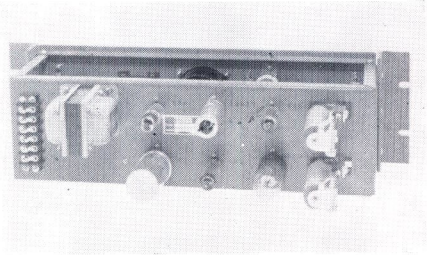
For all power ratings the M-5294 electronic control unit is identical, always consuming only 5½"x19" of rack space, or approximately 7"x21"x10" if cabinet type is for wall mounting. The electronic regulator may be adjacent or several hundred feet from the motor driven variable transformer. Six interconnecting wires are required between the two units—no larger than 16 AWG regardless of distance.



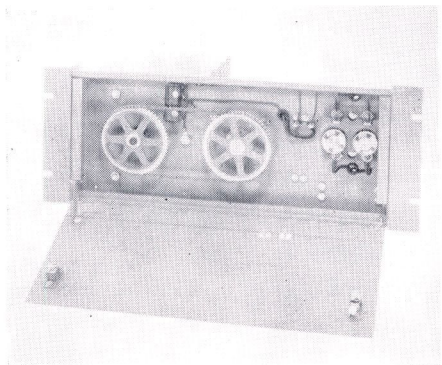
Front panel of M-5294 electronic regulator drops down so all components can be reached.

Models for 115 and 230 volts, as well as single and 3 phase are available. All models are rated for either 50 or 60 cycles.

Outstanding feature of all models is the absolute regulation regardless of load conditions. As the electronic regulator actually operates from the output of the regulated supply, it is continually seeking to find the correct voltage if the load is full or zero. Though adjustment may be made for regulation as close as ±1 volt, the regulator may be adjusted for looser tolerances if the applied load is not that critical. In this case the operation of the motor unit is less frequent, reducing wear.



Rear M-5294 electronic regulator. There are no external components other than the motor driven variable transformer unit.



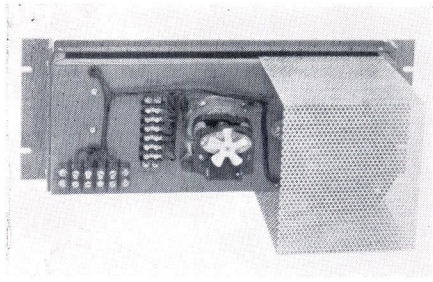
Front panel drop down view of the 1 KVA or 2 KVA models. These models will hold within ±1 volt at any load up to maximum where input voltages vary ±20%. Ideal for rack or smaller installations for TV, radio and hundreds of industrial applications.

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GATES

ELECTRONIC VOLTAGE REGULATORS

Principle of operation is by no means complex, yet extremely positive. The electronic control section operates from the output voltage present at the load point of the motor driven variable transformer. This, in turn, is adjusted by the electronic control unit M-5294 to be independent of the current consumed by the load. Control tube is a sharp cut-off pentode which has a large change in plate current in ratio to grid voltage. This tube, with other circuit components and tubes, operates sensitive relays of about 1 MA current. These relays handle the forward/reverse action of the motor driving the variable transformer. — The operator may adjust from the front panel of the M-5294 regulator, the exact output voltage desired. For example, a 230 volt model may be set for 208 volts output and maintain regulation at this point.



Rear of M-5295 rack mount motor driven variable transformer unit. M-5314, 2 KVA model is identical. Rack space is only 7"x19" or total for M-5294 electronic regulator and 1 or 2 KVA variable transformer unit is only 12¼"x19" of rack space.

The experienced engineer is well acquainted with the need for proper line voltages. For industrial applications the need is so great that even suggesting applications would consume pages. For radio and television broadcasting, the lack of uniform voltages at many critical points of both studio and transmitter operation may disrupt or greatly impair transmission.

SPECIFICATIONS

SIZE: M-5294 regulator; rack model, 5½"x19"x8½" deep.
M-5294A cabinet model regulator, 5½"x19"x10" deep.
M-5295 complete 1 KVA regulator, 12¼"x19"x8½" deep.
M-5295A complete 1 KVA cabinet model, 14"x21"x10" deep.
M-5314 complete 2 KVA regulator, 12¼"x19"x8½" deep.
M-5314A complete 2 KVA cabinet model, 14"x21"x10" deep.

REGULATION: ±17% variation of input voltage will allow constant output voltage as close as ±1%, regardless of load.

TUBES: 6X4, 12AT7, 6AU6.

FINISH: Medium gloss gray.

ORDERING INFORMATION

115 Volt, 50/60 Cycle Automatic Voltage Regulators, Single Phase

Rating	Style	Cat.
1 KVA	Rack Mounted	M-5295
1 KVA	With Wall Mounted Control Unit	M-5295A
2 KVA	Rack Mounted	M-5314
2 KVA	With Wall Mounted Control Unit	M-5314A
6 KVA	With Rack Mounted Control Unit	M-5315
6 KVA	With Wall Mounted Control Unit	M-5315A
15 KVA	With Rack Mounted Control Unit	M-5316
15 KVA	With Wall Mounted Control Unit	M-5316A

230 Volt, 50/60 Cycle Automatic Voltage Regulators, Single Phase

2.4 KVA	Rack Mounted	M-5317
2.4 KVA	With Wall Mounted Control Unit	M-5317A
7.5 KVA	With Rack Mounted Control Unit	M-5318
7.5 KVA	With Wall Mounted Control Unit	M-5318A
27.5 KVA	With Rack Mounted Control Unit	M-5319
27.5 KVA	With Wall Mounted Control Unit	M-5319A

230 Volt, 50/60 Cycle Automatic Voltage Regulators, Three Phase

10 KVA	With Rack Mounted Control Unit	M-5320
10 KVA	With Wall Mounted Control Unit	M5320A
20 KVA	With Rack Mounted Control Unit	M-5321
20 KVA	With Wall Mounted Control Unit	M-5321A
45 KVA	With Rack Mounted Control Unit	M-5322
45 KVA	With Wall Mounted Control Unit	M-5322A
70 KVA	With Rack Mounted Control Unit	M-5323
70 KVA	With Wall Mounted Control Unit	M-5323A

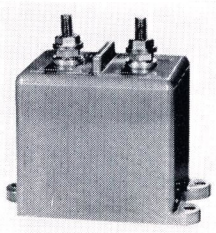
NOTE: For Voltages higher than 230 volts, prices on application.

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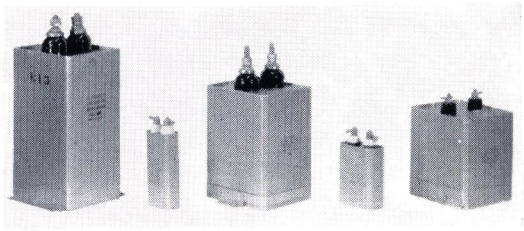
GATES

MICA AND FILTER CAPACITORS





TYPE F



Catalog Number	Capacity Mfd.	Peak Wkg. Volts
Type G1		
G1-641	.00001	6000
G1-645	.00005	6000
G1-631	.0001	6000
G1-632	.0002	6000
G1-634	.0004	6000
G1-635	.0005	6000
G1-621	.001	6000
G1-6215	.0015	6000
G1-622	.002	6000
G1-623	.003	6000
G1-624	.004	6000
G1-625	.005	6000
G1-526	.006	5000
G1-511	.01	5000
G1-4115	.015	4000
G1-312	.02	3000
Type G2		
G2-1031	.0001	10000
G2-10315	.00015	10000
G2-1032	.0002	10000
G2-10325	.00025	10000
G2-1035	.0005	10000
G2-1021	.001	10000
G2-10212	.0012	10000
G2-10215	.0015	10000
G2-1022	.002	10000
G2-823	.003	8000
G2-824	.004	8000
G2-525	.005	5000
G2-526	.006	5000
G2-511	.01	5000
G2-4115	.015	4000
G2-312	.02	3000
Type G3		
G3-2045	.00005	20000
G3-2031	.0001	20000
G3-2032	.0002	20000
G3-20325	.00025	20000
G3-2033	.0003	20000
G3-2035	.0005	20000
G3-2038	.0008	20000
G3-2021	.001	20000
G3-15215	.0015	15000
G3-1522	.002	15000
G3-1523	.003	15000
G3-1524	.004	15000
G3-1025	.005	10000
G3-1026	.006	10000
G3-1028	.008	10000
G3-1011	.01	10000
G3-512	.02	5000
G3-313	.03	3000

Catalog Number	Capacity Mfd.	Peak Wkg. Volts
Type G4		
G4-3043	.00003	30000
G4-3045	.00005	30000
G4-3031	.0001	30000
G4-30315	.00015	30000
G4-30325	.00025	30000
G4-3035	.0005	30000
G4-3038	.0008	30000
G4-3021	.001	30000
G4-25215	.0015	25000
G4-2022	.002	20000
G4-2023	.003	20000
G4-2024	.004	20000
G4-1525	.005	15000
G4-1526	.006	15000
G4-1228	.008	12000
G4-1011	.01	10000
G4-612	.02	6000
G4-514	.04	5000
Type G5		
G5-5045	.00005	50000
G5-3531	.0001	35000
G5-35325	.00025	35000
G5-3534	.0004	35000
G5-3535	.0005	35000
G5-3521	.001	35000
G5-3022	.002	30000
G5-30225	.0025	30000
G5-3023	.003	30000
G5-2525	.005	25000
G5-2026	.006	20000
G5-1511	.01	15000
Type F1 Mica Capacitors		
F1-341	.00001	3000
F1-345	.00005	3000
F1-331	.0001	3000
F1-3315	.00015	3000
F1-332	.0002	3000
F1-3325	.00025	3000
F1-333	.0003	3000
F1-334	.0004	3000
F1-335	.0005	3000
F1-336	.0006	3000
F1-3375	.00075	3000
F1-338	.0008	3000
F1-321	.001	3000
F1-3215	.0015	3000
F1-322	.002	3000
F1-3225	.0025	3000
F1-223	.003	3000
F1-224	.004	2000
F1-225	.005	2000
F1-226	.006	2000
F1-1528	.008	1500
F1-111	.01	1000
F1-112	.02	1000
F1-0215	.05	250
F1-0201	.1	250

Type F2 Mica Capacitors

F2-545	**.00005**	**5000**
F2-531	**.0001**	**5000**
F2-5315	**.00015**	**5000**
F2-532	**.0002**	**5000**
F2-5325	**.00025**	**5000**
F2-533	**.0003**	**5000**
F2-534	**.0004**	**5000**
F2-535	**.0005**	**5000**
F2-536	**.0006**	**5000**
F2-5375	**.00075**	**5000**
F2-538	**.0008**	**5000**
F2-521	**.001**	**5000**
F2-5215	**.0015**	**5000**
F2-522	**.002**	**5000**
F2-5225	**.0025**	**5000**
F2-523	**.003**	**5000**
F2-424	.004	4000
F2-325	.005	3000
F2-326	.006	3000
F2-328	.008	3000
F2-211	.01	2000
F2-2115	.015	2000
F2-212	.02	2000
F2-213	.03	2000
F2-1514	.04	1500
F2-1515	.05	1500
F2-0501	.1	500
F2-0202	.2	250
F2-02025	.25	250

Type F3 Mica Capacitors

F3-8325	.00025	8000
F3-835	.0005	8000
F3-821	.001	8000
F3-822	.002	8000
F3-825	.005	8000
F3-811	.01	8000
F3-415	.05	4000
F3-201	.1	2000
F3-06025	.25	600
F3-0605	.5	600
F3-0610	1.0	600

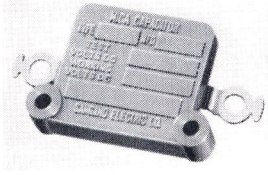
TYPE E

Catalog Number	Capacity Mfd.	Test Volts D. C.
E-1245	.00005	12500
E-1231	.0001	12500
E-12325	.00025	12500
E-1235	.0005	12500
E-1221	.001	12500
E-12215	.0015	12500
E-1222	.002	12500
E-1023	.003	10000
E-1024	.004	10000
E-1025	.005	10000
E-721	.001	7000
E-722	.002	7000
E-723	.003	7000
E-711	.01	7000
E-3524	.004	3500
E-3525	.005	3500
E-3511	.01	3500
E-3512	.02	3500
E-3515	.05	3500
E-215	.05	2000
E-201	.1	2000

Type	Capacity
7106-2	2— 600 volts DC
7106-4	4— 600 volts DC
7106-8	8— 600 volts DC
7106-10	10— 600 volts DC
7110-2	2—1000 volts DC
7110-4	4—1000 volts DC
7110-8	8—1000 volts DC
7110-10	10—1000 volts DC
7120-2	2—2000 volts DC
7120-4	4—2000 volts DC
7120-8	8—2000 volts DC
7120-10	10—2000 volts DC
7130-2	2—3000 volts DC
7130-4	4—3000 volts DC
7130-8	8—3000 volts DC
7140-2	2—4000 volts DC
7140-4	4—4000 volts DC
7140-6	6—4000 volts DC
7150-2	2—5000 volts DC
7150-4	4—5000 volts DC
7160-1	1—6000 volts DC
7160-2	2—6000 volts DC
7175-1	1—7000 volts DC
7175-2	2—7000 volts DC
TK70040	4—7000 volts DC



TYPE E



TYPE H
MICA CAPACITORS

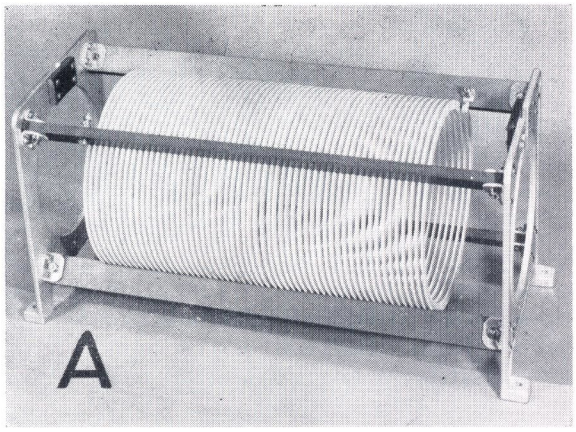
1200 W.V.D.C.

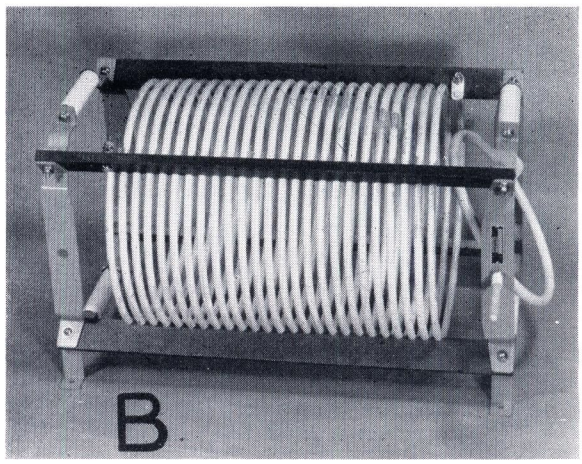
H-T2450	.00005	$0.96
H-T2310	.0001	.96
H-T2320	.0002	.96
H-T2325	.00025	.96
H-T2330	.0003	.96
H-T2340	.0004	.96
H-T2350	.0005	.96
H-T2210	.001	1.08
H-T2215	.0015	1.38
H-T2220	.002	1.44
H-T2225	.0025	1.68
H-T2230	.003	1.83
H-K2240	.004	1.83
H-K2250	.005	1.98
H-K2260	.006	1.98
H-K2280	.008	2.31
H-K2110	.01	3.06

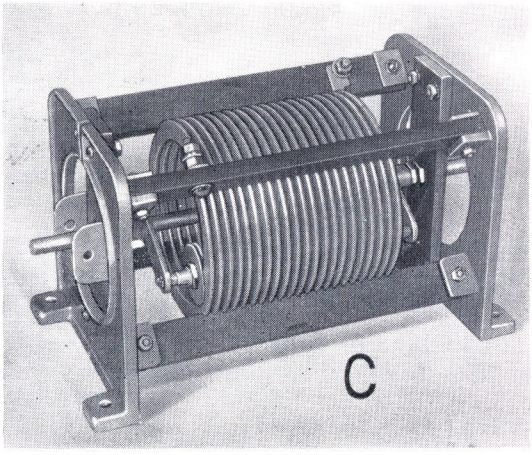
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GATES

INDUCTORS, VARIABLE AND FIXED





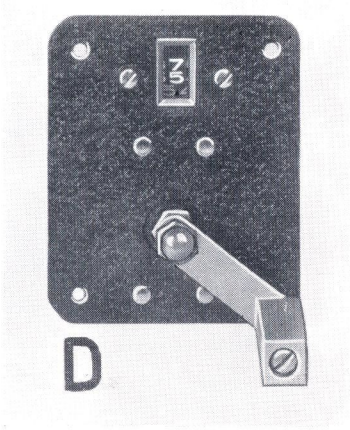


Used in both Gates and many other makes of transmitters and phasing equipment. Variable coils have cast aluminum end bells with double gripping bearing wheels. All types are micalex insulated and silver plated.

LEGEND:

FA—Fixed 1/4" edgewise, 10 amp. rating, Fig. A
FB—Fixed 3/8" edgewise, 15 amp. rating, Fig. A
FC—Fixed 1/2" edgewise, 20 amp. rating, Fig. A
FBT—Fixed 3/8" copper tubing, 30 amp. rating, Fig. B
FCT—Fixed 1/2" copper tubing, 40 amp. rating, Fig. B
VB—Variable 3/8" edgewise, 15 amp. rating, Fig. C
VC—Variable 1/2" edgewise, 20 amp. rating, Fig. C

Ind. uh	Length	Diam.	Cat. No.	Ind. uh	Length	Diam.	Cat. No.
87	12 1/16"	4"	87FA4634	17	8 3/4"	4"	17FC1654
6	5 15/16"	4"	6FB0854	24	8 3/4"	5"	24FC1655
10	5 15/16"	5"	10FB0855	32	8 3/4"	6"	32FC1656
13	5 15/16"	6"	13FB0856	42	12 5/8"	6"	42FC2266
18	8 3/4"	4"	18FB1754	67	13 1/16"	6"	67FC2856
26	8 3/4"	5"	26FB1755	78	16"	8"	78FC2568
35	8 3/4"	6"	35FB1756	10	12 1/2"	6"	10FBT1066
58	10 3/8"	5"	58FB2845	32	15"	8"	32FBT1658
78	10 3/8"	6"	78FB2846	45	18 1/2"	8"	45FBT2158
128	12 1/8"	5"	128FB4635	65	24 1/2"	9"	65FBT2559
6	6 1/4"	4"	6FC0854	17	14"	8"	17FCT1178
10	6 1/4"	5"	10FC0855	35	24 1/2"	9"	35FCT1779-C
13	6 1/4"	6"	13FC0856				



VARIABLE COILS

Ind. uh	Length	Diam.	Cat. No.	Ind. uh	Length	Diam.	Cat. No.
6	8"	4"	6VC0854	16	9 1/8"	4"	16VB1544
15	10 3/4"	4"	15VC1444	30	11 1/8"	4"	30VB2344
26	10 3/4"	4"	26VC2144	105	12 1/2"	5"	105VB3735

CLIPS

LC4	For 1/4" edgewise FA coils
LC6	For 3/8" edgewise FB coils
LC8	For 1/2" edgewise FC coils
RC6	For 3/8" tubing FBT coils
RC8	For 1/2" tubing FCT coils

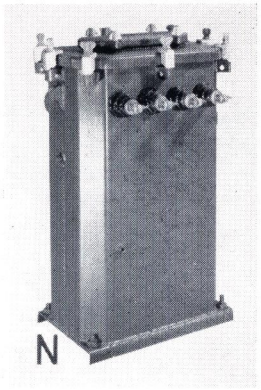
DIAL FOR VARIABLE COIL

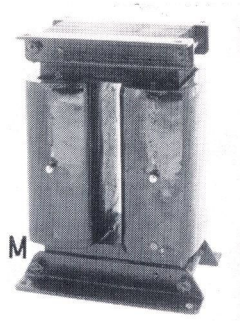
M3401F Veeder counter geared type, reads to 1/10 turn. 1/4" diam. shaft. Fig. D.

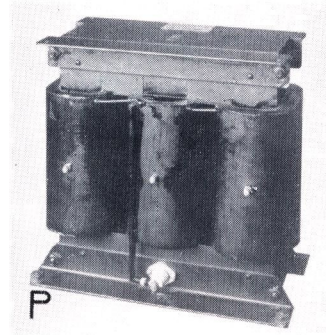
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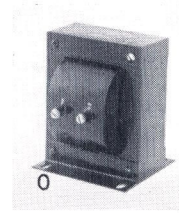
GATES

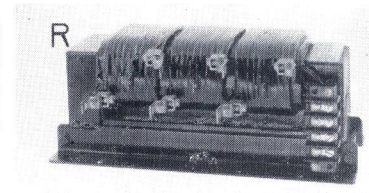
TRANSFORMERS FOR BROADCASTING











These quality transformers are for radio broadcasting, communications and in many instances, television transmitters are regularly carried in stock and are of such specialized design they will not be found elsewhere. If you are modernizing, building your own or need a replacement transformer, you need not wait for it to be specially built as the Gates stock is in most cases immediately available.

Transformers for 250 Watts

MODULATION TRANSFORMER: Primary for PP Class B, 810 tubes. Secondary 4000 ohms no current in Sec. Response 30-10,000 cycles ±1 db. Fully cased. 7¼" high, 6 1/8" wide, 5¼" deep. **BM-1**

MODULATION REACTOR: For use with modulation transformer BM-1 above. Inductance 65 hy. Current 250 MA ±1 db, 30-10,000 cycle response. Fully cased. Size matches BM-1. ..... BR-1

DRIVER TRANSFORMER: Primary PP 6L6, 1622, etc. Secondary Class B, 810 tube grids. Chassis mounting, fully cased. Response ±1 db, 30-10,000 cycles. **BD-1**

POWER TRANSFORMER: Primary 215/230/245 volts, 50/60 cycles. Secondary 1700-0-1700 volts at 0.85 amperes continuous duty 3% regulation under Class B modulation. Case Style M. **AP-7235**

SWINGING CHOKE: 5-25 hy. at 500 MA. 52 ohms resistance. 7000V insulation. Round case, base terminals. **CG-109**

SMOOTHING CHOKE: 25 hy. at 300 MA. 90 ohms resistance. 5000V insulation. Round case, base terminals. **CG-105**

Transformers for 500 Watts

MODULATION TRANSFORMER: Primary for PP Class B, 833A tubes. Secondary 6400 ohms no current in Sec. Response ±1 db, 30-10,000 cycles. Case Style M. **AM-30613**

MODULATION REACTOR: For use with above modulation transformer. 50 hy. at 350 MA. 225 ohms resistance. Response ±1 db, 30-10,000 cycles. Case Style M. **AC-10650**

DRIVER TRANSFORMER: For PP 845 tubes or similar Class A to PP 833A Class B grids. ±1 db, 30-10,000 cycles. Chassis mount. **AS-3172C**

POWER TRANSFORMER: Primary 230 volts, 50/60 cycles. Secondary 2335-0-2335 volts at 0.46 amperes continuous duty to deliver 2000 volts at 650 MA. Three choke input. Case Style M. **AP-12001E**

SWINGING CHOKE: 5-25 hy. at 500 MA. 52 ohms resistance. 7000V insulation. Round case, base terminals. **CG-109**

SMOOTHING CHOKE: 25 hy. at 300 MA. 90 ohms resistance. 5000V insulation. Round case, base terminals. **CG-105**

Transformers for 1000 Watts

MODULATION TRANSFORMER: Primary for PP 833A in Class B. Secondary 4750 ohms no current in Sec. Also has a second tapped secondary to provide 2, 4 or 8 watts at 3000 ohms for modulating the RF driver stage, if desired. ±1 db, 30-10,000 cycles. Case Style M. **AM-30469**

MODULATION REACTOR: For use with AM30469 modulation transformer. Inductance 40 hy. Resistance 170 ohms. Current 600 MA. Response ±1 db, 30-10,000 cycles. Case Style M. **AC-10465**

DRIVER TRANSFORMER: For PP 845 tubes or similar in Class A to PP 833A tubes Class B. ±1 db, 30-10,000 cycles. Chassis mount. **AS-3172C**

POWER TRANSFORMER: Primary 230 volts, 50/60 cycles. Secondary 3100-0-3100 volts at 0.71 amperes to produce 2600 volts DC at 1 ampere when used with choke input filter. Case Style M. **AP-10459E**

SWINGING CHOKE: High inductance, high current type, 5-16 hy. at 1.5 amperes. Resistance 30 ohms. 10,000V insulation. Case Style M. **AC-10458**

SMOOTHING CHOKE: 2½ hy. at 700 MA. 20 ohms resistance. 10,000V insulation. Case Style O. **AC-10457**

Transformers for 5000 Watts

MODULATION TRANSFORMER: Primary for PP Class B 3X2500A3 or 3X2500F3 tubes. Secondary 3600 ohms. ±1 db, 30-10,000 cycles. Dry type. Case Style M. **AM-7718E**

MODULATION TRANSFORMER: Same specifications as AM-7718E above, only oil filled indoor or outdoor type in steel tank. Case Style N. **AM-7718M**

MODULATION REACTOR: 30 hy. at 1.4 amperes. Response ±1 db, 30-10,000 cycles. Insulation 15,000V. Dry type. Case Style M. Companion to modulation transformer AM-7718E. **AC-7719E**

MODULATION REACTOR: Oil filled type in steel tank for indoor or outdoor mounting. 52 hy. at 1.4 amperes. Case Style N. Companion to modulation transformer AM-7718M. **AC-7719M**

POWER TRANSFORMER: Primary 205/215/230 volts, 50/60 cycles, 3 phase delta. Secondary 2160 volts per leg Y connected. Supplies 5000 volts DC at 2.3 amperes when used with six 8008 or 872A rectifier tubes. Dry type. Case Style M. Companion to AM-7718E and AC-7719E. **AP-8000E**

POWER TRANSFORMER: Primary 230 volts, 50/60 cycles, 3 phase delta. Secondary 2160 volts per leg Y connected to deliver 5000 volts DC at 2.3 amperes when used with six 8008 or 872A rectifiers. Oil filled type in steel tank for indoor or outdoor mounting. Case Style N. Companion to AM-7718M and AC-7719M. **AP-8000M**

INPUT OR SMOOTHING CHOKE: 4 hy. at 1.5 amperes. 17 ohms resistance. 8000V insulation RMS. Case Style M. **AC-3143E**

DRIVER TRANSFORMER: For PP parallel 845 tubes or similar Class A to PP 3X2500A3 or 3X2500F3 grids Class B. ±1 db, 30-10,000 cycles. Chassis mount. Balance windings for individual biasing of 3X2500 grids. **AS-3172C**

Transformers for 10,000 Watts

MODULATION TRANSFORMER: Primary for PP 3X2500A3 or 3X2500F3 tubes Class B. Secondary 1780 ohms. ±1 db, 30-10,000 cycles. Dry type. Case Style M. **AM-30643E**

MODULATION TRANSFORMER: Same specifications as AM-30643E, only oil filled in steel tank for indoor or outdoor mounting. Case Style N. **AM-3167M**

MODULATION REACTOR: 26 hy. at 2.8 amperes ±1 db, 30-10,000 cycles. Dry type. Case Style M. Companion to AM-30643E. **AC-3168E**

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TRANSFORMERS (continued)

MODULATION REACTOR: Same as AC-3168E, only oil filled in steel tank for indoor or outdoor service. Case Style N. Companion to modulation transformer AM-3167M. **AC-3168M**

DRIVER TRANSFORMER: For PP parallel 845 tubes or similar Class A to PP 3X2500A3 or 3X2500F3 grids Class B. ±1 db, 30-10,000 cycles. Chassis mount. Balanced windings for individual bias of 3X2500 tubes. **AS-3172C**

POWER TRANSFORMER: Primary 230 volts, 50/60 cycles, 3 phase delta. Secondary tapped to deliver 5000, 5250 or 5500 volts DC at 4.5 amperes when used with six 673 tubes Y connected. Dry type. Case Style P. Companion to AM-3167E and AC-3168E. **AP-3090E**

POWER TRANSFORMER: Same as above, only oil filled in steel tank for indoor and outdoor mounting. Case Style N. Companion for AM-3167M and AC-3168M. **AP-3090M**

INPUT OR SMOOTHING CHOKE: 2 hy. at 3 amperes. 6.4 ohms resistance. 18,000 volt insulation. Case Style M. In 10KW broadcast, 2 chokes are used as input chokes for RF and modulators **AC-3147E**

Transformers for 20KW

MODULATION TRANSFORMER: Primary for four 3X3000A1 or 3X3000F1 tubes in PP parallel, impedance 5000 ohms plate to plate. Secondary 935 ohms to match Class C amplifier of four 3X2500A3 or 3X2500F3 tubes. ±1 db, 30-10,000 cycles. Oil filled indoor or outdoor type. Case Style N. Use with modulation reactor AC-8675M and driver transformer AS-8672E listed below. **AM-8674M**

MODULATION REACTOR: 14 hy. at 5.25 omperes. ±1 db, 30-10,000 cycles. Oil filled indoor or outdoor type. Case Style N. Use with AM-8674M modulation transformer and 8 mfd. coupling capacitor. **AC-8675M**

DRIVER TRANSFORMER: Primary two 845 tubes or similar in Class A. Secondary two windings for Class B grids of four 3X3000A1 or 3X3000F1 tubes in PP parallel. ±1 db, 30-10,000 cycles. Chassis mount. **AS-8672E**

POWER TRANSFORMER: Suggest separate power supplies for modulators and RF, using two Type AP-3090M power transformers as listed above under 10KW transformers.

FILTER REACTOR: 2 hy. at 5.3 amperes. Oil filled indoor or outdoor mounting. For 20KW two used for dual power supplies as suggested above under "Power Transformer." Case Style N. **AC-8673M**

Transformers for 50KW

MODULATION TRANSFORMER: Primary 3300 ohms plate to plate for two 5891 tubes, Class B, with 10.7 KV on plates. Secondary 1700 ohms. Oil filled in steel tank for indoor or outdoor service. ±2 db, 30-10,000 cycles. Case Style A. Size: 33" wide, 42" deep, 58" high. **AM-11788**

MODULATION REACTOR: For use with AM-11788 above. 25 hy. at 6.5 amperes. 7600 volts RAS at 30 cycles. ±2 db, 30-10,000 cycles. Oil filled in steel case for indoor or outdoor mounting. Size: 40" diameter, 56" high. Case Style O. **AC-11787**

DRIVER TRANSFORMER: A cathode follower circuit is recommended for this service employing four type 833A driver tubes. Circuit information will be supplied to purchasers of AM-11788 and AC-11787 units where requested.

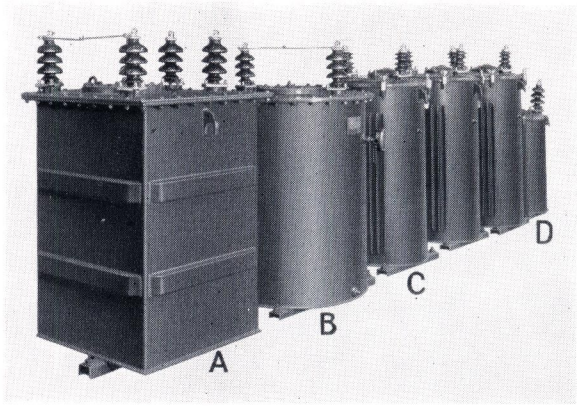
POWER TRANSFORMER: Primary 460 volts single phase, 50/60 cycles. 3 required for 3 phase delta primary and secondary. Primary has 2½% taps above and below 460V and 50% tap for low power. Secondary 8300-4150 volts. When used with 3 phase full wave bridge rectifier, filter reactor AC-11786 below and six type 857B rectifier tubes will deliver 10,700 volts DC at 13 amperes. Case Style C. Oil filled indoor or outdoor mounting. Size: 27" diameter, 56" high. **AP-11785M**

FILTER REACTOR: 1 hy. at 13 amperes, 34,000 volt test insulation. Oil filled in steel tank for indoor or outdoor mounting. Case Style D. **AC-11786**

Filament Transformers

For single 3X2500A3 or 3X2500F3. Primary 215/230/245 volts, 50/60 cycles. Secondary 7.8 VCT 51 ampere secondaries. Case Style R. **AF-7782E**

For three 3X2500A3 or 3X2500F3. Primary 215/230/245 volts, 50/60 cycles. Three separate 7.8 VCT 51 ampere secondaries. Case Style R. **AF-10434E**



For 5891 tube in 50KW service. Three required for 3 phase. Primary 230 volts, single phase, 50/60 cycles with ±2½% taps. Secondary 11 volts at 95 amperes. Primaries are delta connected and secondaries Y connected. Size: 6¼" wide, 9 5/8" high, 7 5/8" deep. **AF-11856E**

For four 833A, 810 or similar tubes. Primary 230 volts, 50/60 cycles. Secondary No. 1, 10 VCT at 10 amperes. Secondary No. 2, 10 VCT at 10 amperes. Secondary No. 3, 10 VCT at 20 amperes. Has heavy wire leads for direct connection to tube sockets. Case Style R. **AF-30099E**

Rectifier filament transformer. Has 6 secondary windings 5 VCT at 10 amperes for 8008, 872A or 673 rectifier tubes. Primary 215/230/245 volts single phase, 50/60 cycles. Used as rectifier filament transformer in 5, 10 and 20KW transmitters. Insulation 15,000 volts. Case Style R. **AF-10432E**

Rectifier filament transformer. Primary 230 volts, 50/60 cycles. Secondary 5.1 VCT at 15 amperes for two 8008 or 872A rectifier tubes. Insulation 10,000 volts **AF-10456K**

Rectifier filament transformer. For 857B rectifier filament as used in 50KW service. Primary 230 volts, 50/60 cycles with ±2½% taps. Secondary 5 volts at 33 amperes. Insulation all points 25,00 volts. Size: 6" wide, 3 7/8" deep, 8" high. **AF-11857E**

Audio Transformers

INPUT TRANSFORMERS: For transmitter input to low level audio stages. Handles +20 db input or less at low distortion. Quadruple shielding. Round case chassis mount. ±1 db, 30-15,000 cycles. Primary 125/250 or 500/600 ohms. Secondary for PP or single grid 120,000 ohms. **AI-3002U**

INPUT TRANSFORMER: Specifically designed for high quality preamplifier input. Triple shielding. Round case. Primary 50/150/250 ohms. Secondary to single 60,000 ohm grid. 1¾" diameter and 1 5/16" high. Maximum input level 0 db, ±½ db, 30-15,000 cycles. **AI-10379T**

INPUT TRANSFORMER: Identical to AI-10379T above, only primary 600 ohms. **AI-10386T**

OUTPUT TRANSFORMER: Preamplifier output transformer to match AI-10379T or AI-10386T input transformers. Primary 15,000 ohms, no DC in winding. Secondary 150/250 and 600 ohms. Excellent shielding. Size: 1" diameter and 1 3/16" high. ±½ db, 30-15,000 cycles. **AO-10427T**

OUTPUT TRANSFORMER: For program or remote amplifiers. Primary 10,000 ohms with up to 15 MA in winding. Secondary 150/250 and 600 ohms. Excellent shielding. Size: 2" wide, 1¾" deep, 2¾" high. ±1 db, 30-15,000 cycles. **AO-10864T**

REPEATER TRANSFORMER: Line to line. Primary and secondary 50/125/250/500 and 600 ohms. Maximum level +16 db. Response 20-20,000 cycles ±1 db shielding. Fully cased top or chassis mounting. **114A**

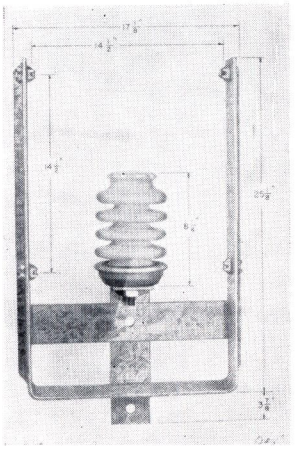
50,000 TRANSFORMERS

Listed on these pages is only a fraction of the huge transformer stock in the Gates stock rooms. If you have a breakdown, call the Gates service department first. If you need a special, it is likely Gates will have it. From the smallest ounce weight unit to 50 KW, be it audio, filter, power, equalizer, autoformer or filament transformers, the 50,000 transformer stock is the largest in the world geared to broadcaster and communications needs.

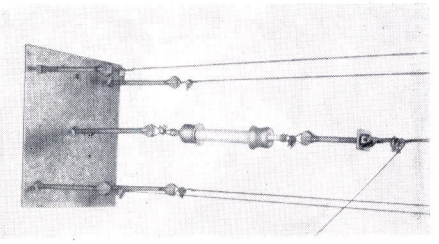
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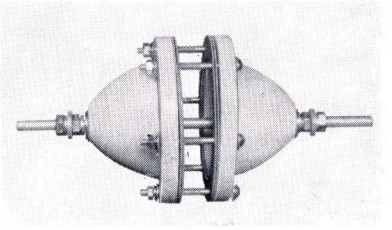
OPEN WIRE TRANSMISSION LINE



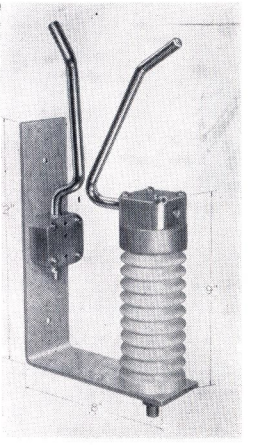
M-3327 Bracket



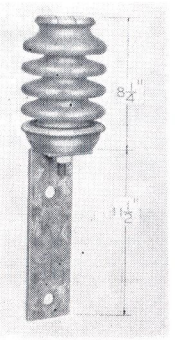
M-3328 End Plate



M-2870D Feed-Thru Bowl



M-3322 Horn Gap



M-3864 Center Post

Transmission Line Bracket

For 5 or 6 wire transmission line. Rating up to 150KW modulated. Made of ¼" steel 3" wide with welded L section on each side to fully prevent twisting under ice or wind load. Supplied with 8¼" ribbed insulator, wire guides and all hardware. Galvanized throughout.

Line Bracket M-3327

Line End Plate

To terminate the open wire line at each end. Plate is ¼" thick, 20" square. Fully galvanized. Includes turnbuckles, 25½" strain insulator and all hardware. Rating up to 150KW modulated.

End Plate M-3328

Feed-Thru Bowls

A large feed-thru bowl with 50KW modulated rating. Available in single and double units and with solid or hollow studs as listed below. Bowls are Alsimag. Hardware heavy brass. Velutex seals are provided for weather-tight installation.

Solid stud, 2 bowls, for walls to 10½" thick M-2870D
Same as above but hollow stud M-3254
Solid stud, single bowl, for walls 1" thick M-5280
Same as above but hollow stud M-5281

Horn Gap

A very desirable item where higher power is employed. Connects to hot side of line and ground to drain off lightning and heavy static discharges. Usually one is employed for each 200' of line. Insulator for 150KW arc gaps heavy chrome plate. Galvanized throughout.

Horn Gap M-3322

Center Post Assembly

Has variety of uses such as end or corner angling of transmission line, support insulator for two wire line or rhombic antennas, and a guide insulator such as end of building or coupling unit. Rating 150KW galvanized throughout.

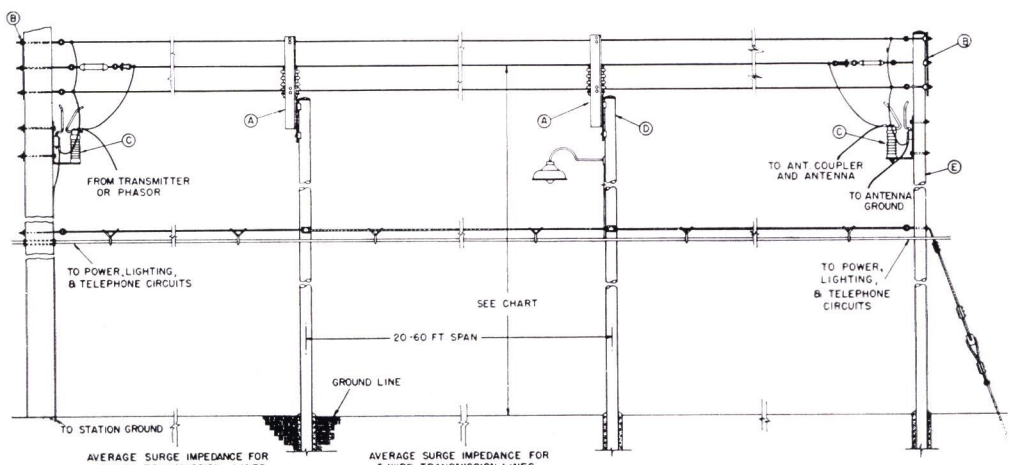
Center Post Insulator M-3864

Hard Drawn Wire

If desired, when ordering transmission line components, Gates will gladly supply No. 6, 8 or 10 hard drawn copper wire of current market prices. State length in feet desired, remembering to multiply the length of line by the number of wires in line, either 5 or 6.

Special Open Wire Lines

Gates engineers have designed many special open wire lines for both short and long distances. Most celebrated was a 30-mile line supplied for use in the Arctic Circle. Upon receipt of a sketch or word description of the requirements, Gates engineers will gladly submit layout and quotation.



AVERAGE SURGE IMPEDANCE FOR 6 WIRE TRANSMISSION LINES

HEIGHT OF CENTER WIRE	WIRE SIZE 6	8	10
9'	232Ω	246Ω	250Ω
10'	234Ω	250Ω	256Ω
12'	240Ω	252Ω	260Ω

AVERAGE SURGE IMPEDANCE FOR 5 WIRE TRANSMISSION LINES

HEIGHT OF CENTER WIRE	WIRE SIZE 6	8	10
9'	330Ω	346Ω	364Ω
10'	333Ω	350Ω	365Ω
12'	332Ω	348Ω	363Ω

Open Wire Design and Impedance Chart

Chart to the left illustrates typical five or six wire open type transmission line. Table is provided to show impedances with various wire sizes at certain heights above ground. Transmission line brackets are M-3327, end plate M-3328. Horn gap is M-3322. The power, lighting and telephone circuits shown are optional, according to requirements of installation. Open wire line will average about the same per foot cost as 7/8" coaxial cable.

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COAXIAL CABLE, TOWER LIGHTS AND ACCESSORIES

Solid Dielectric Cable

Low loss, flexible, polyethylene inner jacket covered by copper shield with vinyl outer jacket overall, impervious to exposure, acids, alkalis, oils and gasoline. Excellent AM transmission line.

Item	Cat. No.
Single conductor OD .285, impedance 51 ohms	**RG-8U**
Single conductor OD .285, impedance 75 ohms	**RG-11U**
Single conductor OD .680, impedance 51 ohms	**RG-17U**
Single conductor OD .910, impedance 51 ohms	**RG-19U**
Two conductor OD .285, impedance 95 ohms	**RG-22U**

RG cable should be ordered to length desired. Where continuous unbroken lengths are required in long sections, a refundable reel charge of $50.00 per reel will be made and fully credited with reel returned transportation prepaid.

Heliax 50 Ohm Coaxial Cable

A new type of cable combining high efficiency, ease of handling and low standing wave ratio. High efficiency due to spiral insulation of low loss polyethylene permitting high percentage of air in space between inner and outer conductors. The inside of the outer conductor is clad with heavy conductivity copper. Fully weatherproof and flexible, requiring no elbows, junction boxes etc., for making bends.

Coaxial cable 7/8" diam. Length to order. Specify end fittings desired as listed below and attached at no extra charge **H-0**
Coaxial cable 1 5/8" diam. Length to order. Specify end fittings desired as listed below and attached at no extra charge **H-1**
End terminal for 7/8" Heliax line **20-T**
Flange end terminal for 1 5/8" Heliax line **21-F**

Air Dielectric Coaxial Cable

Andrew air dielectric coaxial cable has solid copper outer conductor with inner conductor supported by steatite beads.

Coaxial cable 3/8" semi-flexible, impedance 70 ohms **83**
End terminal for 3/8" line with gas inlet and pressure gauge **1701-GV**
End terminal for 3/8" line with removable exhaust plug **1701-P**
End terminal for 3/8" line with needle valve for gas release **1701-R**
Coaxial cable 7/8" semi-flexible, impedance 50 ohms, power rating for AM broadcast 3.2KW **S-450**
End terminal for S-450 cable with gauge and valve **1703-AGV**
End terminal for S-450 cable with gas release plug **1703-AP**
End terminal for S-450 cable with release valve **1703-AR**

When ordering S-450 cable, specify end fittings desired as above and these will be attached at the factory and complete assembly shipped under pressure. No charge will be made for this service other than in large lengths, reel will be billed but refunded when returned transportation prepaid.

AIR DIELECTRIC COAXIAL CABLE (continued)

Item	Cat. No.
Coaxial cable 1 5/8" OD, impedance 51.5 ohms, rated 10 KW for AM broadcast, supplied in 20' lengths, includes flanges and fittings for each end	**451**
Coaxial cable, any special length of 451 (state length when ordering)	**12211**
Right angle mitered elbow for 451 cable, includes flanges and fittings	**1051-M**
45-degree mitered elbow with flanges and fittings for 451 cable	**1151-M**
Gas inlet coupling for 451 cable	**1351**
Clamp connector for providing a pressure type flange on cut end of 451 cable	**T-1551**
End terminal having Type N jack on one end, standard flange for Type 451 cable on other end, incorporates gas barrier and removable gas vent plug	**13942**

Ground Materials

No. 10 soft drawn copper ground wire, packed in 100-pound coils, approximately 3100 feet in 100 pounds **GR-10**
Copper ground strap 2" wide, packed in 100' rolls **GR-2ST**
Copper ground strap 4" wide, packed in 50' rolls **GR-4ST**
Ground rod, Copperweld heavy ground rod 8' long **GR-8R**
Ground screen, heavy copper, 3/4" mesh in sheets 8'x24' **GR-24SC**

The above materials are carried in Quincy and all branches. Prices shown in price list vary as to variance of copper market.

Pumps, Dehydrators

Dry air pump comes complete with 8' hose and silica gel fill **878**
Automatic dehydrator used with all sizes air dielectric lines for dehydrating as much as 40,000 feet of 7/8" line, 10,000 feet of 1 5/8" line, etc., wall mount **1910**
Gas distribution manifold, includes pressure gauges, needle valves, 15' of 1/4" copper tubing for any number of coaxial cables. State number of outlets desired **6600**

Tower Lights

Single obstruction light, bottom entrance conduit fitting furnished with lamp receptacle to accommodate either a 100 or 111 watt, 115V medium screw base lamp, or lumen medium pre-focus series lamp **OB-20**
Single obstruction light, same as Model OB-20 above but side entrance conduit fitting **OB-21**
Double obstruction light, provided with two lamp receptacles, each accommodating either 100 or 111 watts, medium screw base lamp, or lumen medium pre-focus lamp. Bottom entrance fitting type for 1" conduit.
For medium screw base **OB-22-4**
For pre-focus base **OB-22P-4**

(continued next page)

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COAXIAL CABLE, TOWER LIGHTS AND ACCESSORIES

TOWER LIGHTS (continued)

Code beacon 300 MM, standard fully approved FCC and CAA model supplied with two red filters.
For ¾" conduit **KG-114-3**
For 1" conduit **KG-114-1**
Replacement lamp, 100 watt obstruction **100A21-TS**
Replacement lamp, 111 watt obstruction **111A21-TS**
Beacon lamp, 500 watt **500PS-40**
Beacon lamp, 620 watt **620PS-40**

Complete Tower Light Kits

The following kits are complete, meeting the requirements of FCC Form 715, FCC Rules Part 17, and CAA standards for marking and lighting obstructions to air navigation, November 1, 1953. The FCC construction permit in all cases will specify the required lighting for each installation, which should tie to the specifications of lighting kits as shown below.

Tower lighting kit for towers to 150'.
FCC Spec. No. 2, CAA Spec. No. 1, includes one double obstruction light **A-1**

Tower lighting kit for towers 151' to 300'.
FCC Spec. Nos. 3, 11, 21 and CAA Spec. A-2, includes one code beacon, two obstruction lights, beacon flasher and photo-electric control **A-2**

Tower lighting kit for towers 301' to 450'.
FCC Spec. Nos. 3, 12, 21 and CAA Spec. A-3, includes code beacon, four obstruction lights, beacon flasher and photo-electric control **A-3**

Tower lighting kit for towers 451' to 600'.
FCC Spec. Nos. 3, 4, 13, 21 and CAA Spec. A-4, includes two code beacons, six obstruction lights, beacon flasher and photo-electric control **A-4**

For towers higher than 600' please write for prices. Equipment for tower lighting normally carried in stock at all times.

Flashers and Photo Cell Units

Single unit, indoor housing, lighting control unit with outdoor remote weather photo tube, includes complete code flasher for flashing of three towers and photo-electric cell control for automatic turning on and off 115/230 V, 50/60 cycle, 3 conductors to each tower **LC-2077**

Single unit, indoor housing, same as LC-2077 above but for 4 towers instead of 3 ..... **LC-2076**

Beacon flasher, electro-mechanical device for outdoor mounting, meets FCC and CAA regulations, single pole mercury tilt switch and synchronous motor, Model BF-32 has fail-safe provision for 117 V, single circuit type.
Beacon flasher **BF-31**
Beacon flasher with fail- safe **BF-32**

Gates is a national distributor for Andrew, Hughey & Phillips, Fischer-Pierce and other leading manufacturers of approved tower lighting equipment. Generous stocks are carried at the factory and all branches.

For open wire transmission line, see Page 218.

FLASHERS AND PHOTO CELL UNITS (continued)

Photo-cell and beacon flasher, a combination unit in weatherproof housing. Photo-cell may be rotated to north regardless of mounting position on tower. Turns on at 35-foot candles and off at 58-foot candles. Fully approved.
For 1 pole 30 amperes, flashes one circuit **LC-2074**
For 1 pole 30 amperes, flashes two circuits **LC-2072**

Fischer-Pierce Photo-Cell Unit, unit completely weatherproof, fully approved for turning on and off tower lights, has time delay of 5-7 seconds to prevent operating lights by chance exposure such as walking in front of unit.
Photo-cell unit for 105-130 volts, 3000 watt rating, SPST, double break **63305C**
Photo-cell unit, same as above but for 210-250 volts **63306C**

Rhombic Antenna Equipment

Rhombic transmitting antenna, frequency range 4-22 Mcs., power 30 KW. A 3-wire curtain. Kit consists of 3-strand No. 12 Copperweld wire with maximum side lengths of 375'. Strain and spreader insulators with necessary hardware included for tower or pole attachment. Downlead is supplied with transmission line kit (see RTL-300 below). Shipping weight: 500 lbs.
Rhombic transmission antenna **RTA-330**

Transmission line for rhombic antenna, a 500' 2-wire open-wire line having a nominal impedance of 600 ohms, with 3-strand No. 12 Copperweld wire spaced 12" apart, includes downlead for rhombic transmitting antenna (RTA-330 above), strain insulators, line support insulators for single pole mounting, horn gap insulators, with grounding wire and rods, improved entrance bowls, wooden crossarms (2) for dead ending, guys and anchors for one dead end and three line-turn poles, all with necessary hardware. Shipping weight: 400 lbs.
Transmission line for rhombic antenna **RTL-300**

Dissipation line for rhombic transmitting antenna, includes 1500' of No. 14 stainless steel wire, strain spreader and spacer insulators, line tension and equalization sheaves, ground wire and rod, one cross-arm with pole guy and anchor for dead ending below antenna, and all necessary hardware. Shipping weight: 125 lbs.
Dissipation line **TDL-340**

Doublet transmitting antenna, frequency range 2-15 Mcs., power 30 KW, consists of 7-strand No. 12 Copperweld wire, includes strain insulators and hardware for Attaching to towers or poles. Downlead included in kit listed below. Shipping weight: 90 lbs.
Doublet antenna **DTA-430**

Transmission line for doublet transmitting antenna, 500' long, 2- wire, 600 ohm, open-wire line consists of 3-strand No. 12 Copper weld for downlead (delta match type) and line, dead end cross-arms, strain line support and improved entrance bowl insulators, horn gap insulators with grounding wire and rod, pole guys and anchors for dead end poles and line-turn poles, and necessary hardware. Shipping weight: 360 lbs.
Transmission line for doublet antenna **DTL-400**

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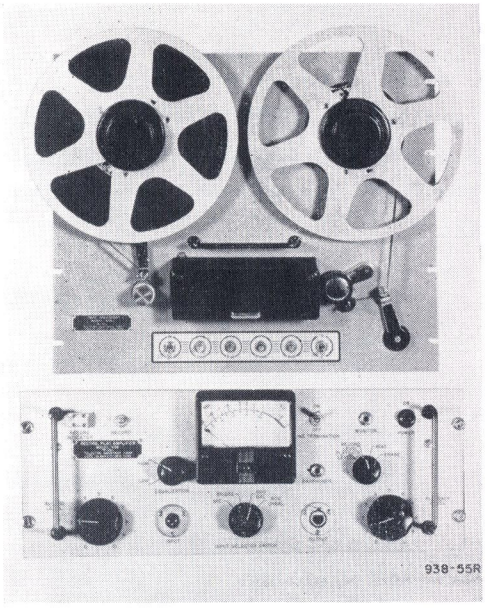
TELECTRO PROFESSIONAL TAPE RECORDERS

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

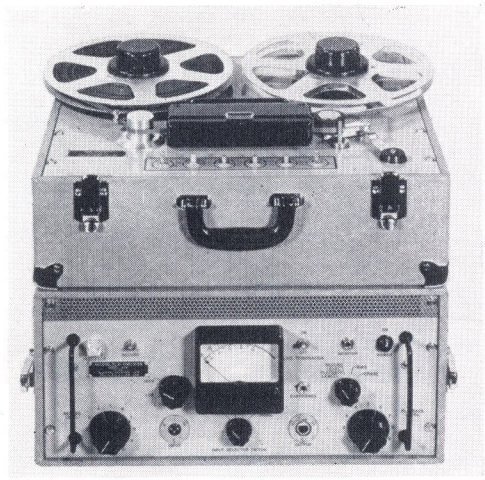
Tape transport mechanism is a masterpiece of precision. Partial features include: (1) hysteresis synchronous motor, (2) dual torque motors for supply and take up reels, (3) adjustable take up torque, (4) self-aligning solenoid operated brakes, (5) heavy fly-wheel for low flutter, (6) automatic shut off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



Model 938C



Model 938R



Model 938P

MECHANICAL AND ELECTRICAL SPECIFICATIONS

STARTING TIME: Less than 0.1 second.

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

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

PLAYBACK TIME ACCURACY: Better than 0.2%.

REWIND TIME: Less than 1 minute.

FAST WIND TIME: Less than 1 minute.

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

MOUNTING AND INSTALLATION: Horizontal or vertical. Designed for either rack or console installation. Also available in handsomely designed carrying case.

WOW AND FLUTTER: Less than 0.15% rms at 15 ips. Less than 0.2% rms at 7½ ips.

POWER SOURCE: 115 volts, 60 cps.

POWER CONSUMPTION: 230 watts.

FREQUENCY RESPONSE: at 15 ips ..... 30 to 15,000 ±2 db.
at 7½ ips ..... 30 to 15,000 ±4 db.
at 7½ ips ..... 30 to 10,000 ±2 db.

SIGNAL TO NOISE RATIO: Over 55 db at both 7½ and 15 ips as defined by NARTB standards.

DISTORTION: Less than 2% rms at maximum recording level.
Less than 1% rms at standard recording level.

OUTPUT TERMINATION: 600 ohms balanced—termination switch is provided; monitor jack for connection to a power amplifier; jack for 600 ohms headset.

OUTPUT VOLTAGES: 0 VU or +4 dbm across 600 ohms balanced load or unbalanced load. 6 volts across 20,000 ohms.

INPUTS: Microphone input—30 to 250 ohms.
Bridge input—20,000 ohms.
Line input—600 ohms balanced. 600 ohms unbalanced.

MONITORING SWITCH: Rapid switching from monitoring tape playback to monitoring live input.

METER SWITCH: Provides rapid switching for indicating:
Playback level; Record level; Bias level; Erase Current.

METER: VU.

CONTROLS: Input jack, output jacks and meter—located on front panel.

ERASE OSCILLATOR: 85 kc adjustable. Screwdriver adjustment permits rapid setting of erase current level.

BIAS LEVEL: Screwdriver adjustment permits easy setting of bias level.

SIZES: (Console) 34"x23"x25½"deep.
(Rack) transport 19"x15¾"x5" deep.
Amplifier 19"x7"x14" deep.
(Portable) 2 cases 20"x20"x9" high.

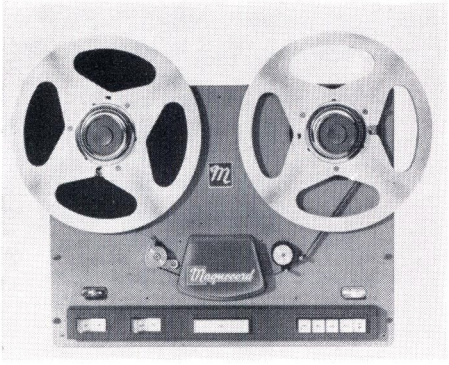
ORDERING INFORMATION

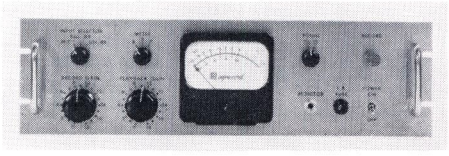
Console model, full track, as illustrated 938C
Rack model, full track, as illustrated 938R
Two-cast portable model, full track, as illustrated 938P

NOTE: All models available in half track at no extra cost, where stated on order. Stereophonic models also available.

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NEW MAGNECORD 727 SERIES





As new as Magnecord's big new manufacturing plants in Oklahoma, the 727 Series offers advanced professional results at a price lower than one would estimate for such quality. Two units consisting of rack mount transport mechanism and rack mount amplifier. Fully adaptable to remote control.

SPECIFICATIONS

Tape Transport

TAPE SPEEDS: 7½" and 15".
REEL SIZE: 10½" or 7" or 5".
TAPE DRIVE: Direct synchronous hysteresis capstan drive. Electrically adjusted torque motors.
TAPE LOADING: Deep slot with automatic tape lifter during rewind and fast forward.
STARTING TIME: Instantaneous to normal forward.
OPERATIONAL CONTROLS: Push-button type, rewind, stop, record, play, fast forward, cue, off/on and capstan speed change.
TIMING ACCURACY: 3 seconds in 30 minutes.
WOW, FLUTTER: 0.15% at 15" and 0.2% at 7½".
RESPONSE: 30-15,000 cycles ±2 db at 15".
40-12,000 cycles ±2 db at 7½".
HEADS: Full track.
NOISE: 55 db down from third harmonic distortion point.
HIGH FORWARD AND REWIND TIME: 100 seconds full 10½" reel.
PANEL SIZE: 19"x14".

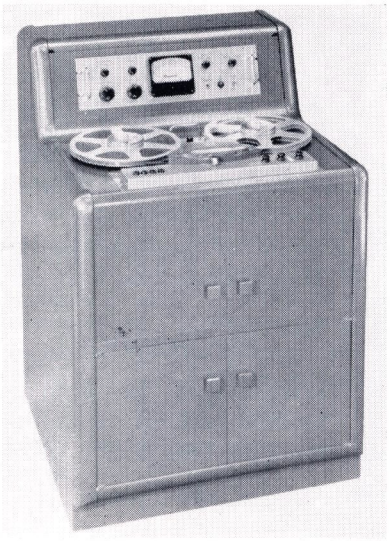
Record/Playback Amplifier

IMPEDANCES: Input. unbalanced bridging for 0 level recording.
Output, cathode follower unbalanced 20,000 ohms.
OUTPUT LEVEL: +18 dbm or less at 1.3% distortion.
METER: 4" VU reads bias, record and playback level.
EQUALIZATION: Standard NARTB.
PANEL SIZE: 5¼"x19".

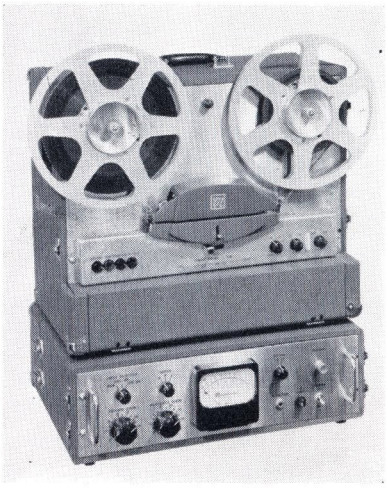
●

Tape transport mechanism 727AX
Record/Playback amplifier 727BX

TOP PROFESSIONAL M-90 SERIES MAGNECORD TAPE RECORDERS



M-90ACC



M-90AC

Nothing has been left undone to make this the finest of fine pros in the recording field. For the fine radio or television station or the recording laboratory doing advanced work, the M-90 has no superior. Available in console, portable and rack models.

TAPE TRANSPORT SPECIFICATIONS

TAPE SPEED: 7½ and 15 ips.
STARTING TIME: Less than 0.1 second.
STOPPING TIME: Less than 2 inches of tape at 15 ips.
TIMING ACCURACY: ±3 seconds in 30 minutes.
FLUTTER AND WOW:
Less than 0.1% RMS max. at 15 ips.
Less than 0.15% RMS max. at 7½ ips.
REWIND AND HIGH FORWARD: 10½-inch 2400 foot reel less than 55 sec.
PLAYING TIME:
32 minutes at 15 ips on 10½" NARTB reel.
64 minutes at 7½ ips.
FREQUENCY RESPONSE:
30 to 15,000 cps ±2 db at 15 ips.
40 to 12,000 cps ±2 db at 7½ ips.
SIGNAL-TO-NOISE: 58 db at 7½ and 15 ips (S/N for ½-track 55 db).
MONITORING: Front panel jack for impedance phones. (Microphone and line cues may be had at all times independently of tape motion).
AMPLIFIER SIZE: 19"x5¼".
TRANSPORT SIZE: 19"x12¼".
POWER SUPPLY SIZE: Integral with amplifier.
POWER CONSUMPTION (total): 290 watts.

AMPLIFIER SPECIFICATIONS

MINIMUM INPUT LEVEL:
Microphone: 90 dbm for zero level recording.
Balanced bridge: 15 dbm or .15 V for zero level recording.
Unbalanced bridge 0.015 V for zero level recording.

INPUT IMPEDANCE:
Mic.: 50 to 250 ohms balanced or unbalanced.
Balanced bridge: 160,000 ohms.
Unbalanced bridge: 100,000 ohms.
Pre-emphasis 8 db at 15 kc at 15 ips, 20 db at 16 kc at 7½ ips.

PLAYBACK AMPLIFIER:
Output level 6 dbm when meter indicates zero VU. 18 dbm at 1.3% total harmonic distortion.
Output impedance: 600 ohms balanced or unbalanced.
Noise: 66 db below playback level of a 1 kc signal.
Distortion: .6% at 6 dbm at 400 cps.
1.3% at 18 dbm at 400 cps.

Note: Playback characteristic of the M-90 is the same as the primary playback standard for magnetic recorders as defined by NARTB.

METERING: Bias, record and playback levels read on 4" VU meter. (Meter protected by switching to bias position when output exceeds 3 VU.)

ORDERING INFORMATION

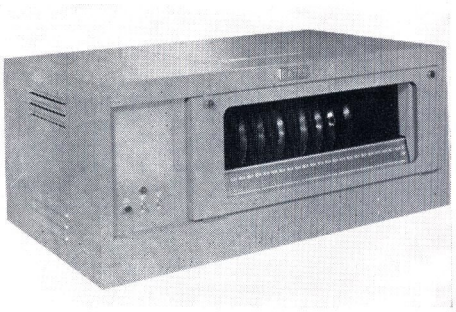
Console model includes transport and amplifier in beautiful cabinet 28" wide, 28" deep and 41" high M-90ACC

Portable model in two cases including transport and amplifier M-90AC

Rack model includes transport and amplifier for rack mounting .. M-90ACX

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100-RECORD AUDITORIUM SYSTEM

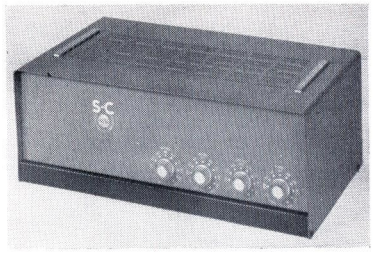


For the college student union, high school recreation room, restaurant and many applications where hours of automatic music from 45 RPM records can provide dance, concert, symphony or mood music.

Consists of special design record changer playing 100, 45 RPM discs on both sides or approximately 9 hours of music without attention. Changer is constructed in steel cabinet. Records may be set up in sequence of combinations desired and any record may be instantly rejected. Has dual diamond styli good for average 10,000 plays before replacement.

Standard equipment includes a Stromberg-Carlson 30-watt amplifier which may be mounted near or distant from the automatic record player. Amplifier will accommodate two microphones along with the changer and is capable of handling as many as 12 loudspeakers.

For loudspeakers, see Pages 220, 229.
For microphones, see Pages 227, 228, 229.



It is emphasized that this system is professional in every way and not to be confused with home record changers. This system may be as hi-fidelity in scope as the purchaser desires in the selection of loudspeakers as both the automatic record system and amplifier are Hi-Fi in design.

SIZE: (automatic changer in steel cabinet) — 38½" wide, 17½" deep, 16¼" high.
(amplifier) — separate unit unit shelf or desk mount.

RATING: From small rooms to auditoriums of 4000 seating capacity with proper speaker system.

CUSTOM REQUIREMENTS: Gates will gladly recommend proper speaker system by providing simple sketch of room or auditorium showing dimensions.

Auditorium system including 100-record changer in steel cabinet, 30-watt amplifier and instructions M-5666

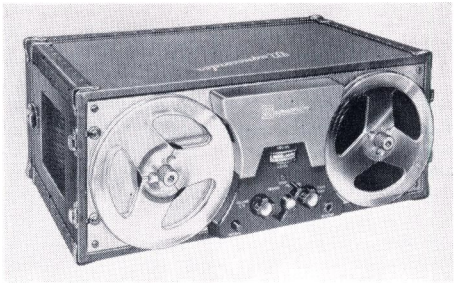
FM RELAY RECEIVER



Designed specifically for air pickup of FM broadcasting and re-transmitting at full 30-15,000 cycle response at distortion of 1% or better 50-15,000 cycles. Bandwidth 150 Kc, 88-108 Mc, antenna 72 or 300 ohms, output 150/600 ohms. Crystal controlled oscillator for absolute negative drift. Sensitivity 2 Mv. for 20 db quieting or 10 Mv. for 40 db quieting. Has monitor speaker, signal strength meter and 12 tubes plus rectifier. Rack mount 8¾" x 19". Please state frequency when ordering.

Relay Receiver CM-0

MAGNECORD S36-B



Here is a widely used professional tape recorder in the low priced field for real commercial results. Single unit has Hi-Z microphone and unbalanced bridging input. Playback amplifier output; 600 ohms balanced or unbalanced. Output level; +8 VU. Response 50-15,000 cycles. Tape speeds 7½" and 15" by capstan change. Hysteresis synchronous motor drive. Uses 7" reels. Rewinds in 40 seconds. Illuminated VU meter. Wow flutter 0.3%. Full track NARTB response. Panel 7" x 19" for rack mounting.

Tape recorder rack mount S36-BX
Same as above in portable carrying case S36-B

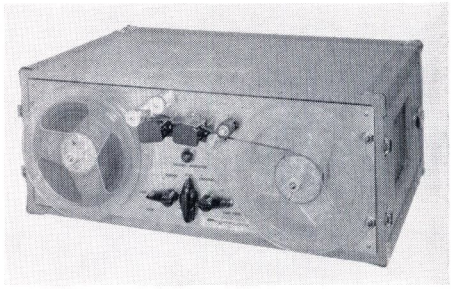
PENTRON NL2



A low priced, good quality recorder that will fill many needs where higher priced equipment not necessary. Tape speeds 7½" and 3¾". Supplied with microphone. Has dual speakers, 5 watt amplifier. Single rotary control for recording, index counter, interlocked record button, instant speed change, magic eye level indicator. Response 40-13,000 cycles at 7½". Two input jacks. Size: 10¾" high, 14" wide and 16¾" deep. Beautiful portable case. Twin track only.

Pentron recorder complete NL2

MAGNECORD PT6 SERIES



Often called "Mr. Tape Recorder" this famous pair of recorder and amplifier in early designs date back to the beginning of tape recording.—New and up to date in all respects, the PT6 Series is still the fastest selling professional recorder, designed for broadcasters, in its price range.

Hysteresis synchronous drive motor, 7½" and 15" speeds by switch on front, takes 7" reels with adapters for 10" reels available, NARTB equalization, 50 ohm and bridging input with enough gain for direct microphone recording, output 16 or 600 ohms. Big VU meter, 10 watt monitoring amplifier, internal monitor speaker and in rack or portable case models.

Response: 50-15,000 cps. at 15" or 50-7500 cps. at 7½". Flutter 0.3% or better at 15 ips. Panel size both models, 7" x 19". For a top quality unit in the medium price range—this is it.



ORDERING INFORMATION

Recorder unit rack mount PT6-6AX
Amplifier unit rack mount PT6-6JX
Recorder in portable case PT6-6A
Amplifier in portable case PT6-6J
10½" reel adapter arms, pair 93X28

Stock Branches are a Gates Exclusive . . .

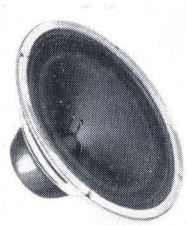
Gates stock carrying branch stores are established to serve broadcasters better.

GATES RADIO COMPANY
2700 Polk Avenue
Houston 3, Texas

GATES RADIO COMPANY
1133 Spring Street, N. W.
Atlanta, Georgia

www.SteamPoweredRadio.Com

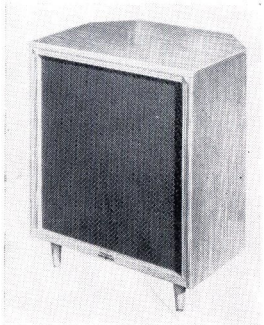
GE 12" LOUDSPEAKER



A 45-13,000 cycle, 12" loudspeaker with 9-ounce Alnico V magnet, 8 ohm voice coil to handle 25 watts program material. For fullest fruition suggest use with A1-406 enclosure listed below. Diameter 12 7/32". Highly recommended for topflight monitoring and audition.

GE 12" Loudspeaker 1203A

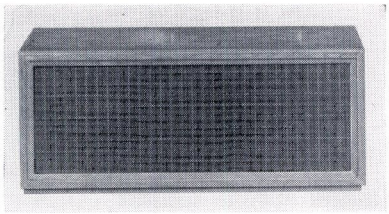
GE 6' SPEAKER CABINET



Features "distributed port" acoustical design for smooth, full low frequency response. For corner or straight wall placement. 31¼" high, 25 5/8" wide and 18¼" deep. Available in blonde, mahogany and unfinished. A beautiful cabinet in both performance and appearance, and modestly priced.

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

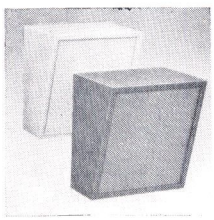
GE 8" SPEAKER ENCLOSURE



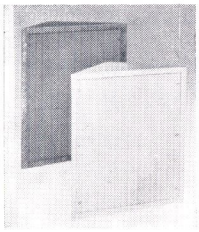
Only 10" high, this beautiful enclosure for 8" speakers may be mounted horizontally near the ceiling, on a shelf or vertically. Has "distributed port" acoustic design. A fine enclosure for audience or reception room. Size: 26" wide, 10" high and 11" deep.

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

WALL BAFFLES



Flat mount



Corner mount

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

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

CEILING BAFFLE



Spun aluminum, satin finish for 8" speaker provides 360° coverage. Mounts flush with ceiling.

Ceiling baffle AL8-A

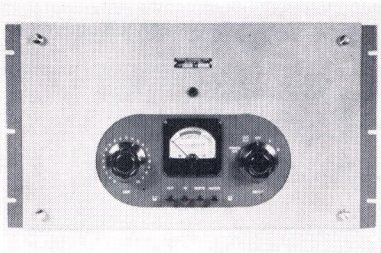
PRESTO 6N DISC RECORDER



The "Mr. Recorder" of the disc recording field. Illustrated in portable case but floor cabinet available for permanent use. Designed specifically for broadcasting station and recording laboratory. When used with the A93 amplifier, listed below, a wide variety of recording curves are possible ond will meet all currently popular standards. Records at 33⅓ or 78 RPM and simple adapter converts to 45 RPM. Feed screw supplied is 112 lines per inch inside to out. Feed screws of 96, 104, 120 or 136, either inside to out or vice versa, are available along with microgroove pitches of 244, 256 and 288. For 115 volts, 60 cycles. Cutting head impedance, choice of 15 or 500 ohms. Playback pickup 500 ohms.

Recorder, chassis only 6N
Recorder, in portable case (ilustrated) 6NP
Recorder, in floor cabinet 6NC
Adapter for 45 RPM GR45
Microgroove feed screw, 244 lines GR244

A93 RECORDING AMPLIFIER



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

Recording amplifier A93

PRESTO 1D CUTTING HEAD

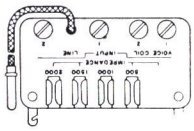
Recognized as the finest in the disc recording field. Very low distortion and flat response from 50-10,000 cycles. Available in 16 or 500 ohms. Illustrated on Presto recorders listed above.

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

RECORDING STYLUS

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

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



SPEAKER MATCHING TRANSFORMERS

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

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

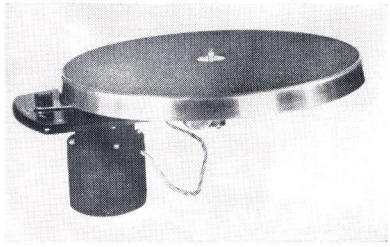
JENSEN PM SPEAKERS



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

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

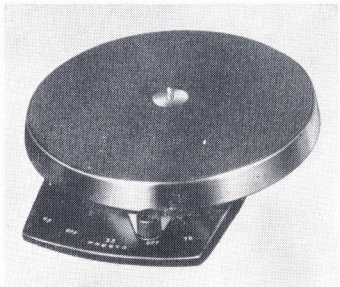
PRESTO T68 TURNTABLE



Three speeds, 16" platter, designed straightforward with hysteresis type motor. Operates all three speeds of 33⅓, 45 and 78 RPM with single speed shift lever. For 115 volts, 60 cycles.

Transcription Turntable T68H

PRESTO T18 TURNTABLE



Quite similar to T68 above but with 12" platter. Operates at 33⅓, 45 and 78 RPM with single shift lever to triple idler wheels. Hysteresis motor.

Presto 12" Turntable T18H

Gates wants you to know . . .
that the supply of every needed item is part of our business. Your small needs are treated with the same importance and urgency as the most expensive item in the Gates line.

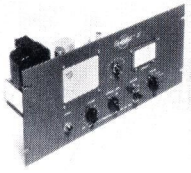
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CONELRAD RECEIVER



117R905

The new Conalert, 2 monitor Conelrad is specifically designed for Civil Defense and is FCDA approved Item 21. Required in all radio stations and very necessary in schools, hospitals, industries and those depending on Civil Defense. Continuously monitors all key radio stations to give warning for impending air attack. — Has 5 preset standard broadcast channels including 640 and 1240 Kc. Silent or audible monitoring, automatic visual and audible alarm, fail safe external alarm connection in case of receiver failure. Built in speaker. Seven tubes plus rectifier. Size (rack model): 19" x 8¾" x 9¾" deep. Cabinet model: 15" x 9" x 10½" deep. For 115 volts, 50/60 cycles.



117R906

Conelrad Receiver, cabinet model **117R905**

Conelrad Receiver, rack model **117R906**

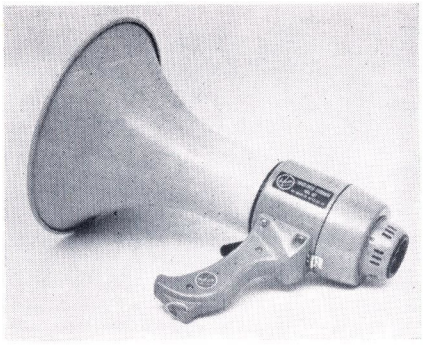
INDUSTRIAL MOBILE PHONE



A portable transmitter-receiver for industrial use such as talking from a fork lift to office, one fork lift to another or any mobile short range use up to one mile. Operates from 6 or 12 volts DC or 117 volts AC. Supplied with microphone, crystals, power cable and antenna. Use FCC Form 400 for easily obtained license. Power of transmitter, 3 watts. Accepted by FCC under Parts 9, 10, 11 and 16. State crystal frequency when ordering.

Industrial mobile phone for 30-50 Mc **TR-325**
Industrial mobile phone for 152-174 Mc **TR-426**
Industrial mobile phone for 108-152 Mc **TR-426A**

TRANSISTORIZED LOUDHAILER



The newest thing in electronic megaphones of tremendous power for commercial, industrial and sports. No tubes, yet supplies 3 watts with a small battery pack that will last approximately six months. Speak into one end and a loud clear voice covering easily 400 yards comes out the other. Size: 15½" long, 10½" bell. Weight, 5 lbs. FCDA listed Item P-2.

Loudhailer **5907**
Battery kit **GR-120**

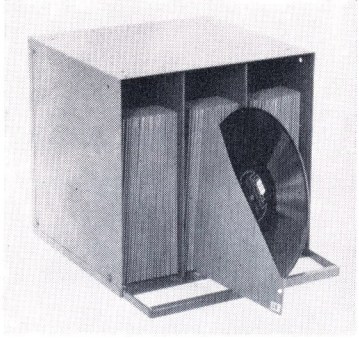


CONTROL ROOM CHAIR

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

Control Room Chair **255**

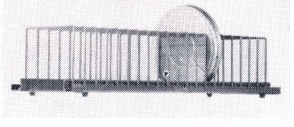
SECTIONAL DISC CABINETS



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

Record size	Width	Height	Depth	Pocket Cap.	Cat. No.
7"	13 1/8"	9"	9"	90	A-7
10"	13 1/8"	12 3/8"	12"	90	B-10
12"	13 1/8"	15 5/8"	14"	90	C-12
16"	13 1/8"	20 5/8"	20"	90	D-16

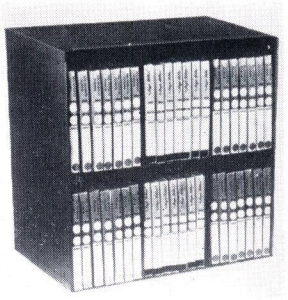
FILM SEPARATORS FOR 16MM REELS



Heavy wire separators on metal base with card holders for indexing. Length, 29".

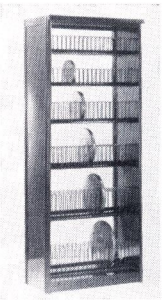
Capacity	Cat. No.
22—400' reels	SR-420
20—600/800' reels	SR-6820
20—1200/1600' reels	SR-1216

TAPE CABINETS



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

Holds 21 reel boxes of 10½" tape reels. 13 1/8" wide, 12 5/8" high, 12" deep. Has three compartments. May be stacked as desired. **TR-1021**



FILM CABINET

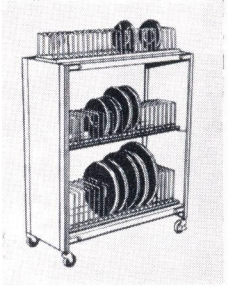
Closed top, base and sides. Open front and back. Equipped with separator racks adjustable to 1" centers. Gray enamel finish. Size: 30" wide, 75" high, 15" deep. Capacity: 44-400' reels, 20-600/800' reels, 1200/1600' reels. Size computed with reel cans.

Film Cabinet **F50-6120**

FILM REELMOBILE

Accommodates up to 27-400' reels, 25-600/800' reels and 25-1200/1600' reels. 3" moulded cushion-tread swivel casters, two with brakes, made of steel, finish gray. Film separator racks adjustable vertically on 1" centers. Size: 41½" high, 15" deep and 36" wide.

Film Reelmobile **RM-77**



DISC REELMOBILE

Same as above but equipped with your choice of four sectional disc cabinets listed in center column. When ordering, state what sectional disc cabinets are desired.

Disc Reelmobile with four sectional disc cabinets **DM-360X**



DISC CABINET

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

Disc Storage Cabinet **C-540**

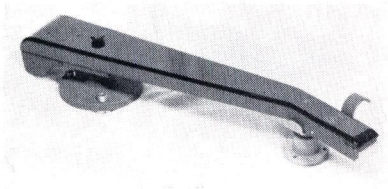
SEE PAGE 147 FOR NEW RECORD-TAPE SERVICE CABINET

FOR AFTER HOURS SERVICE

If you have an emergency we want to help any time — night, wee hours, holidays. — Place your call to Baldwin 2-5088, Quincy, Illinois and they will put you in touch with the proper Gates person assigned to emergency service. — For emergencies, call the telephone number and not by company name.

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GRAY VISCOUS-DAMPED ARM



Considered one of the truly fine professional arms used in broadcasting today. Handles 16" discs or smaller. Features perfect tracking, adjustable dampening and viscous-damped feature almost eliminates fractured styli by dropping on record. Use with GE triple or single play reluctance pickup heads. Page 131.

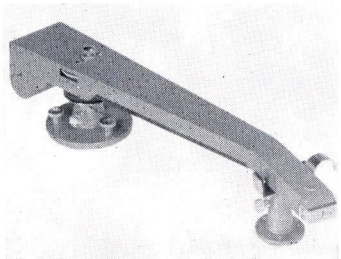
Gray Viscous-Damped Arm ..... **Cat. 108-C**

GRAY MICROBALANCED ARM

Fully viscous-damped with both vertical and horizontal pivots. Features maximum tracking stability and complete static balance around the vertical pivot. Made by Gray. Use with single or triple play cartridges on Page 131.

Microbalanced arm (for 16" discs or less) **216**

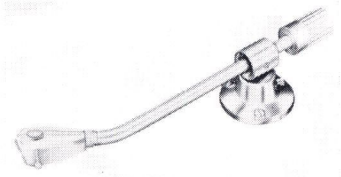
VISCOUS DAMPED ARM



This new model, only recently introduced into the United States, employs the floating action viscous damped principle. Supported at one point by needle bearing and jeweled pivot in ball and socket assembly in silica oil dampening fluid. Has variable side adjustment for exact stylus pressure. Accommodates all reluctance cartridges including triple plays as listed on Page 131. For 17" discs or less.

Viscous damped tone are **GR-16**

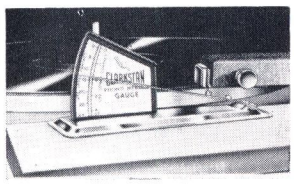
TUBULAR TRANSCRIPTION ARM



Adjustable for turntable height, dual ball bearing races for horizontal movement and vertical movement pivots in 1 MM. chrome steel ball bearings. Stylus pressure adjustable by self locking, threaded counterweight. Handles all GE cartridges listed on Page 131. Has tubular arm body.

Transcription arm for 16" or less records **160**
Transcription arm for 12" or less records **120**

STYLUS FORCE GAUGE

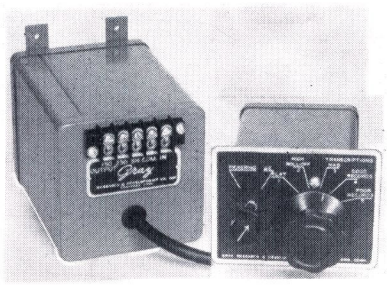


An inexpensive yet very needed item wherever transcriptions are used. Measures pressure in grams of stylus on record.

Stylus gauge **301**

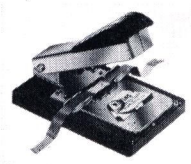
FOR PICKUP CARTRIDGES AND PREAMPLIFIERS, PLEASE REFER TO PAGE 131.

GRAY EQUALIZER



Four-position equalizer for use with any low impedance pickup cartridge (Page 131) and provides these curves: (1) latest NARTB/AES, (2) intermediate, (3) roll off, and (4) flat response. Output impedance 150 ohms. Supplied as illustrated with etched dial plate and knob. Suggest M-5330 preamplifier listed Page 156. Made by Gray.

Transcription Pickup Equalizer **602-C**



TAPE SPLICER

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

Gibson standard splicer **TS4H**

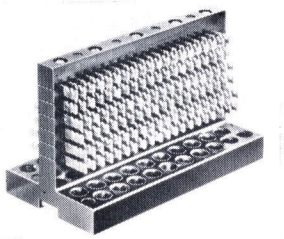
Industrial Tape Splicer



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

SIZE	Cat. No.
For 1/4" tapes	TS-250
For 1/2" tapes	TS-500
For 5/8" tapes	TS-625
For 3/4" tapes	TS-750
For 1" tapes	TS-1000

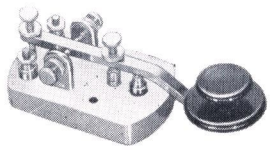
AUDIO TERMINAL BLOCK



Has 120 terminals in six rows. Molded one-piece phenolic block with base 3 1/2" x 6 1/8". Height 3 1/2". Terminals plated brass. Polished phenolic finish makes easy removal of solder splash.

Audio terminal block **PT-106**

HEAVY DUTY KEY



Large 1/4" coin silver contacts, chrome base. Navy type knob. Adjustable steel bearings and well designed spring give light keying touch. Finest hand key money can buy.

Telegraph key **114-321**

HEAD PHONES



Brush dual crystal unit as illustrated. Smartly styled, unusually sensitive and dependable. For all professional service.

Dual head set **BA-200**

Brush single head set with head band. Otherwise same as dual unit above.

Single head set **BA-201**

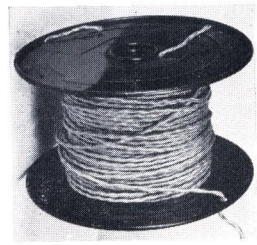
Trim dual head set, feather weight model, long recognized as an industry leader. Impedance 24,000 ohms.

Trim dual head set **107**

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

Trim S head set **35-3**

STUDIO AND MICROPHONE CABLE



Studio Cable

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

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

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

Shielded 2-conductor No. 18 stranded for power cabling. Has rubber insulation and overall rubber jacket. OD 0.295". Available in 50' and 100' spools. **8428**

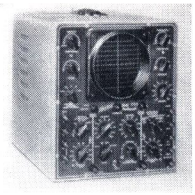
Microphone Cable

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

Single conductor shielded rubber jacketed microphone cable **8410**

If You Didn't Get This From My Site,
Then It Was Stolen From...
www.SteamPoweredRadio.Com

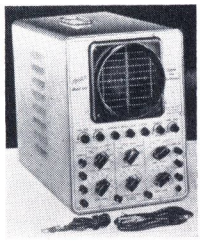
5" OSCILLOSCOPE



This Hickok large commercial scope is one of the industry's most popular. Frequency response wide band DC to 5 Mc and narrow band to 2.5 Mc within 3 db. Uses 5ADP1 flat faced cathode ray tube. Complete in every detail including illuminated calibrated green screen and filter. Size: 14"x12"x18" deep. For 115 volts, 50/60 cycles.

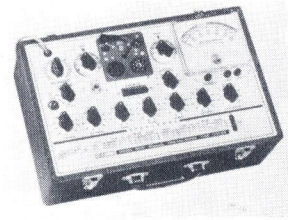
5" Oscilloscope **770**

PORTABLE 5" OSCILLOSCOPE



This technician's model portable scope in the popular price class will fill all practical needs in AM radio and industrial testing. Response DC to 750 Kc within 3 db. Illuminated calibrated screen with green filter. Uses 5UP1 cathode ray tube with sharp trace detail. Size: 13" high, 10" wide, 16" deep. For 115 volts, 50/400 cycles.

Portable Oscilloscope **685**

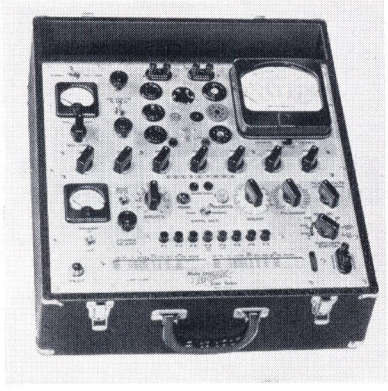


PORTABLE TUBE TESTER

Accommodates over 95% of all tubes in use today including new 11-pin socket and many foreign tubes. Along with standard requirements of a good tester, this model reads: grid current (gas) test, filament continuity test, constant indication of line voltage and Hickok famous roll chart for speedy data on tube to be checked. 17" wide, 11¾" long, 7½" deep.

Portable tube tester **6000**

INDUSTRIAL TUBE TESTER



A rugged industrial tester to serve almost every conceivable need. Tube leakage reads directly on meter scale, provision for measuring plate milliamperes and heater current. Outstanding feature is separate rectified DC voltage applied to each tube element in dual tubes permitting accurate balancing of such tubes as the 6SN7. Also tests selenium rectifiers and germanium cycles.

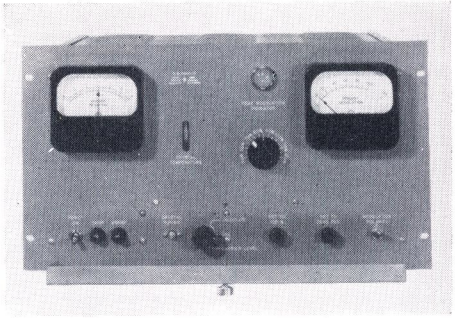
Industrial tube tester **539B**

BLANK RACK PANELS

Made of 3/16" half hard flat aluminum stock 19" wide, punched standard relay rack mountings and finished in medium gloss gray. These are not the skimpy 1/8" blank panels but standard commercial thickness, available all widths from 3½" to 19¼" in 1¾" multiples.

Blank panels, per 1¾" multiples **BL-1**

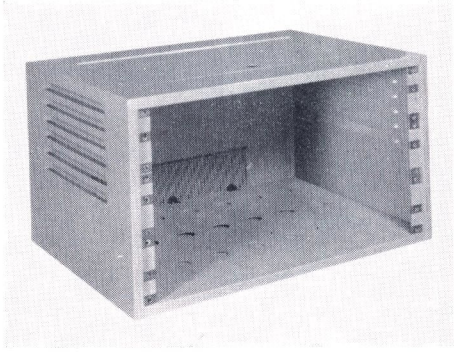
FREQUENCY MODULATION MONITOR



Made by Hewlett-Packard and FCC approved for measuring frequency and modulation percentage of standard FM broadcasting stations with ±75 Kc swing. An accurate laboratory type instrument used in scores of FM stations. Be sure and state frequency when ordering. Panel size: 10½" x 19". For 115 volts, 50/60 cycles.

FM Monitor **335B**

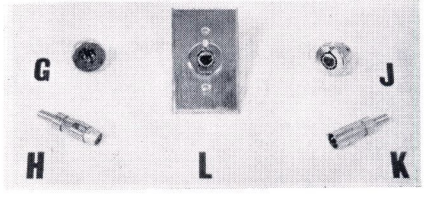
DESK RACK CABINET



Styled and finished in gray to match all Gates equipment as well as standard industry requirements. Holds 10½"x19" rack panel space with 14" inside depth clearance. Hinged lid and well louvered for ventilation. Size: 20¼" wide, 11¾" high, 15" deep.

Desk rack cabinet **M-5644**

CANNON XL CONNECTORS



Popular small size Cannon connector used universally in radio and TV.

Symbol	Description	Cat. No.
G	Chassis receptacle, male, 3 prong	XL3-14
H	Cable receptacle, female, 3 prong	XL3-11
J	Chassis receptacle, female, 2 prong	XL3-13
K	cable plug, 3 prong, male	XL3-12
L	Single, 3 prong, female, wall plate	XL3-35
—	Double, 3 prong, female, wall plate	XL3-35-2G

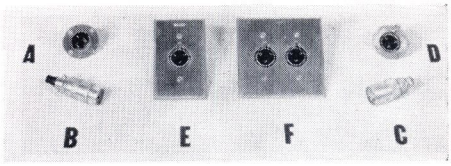


VOLT-OHM-METER

This new improved Simpson model is the broadcaster's right hand. Over ¾ million in use. Reads DC and AC voltage to 5000V, volume level in db to +50 db, resistance to 20 megs, and DC milliamperes to 500 and amperes to 10. With test leads.

Volt-Ohm-Meter **260**

CANNON P CONNECTORS



Long a popular, heavy duty connector in radio and TV. Approximately 1 1/8" in diameter.

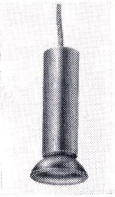
Symbol	Description	Cat. No.
A	Receptacle for chassis mounting, male, 3 prong	P3-14
B	Cable receptacle, female, 3 prong	P3-CG-115
C	Cable plug, male, 3 prong	P3-CG-125
D	Receptacle for chassis mounting, female, 3 prong	P3-13
E	Wall plate with 3 prong female receptacle	P3-35
F	Wall mounting with two 3 prong female receptacles	P3-35-2G

TAPE ERASER



Bulk tape demagnetizer developing high intensity magnetic field. Erases recorded signals and noise completely and restores tape to like new condition. Handles 5", 7" and 10½" reels. Adapter hub available (optional accessory) for 10½" reels. 117 volts, 50/60 cycles.

Tape eraser **HD-11**

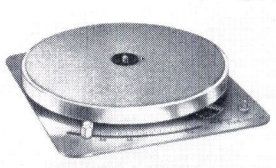


TELEPHONE PICKUP COIL

For transcribing telephone conversations with recorder. Suction cup attaches unit to telephone receiver. Supplied with 6½' cord. Must be used in accordance with Federal law. Size: 5/8" diameter and 2 3/8" long.

Telephone pickup coil **HP-61**

VARIABLE SPEED TURNTABLE



Here is a product with wide versatility. A lever on front adjusts speed from 16 to 83 RPM with exact settings at 16⅔, 33⅓, 45 and 78 RPM. 12" turntable, built in stroboscope, 45 RPM hub supplied and wow less than 0.2% RMS. Ideal for sound effects table as well as standard record player. Mounting plate size: 11¾"x13¼".

Variable speed turntable **60**

VACUUM TUBE VOLT-OHM-METER



A new Simpson product indispensable in maintenance. Has 22 megohm input impedance, twice as high as any instrument in its class. Single DC/AC/ohms probe. Handles RF voltages to 150V RMS. Seven DC ranges to 1500V, seven AC ranges to 1500V. Peak to peak to 4000V. AF voltages (30-100 Kc ±5%) to 1500V ohms to 1 meg. in 7 ranges.

Volt-Ohm-Meter **311**
RF probe for above **0073**

www.SteamPoweredRadio.Com

NATIONAL NC-66



A portable receiver to cover the 150-400 Kc band as well as .50-1.4 Kc (broadcast) and 1.4 Kc to 23 Mc. AC or battery operated. Inbuilt ferrite loop antenna and whip antenna. Ideal for all purpose portable short wave and broadcast with excellent performance on marine bands for boat owners. Size: 12¼" x 9¾" x 10". Weight, 16 lbs., less batteries.

Portable receiver NC-66

NATIONAL NC-109



Low price, yet top quality with full 540 Kc to 40 Mc coverage. Has crystal filter, separate product detector for CW and single sideband reception. Has large S meter and covers entire range in four bands. Size: 16¾" x 10" x 10⅞" deep. Finish, gray. 115 volts, 50/60 cycles.

Communications receiver NC-109

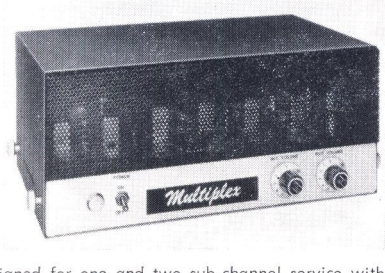
NATIONAL NC-188



Four general coverage ranges 540 Kc to 40 Mc for phone and CW. Also 5 band spread ranges 80-10 meters. A truly fine communications receiver at very low cost. Size: 16¾"x10"x11" deep. 115 volts, 50/60 cycles.

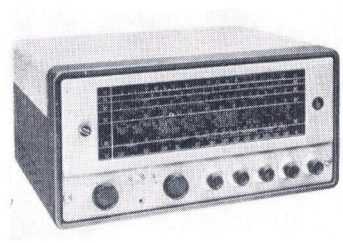
Communications receiver NC-188

MULTIPLEX RECEIVER



Designed for one and two sub-channel service with FM multiplexing in 88-108 Mc band. Used with multiplex transmitter on Pages 64-74. Further details on request.

HALLICRAFTERS SX-62A



All purpose receiver for AM and FM. Tunes 550-1620 Kc and 1620 Kc to 32 Mc, plus FM band from 29 to 109 Mc. Fourteen tubes plus rectifier. Temperature compensated, voltage regulated and 6-position selectivity. 20" x 10½" x 16" deep. 115 volts, 50/60 cycles.

All purpose receiver SX-62A

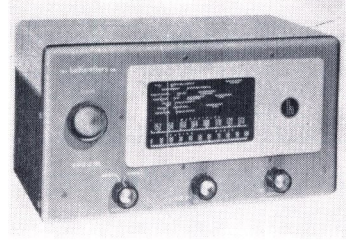
HALLICRAFTERS SX-100



Topflight communications receiver with double conversion super-het over entire frequency range of 538 Kc to 34 Mc. Precision gear drives, selectable sideband reception of both suppressed and full carrier. Twelve tubes plus rectifier. 18 3/8" x 8½" x 10¾" deep. Tee notch filter and 100 Kc crystal calibrater. 115 volts, 50/60 cycles.

Communications receiver SX-100

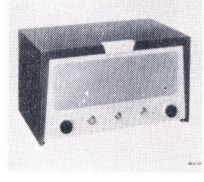
HALLICRAFTERS SX-104



Model SX-104 is for 30-50 Mc, and SX-105 for 152-173 Mc. Quartz crystal control or tunable. Built in squelch. Nine tubes plus rectifier. Size: 13" x 7" x 7¾" deep. 115 volts, 50/60 cycles.

For 30-50 Mc SX-104
For 152-173 Mc SX-105

ALERT RECEIVERS



Meets Civil Defense Certifications R-74 and R76. A crystal controlled receiver for the 25-50 Mc or 144-174 Mc FM bands. 11 tubes plus rectifier. 1.5 microvolt sensitivity. Loudspeaker level output. For 115 volts, 50/60 cycles. Be sure and state crystal frequency when ordering.

Receiver for 30-50 Mc MCA-100L
Receiver for 144-174 Mc MCA-100H



TURNTABLE FM RECEIVER

For 30-50 or 152-174 Mc bands. Seven tubes and rectifier. Inbuilt 5" speaker. 115 volts, 50/60 cycles. 4 microvolt sensitivity.

For 30-50 Mc MR-33
For 152-174 Mc MR-10

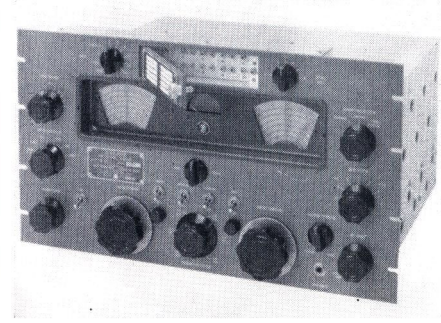
TMC MODEL GJR-90



One of the finest professional communications receivers in the world today with double emission super-het and frequency range from 540 Kc to 31 Mc. Receives AM, CW, MCW and SSB. Sensitivity better than 1 microvolt. Fourteen tubes plus rectifier and regulator. Size (cabinet): 20" x 10" x 15" deep. Rack mounting: 19" x 8¾" x 14" deep. For 115/230 volts, 50/60 cycles.

Professional receiver GPR-90

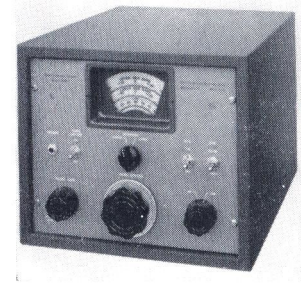
SSB CRYSTAL CONTROL



This TMC receiver offers all of the features of the GPR-90 above but permits the use of 10 precisely adjustable crystal positions available from the front panel for stabilities in SSB and point to point or net operations becomes simple and straightforward. Frequency range 540 Kc to 31 Mc in 6 bands. Sensitivity 1 microvolt or better. Fifteen tubes plus rectifier and regulator. Size: 19"x10½"x14" deep. 115/230 volts, 50/60 cycles. Uses CR 18/U crystals.

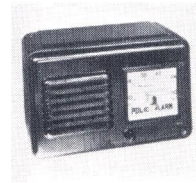
Receiver complete GPR-90RX

SINGLE SIDEBAND ADAPTER



Will adapt to any receiver which will provide 0.3 volts (RMS) RF input at 455 Kc. Is a filter type slicer for accurate SSB tuning. The 455 Kc input is converted to low frequency with a mixer/oscillator for selection of either sideband. Has electrical band spread for easy tuning of SSB. Output is at loudspeaker level. Size: 12" x 10" x 15" deep. For 115 volts, 50/60 cycles.

TMC SSN Adapter GSB-1



POLICE ALARM

For listening on 30-50 Mc FM band. Ideal for staff monitoring in standby service. Self-contained loudspeaker. For 115 volts, 50/60 cycles.

Police Alarm PR-31

www.SteamPoweredRadio.com

REMOTE CONTROL SYSTEM
(for Communications)



A complete remote control system with microphone for operating a communications transmitter and receiver over 20 miles or less on a single telephone line. Features are:

1. Turns line power to transmitter, on and off.
2. Keys transmitter (puts transmitter on and off the air).
3. Selects one of 3 channels or one of 3 transmitters.
4. Amplifies and reproduces audio from receiver (over same pair of wires).
5. Adjusts squelch on receiver.
6. Provides intercom to transmitter location.
7. Includes "press to talk" dynamic microphone.
8. Automatic gain amplifier (limiter).
9. Large 4½" meter reads audio level.
10. 300-3000 cycle response for communications.
11. 5" speaker self-contained.
12. Provision for foot key.

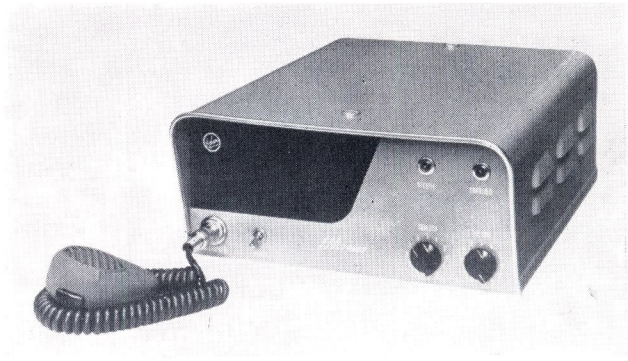
EQUIPMENT FURNISHED INCLUDES: (a) dynamic microphone with press to talk desk stand, (b) remote control unit as illustrated, and (3) switching line amplifier on rack mount 3½" x 19" panel.

All equipment is self-contained except the switching line amplifier which requires 6.3 volts at 0.3A at 200/300 volts DC at 15 MA of external power. — This remote control system has unusual versatility and will adapt to nearly all needs. In some instances of multi-channel and power switching, added relays easily procurable from standard sources, might be required.

SPECIFICATIONS: For 115 volts, 50/60 cycles. Output level adjustable to +14 dbm. Size: 15" long, 9" high and 10¼" deep. Noise, 46 db below 0 level. Squelch, 0 to −20 volts to remote receiver. Tubes: 12AU7, 12AX7, 6AQ5, 6J8 and 5Y3GT.

Remote Control System, includes microphone 117C903

CITIZENS BAND TRANS-CEIVER



Here is a brand new transmitter and receiver for the 450-470 Mc citizens band. The first modestly priced unit that may be easily licensed to "service" and "industrial" organizations. Operates either on 12 volt car battery or 115 volts AC. Field and base station are identical for complete compatibility and interchangeability.

One cabinet 13" wide, 14½" long and 5¾" high contains the complete transmitter-receiver package which includes self-contained loudspeaker and press to talk microphone. When combined with the Model 4002 whip antenna for mobile or permanent installation, nothing else is required.

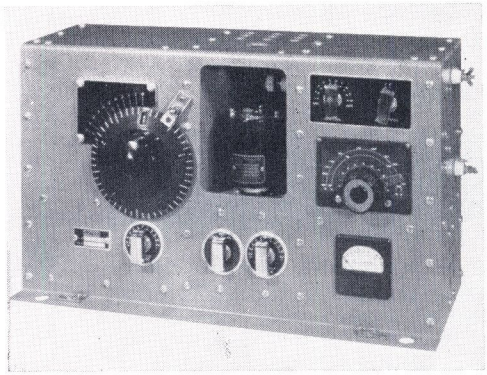
Mileage range of this equipment cannot be definitely stated as location has varying effect. The TR500 citizens unit has 10 watts input or 40 to 50 watts output which is in excess of normal citizens band equipment. Under normal conditions, coverage or several miles can be expected.

SPECIFICATIONS: 100 db down selectivity at ±50 Kc. Band pass, 6 db down at ±20 Kc. Sensitivity, better than 20 db quieting for 1.0 UV input. Squelch range, 0-1 UV. Stability, ±.0025%. Duty cycle 20% or 1 minute transmit to 4 minute receive. Response, 300-3000 cycles. Spurious emission, 60 db below fundamental or better. — Made by Kaar.

Citizens band unit complete* TR-500
Whip antenna A-4002

*** State frequency when ordering.**

VFO-CRYSTAL OSCILLATOR-AMPLIFIER



A specially designed unit for 540-1600 Kc operation providing the stability of crystal control on the operating frequency or switch to VFO for change to any broadcast frequency. Has calibrated dial in 10 Kc steps with 1-1500 dial and 200 cycles/div. straight line. Stability, crystal ±10 cycles. VFO ±200 cycles under normal operating conditions. Output, 2 watts at 70 ohms. — Size: 19" wide, 10½" high and 6½" deep. Further detail on this precision instrument will be supplied on request.

VFO/Crystal Oscillator-Amplifier M-4230
Crystal and oven (state frequency) JK-57

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KLIEGL FRESNEL LENS SPOTLIGHTS

Front and back spindle adjustment control. Heat resisting lens. Perfect light control without spill light or side glare. Adjustable from wide spread to minimum spot. Includes 3' asbestos leads and connector.



3" lens, 100/150W lamp **44N3TVG**

6" lens, 500/750W lamp **44N6TVG**

8" lens, 1000/1500/2000W lamp **44N8TVG**

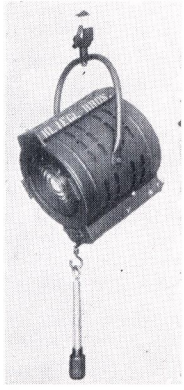
12" lens, 2000W lamp **44N12TVG**

19" roller caster floor stand for 6" and 8" lens models **1420CR**

25" roller caster floor stand for 8" and 12" lens models **1421CR**

KLIEGL POLE-OP 8" FRESNEL

Turns, tilts, adjusts barn doors — all by pole — from studio floor. Has 8" fresnel lens and basic light design very similar to 44N8TVG listed above. Includes C clamp, swivel, asbestos leads and connector. Pole is accessory item. Size: 23½" high, including cradle. 13" wide and 13" deep.



Pole-Op Klieglight **44NP8G**

Sectional 12' pole, handle and loop **44**

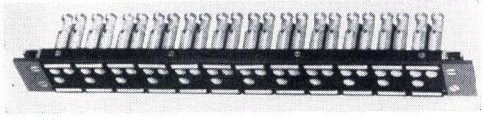
LAMP SIZES

For fresnel lights listed above, use following lamp sizes:

44N3TVG ..... **100/150W Bayonet Base**
44N6TVG ..... **500/750W T20 Med. PF Base**
44N8TVG ..... **1000, 1500, 2000W, G40 Mog, PF Box**
44NP8G ..... **1000, 1500, 2000W, G40 Mog. PF Box**
44N12TVG ..... **2000 watt, G48 Mog. BP Base**

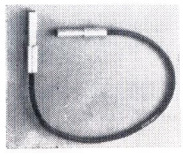
IMPORTANT: See price list for added discount to regular Kliegl light users applicable to TV stations.

VIDEO PATCH PANEL



For patching coaxial circuits. 12 groups of 3 jacks on a strip 2 1/8" x 19". Contacts heat treated beryllium copper. Outer braid of coaxial cable may be soldered directly to jacks for complete shielding. Patch cords and plugs listed and illustrated below.

Video patch panel **963**
Looping plug **965**
18" patch cord **967A**
24" patch cord **967B**



967



965

KLIEGLIGHTS

Klieglights are spot-flood lights and differ completely from plano-convex and fresnel lens units. Klieglights have been perfected to a degree that arc spotlights are no longer needed. Produce a brilliant, clear, uniform light, easily controlled and molded into any desired pattern. Perfect for highlighting areas or front spotlighting. Outstanding when used with projected scenery, as beam can be cut at any point. Available in hanging and floor models.



Model 1365EG

Klieglight for 250/500/750 watts T14 Med. bi-post base, up burning spot lamps. Included are reflector, 4 independently adjusted square framing shutters, 6" stepped lens, asbestos wires, yoke and C clamp. Hanging type **1365EG**

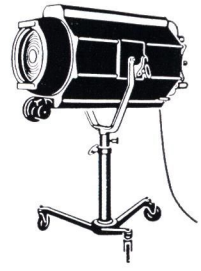
Same as 1365EG but with built-in iris shutter **1365EG-IRS**

Same as 1365EG but for 1500/2000 watt T base up burning, 200 hour life lamps **1366EG**

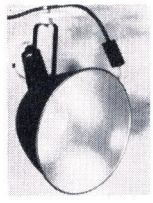
Same as 1366EG but with built-in iris shutter **1366EG-IRS**

Super Klieglight for 2000W T30 base up burning lamp. Rear operated curtain and iris shutter, 12" lens. Includes 25' cable, roller caster floor stand and switch. Rating, 450 foot candles at 4', spot at 25' **1174G**

Dyna-beam Klieglight similar to 1174G above but uses 3000W T32 base up burning lamp. Added feature, inbuilt rear operated horizontal spread lens which doubles width or projected spot when desired. Rating, 1000 foot candles at 4', spot at 25' **1178G**



Floor model similar to 1174G and 1178G

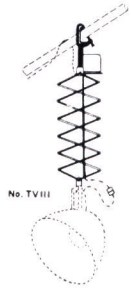


KLIEGL 18" SCOOP LIGHT

Popular Kliegl light has socket cap with universally adjustable yoke and C clamp, permitting straight down as well as up lighting. Spring tension adjustment. Light weight, ideal for field work. Hood of 16 gg. Alzak-finished aluminum. Includes 3' asbestos leads, connector and takes PS52 lamps from 750W to 2500W in size.

Scoop Light **TV1155G**



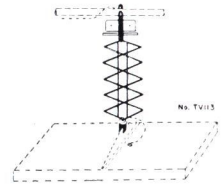


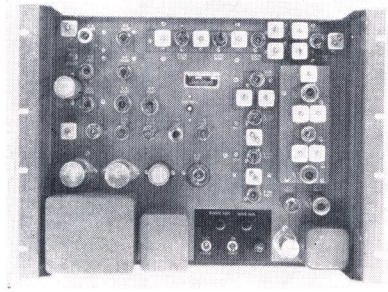
HANGING DEVICES

Single spring counter-balance raising and lowering device for use with models TV111 scoop and 44N6TVG fresnel lens units, 360° horizontal rotation and vertical tilt. Illustrated to left. Ideal method of positioning light where needed **TV111**

Same as TV111 only designed to hold fresnel lens model 44N8TVG **TV112**

Double spring counter-balanced device as illustrated to right for use with 44N12TVG fresnel lens light **TV113**





TV REBROADCAST RECEIVER

High quality receiver used in rebroadcasting TV signals. 3 outputs, video, audio and sync. Sound and video channels are separate. Frequency control is excellent to point that drift on channel 13 is negligible.

SPECIFICATIONS

VIDEO: Output 75 ohms at 1.5 volts peak to peak and response to 4 Mc.
AUDIO: Output +18 dbm, 600/150 ohms, 30-15,000 cycles. Distortion, 1% or less.
SYNC. Output 75 ohms at 4 volts peak to peak.
OTHER: RF input 75 ohms. Power, 115 volts, 60 cycles. Size: 19"x13¾"x8¾" deep.

TV Receiver **TR-1**

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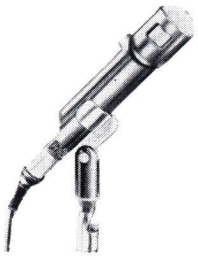
Now, more than ever, Electro-Voice microphones are being purchased for exacting professional applications.

Since the advent of TV, concrete evidence is visible daily on any TV screen of the popularity versatility, and superior performance of E-V microphones.

For over 30 years, Electro-Voice, through progressive engineering and manufacturing skill, has devoted itself to the needs of the broadcast and TV industry. As specialists, Electro-Voice conceived the slim-trim design in dynamic microphones which has so facilitated improved programing and audio quality in recent years. Mindful of the requirement for dependability in modern broadcast work, Electro-Voice created Acoustalloy, the famous diaphragm material which met the need for rugged reliability in strenuous operation, and vastly reduced station overhead costs in microphone servicing. Electro-Voice has obsoleted the use of fragile ribbons in directional microphones, and made possible superior discrimination against unwanted sounds through development of the dynamic Variable Distance principle.

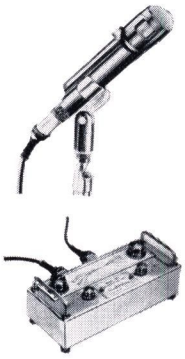
These features, and many more, make Electro-Voice the choice for your station.

CARDIOID MICROPHONES



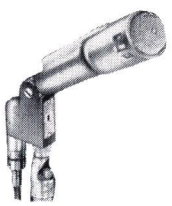
MODEL 666 VARIABLE D DYNAMIC

A superior cardioid microphone with uniformly excellent front-to-back discrimination, wide-range response. For boom, hand, desk, or floor stand operation under a variety of conditions, especially useful where noise and severe reverberation exist. At least 20 db front-to-back discrimination across the spectrum. Proximity effect is virtually eliminated. 30 to 16,000 cps response. Variable 50, 150, 250 ohms output at —55 db. Cast aluminum case, TV gray finish. Clamp-on stand mount with 5/8"-27 thread and 1/2" adapter. 20' cable with UA-3 connector. Size: 7 1/2" l., 1 3/4" max. dia. Net wt. 11 oz.



MODEL 667 TRANSISTORIZED DYNAMIC

This all-purpose microphone fulfills wide-range requirements under a great variety of acoustic conditions. Combines excellent cardioid operation with an in-line transistor preamp; controls provide 40 distinct frequency response characteristics. Max. output level: 50 ohms, —30 db; 150 ohms, —32 db; 250 ohms, —33 db. Similar to 666 except 35 to 16,000 cps response, brown and gold finish. Preamp noise level —123 db referred to input. Controls: Bass (+3 db, flat, —5 db, —9 db at 100 cps); Treble (+9 db, +6 db, +3 db, flat, —6 db at 10kc); Gain (4-position); Presence (+6 db at 3.5 kc, + 1 db at 2 and 6kc); Power On-Off. Long-life mercury battery supplied. Net wt. 3 1/4 lbs. 50', 20' cables with UA-3 connectors; hardwood carrying case.



MODEL 665 VARIABLE D DYNAMIC

Similar to Model 666 in performance but for slightly less exacting requirements. 40 to 15,000 cps response. Recessed switch permits 50 or 250 ohms output at —55 db. Die cast case with nonreflecting gray finish. 5/8"-27 thread; 18' cable, XL-3 connector. Size: 7 3/16" l., 1 7/8" max. dia. Net wt. 1 lb. 10 oz.



MODEL 664 VARIABLE DYNAMIC

A good medium-price cardioid, similar to Model 666 in operating principle. 40 to 15,000 cps response. 150-ohm and Hi-Z output at —55 db. Chrome finish, cast case. 18' cable, MC-4 connector. 7 3/16" l., 1 7/8" dia. Net wt. 1 lb., 10 oz.

OMNIDIRECTIONAL MICROPHONES



MODEL 655C SLIM-TRIM DYNAMIC

The finest TV-BC microphone—widest range commercially available, 40 to 20,000 cps. Widely used as laboratory standard. Outstanding for single-mike applications. 50, 150, 250 ohms at —55 db. Adjustable clamp-on stand mount, 5/8"-27 thread, 1/2" adapter, TV gray finish. 20' cable, UA-3 connector. Size: 10 1/2" l., 1" dia. Net wt. 11 oz.



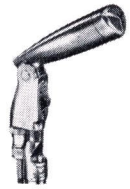
MODEL 654 SLIM-TRIM BC DYNAMIC

Functional slim-trim styling; similar to Model 655C in design, but for slightly less exacting applications. A high-quality unit for remotes, man-on-the-street shows, and all-around studio use. 50 to 15,000 cps response. Recessed switch selects 50 or 250 ohms output at —55 db. Tiltable head; TV gray finish; 18' cable, XL-3 connector; 5/8"-27 thread. Size: 10" by 1". Net wt. 15 1/2 oz.



MODEL 636 SLIMAIR DYNAMIC

Fine general purpose microphone with style and quality of the Model 655C. 60 to 15,000 cps response. Hi and Lo-Z at —55 db. Tiltable head; On-Off switch; chrome finish. 5/8"-27 thread. 18' cable, MC-4 connector. 10 1/4" l., 1 1/8" dia. Net wt. 15 oz.



MODEL 623 SLIM DYNAMIC

A good versatile performer in a medium price slim-style mike. 60 to 12,000 cps. response. 150 ohms and Hi-Z output at —57 db. Tiltable head; chrome finish. 18' cable, MC-4 connector; 5/8"-27 thread. Size: 7 1/2 by 1 5/16". Net wt. 15 oz.



MODEL 635 BROADCAST DYNAMIC

"Workhorse of the industry" for remote pickups, announcing, studio work. 40 to 15,000 cps. response. Switch selects 50 or 250 ohms output at —55 db. Tiltable head; chrome finish. 5/8"-27 thread. 18' cable, XL-3 connector. Size: 2" by 6 1/4". Net wt. 1 lb.



MODEL 630 POPULAR DYNAMIC

Famous for quality at low cost. 60 to 11,000 cps response. 50, 250 ohms, Hi-Z output (specify when ordering) at —55 db. On-Off switch; tiltable head; chrome finish. 18' cable, MC-3 connector; 5/8"-27 thread. Size: 2" by 6 1/4". Net wt. 1 lb.

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MODEL 605 DURABLE DYNAMIC
For dependable, general purpose use. Response 65 to 8,000 cps. 50, 250 ohms, Hi-Z (specify when ordering) at −55 db. Fixed head; chrome finish, 18′ cable with MC-1 connector. ⅝″-27 thread. Size: 3¼″ by 2″ dia. Net wt. 12 oz.

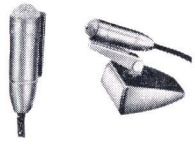


MODEL 611 MERCURY DYNAMIC
Traditionally styled, fine-performing dynamic for general sound pickup. Response 50 to 9000 cps. 50, 150, 250 ohms, Hi-Z output (specify when ordering) at −55 db. Tiltable head; On-Off switch; chrome finish. 18′ cable, MC-3 connector. ⅝″-27 thread. Size: 2⅜″ by 3⅛″ by 6¼″. Net wt. 1¼ lbs.

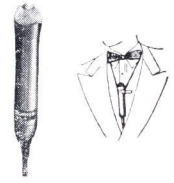


SPECIAL PURPOSE MICROPHONES

MODEL 649 MINIATURE LAVALIER
Smallest dynamic lavalier, weighs only 2 oz., 2$^{11}/_{16}$″ by ¾″ dia. Easily hidden in corsage, under lapel or tie, behind book—anywhere. Response 60 to 10,000 cps. 50, 150, and 250 ohms at −62 db. TV gray finish. Neck cord, clip, transformer housing at end of 30′ cable, UA-3 connector.
Model 449 stand. For Model 649 microphone.



MODEL 646 LAVALIER DYNAMIC
Extremely versatile—for chest, stand, boom, hand use. Variable control for rising or flat HF response. 50 to 10,000 cps. 50, 150, 250 ohms output (specify when ordering) at −57 db. TV gray finish. Neck cord, clip, 30′ cable, built-in connector. Size: 6¼″ by 1″ dia. Use Model 300 clamp (not included) for stand use. Net wt. 7 oz.



MODEL 210KK CARBON MICROPHONE
Lightweight, hand-held, extra rugged. Single-button carbon. Output −50 db. DPDT, Press-to-Talk switch can be used for relay control. Black phenolic case. 5′ coiled cord. Size: 2¼″ by 2¼″ by 4″.



MODEL 647 LAVALIER DYNAMIC
Small, rugged, versatile. For less exacting lavalier applications. Response 60 to 10kc, 150 ohms or Hi-Z (specify when ordering) at −57 db output. TV gray finish. Neck cord, clip, 18′ cable, built-in connector Size: 5″ by 1″ dia. Uses Model 300 clamp (not included) for stand use. Net weight 4 oz.
Model 416 Stand. Flush mount for Models 646, 647.



MODEL 648 INTERCOM DYNAMIC
Convenient talk-back and paging microphone. Mounts on desk or floor stand, boom, gooseneck, or special fixtures. Cable (not included) is concealed when used on Model 448 swivel boom. Response 50 to 10kc. 50, 150, 250 ohms output (specify when ordering) at −58 db. TV gray finish. Built-in connector. Size: 6$^{1}/_{16}$″ by 1″ dia. (with ⅝″-27 thread adapter). Net weight 8½ oz.

MODEL 448 SWIVEL BOOM MOUNT. Specifically for use with Model 648. Holds mike 11⅞″ off mtg. surface, extends 4″ below surface, 2½″ dia. mtg. base. 62° elbow bend. Chrome finish. MC-2 connector. Net wt. 1 lb., 5 oz.



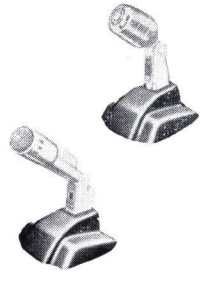
DESK STANDS

MODEL 418. Heavy die cast base, TV gray finish. For use with small-stud mikes such as Models 611, 623, 630, 635 and 636.

MODEL 418-S. Stand with on-off switch.

MODEL 419. Similar to Model 418 but for use with Models 654, 664, and 665.

MODEL 419-S. Stand with on-off switch.



MODEL 420. Heavy cast iron base, TV gray finish. With simple, positive finger-operated clamp. Mounts Models 666, 667, 655C, 646, other 1″ dia. mikes. Net wt. 3 lbs.



MODEL 423-A. Sturdy, smartly styled. Round die cast base, 5⅛″. dia., rubber base buttons. Chrome finish. Specify 3″ or 5″ stem riser. ⅝″-27 thread. Net wt. 1 lb.

MODEL 428 TOUCH-TO-TALK STAND. Lever-type switch for relay operation or mike on-off. SPDT or DPDT switch (specify when ordering). Closes, opens instantly or locks in "talk" position. Chrome finish, gray plastic switch lever. Size: 7″ by 5⅛″ base dia. Net wt. 1¾ lbs.



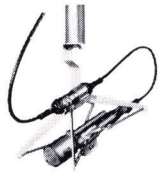
MICROPHONE ACCESSORIES

MODEL 345 SHOCK MOUNT. Dual-type, prevents reproduction of external shocks, vibrations. Easily attached, removed. Chrome finish. ⅝″-27 thread. Size: 3⅞″ by 1½″ dia. Net wt. 10 oz.



MODEL 346 SHOCK MOUNT. Similar to Model 345 but specifically for use with Model 666, other 11-oz. microphones. TV gray finish.

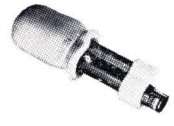
MODEL 366 BOOM SHOCK MOUNT. Extremely light suspension shock mount. Designed for use with 666, 667, 655C, other 1″ diameter microphones. No tools required for installation. Pigtail cable connection (UA-3 connectors) forms cable shock-isolation loop.



MODEL 300 MICROPHONE CLAMP. Lightweight adapter fits any 1″ dia. mike, provides positive stand mount; finger-operated nonslip clamp. ⅝″-27 thread, ½″ adapter.



MODEL 524 WIND SCREEN. Minimizes wind effects, boom or outdoor use. Made of Acoustifoam rubber. For use with Models 666, 667. Net wt. 2 oz.



MODEL 335 BLAST FILTER. Acoustically treated to stop wind, breath blasts without affecting frequency response. For Models 630, 635, 605. Chrome finish.



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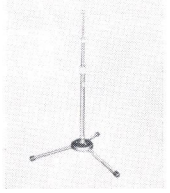
DR-330 MICROPHONE



Variable polar pattern, —57 dbm output and selectable 50, 150 or 250 ohm impedance, this microphone is considered one of the finest manufactured today. Pattern is true cardioid uni-directivity. May be changed to bi-directional ribbon or uni-directional dynamic. 40-15,000 cycle response. 6½" high with shock mounting, 2" diam. Weight, 20 ounces. Finish, gold and black. Supplied with 25' cable and Cannon XL3-12 plug.

Microphone less desk stand **DR-330**
Desk Stand ..... **ND**

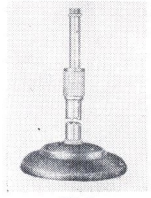
DEMOUNTABLE FLOOR STAND



A completely demountable floor stand for easy, light weight portability, yet unusually strong and sturdy. Adjusts from 26-64". Finish, chrome. 5/8" x 27 thread. Rubber cushioned feet. Weight, 4 lbs. Can be collapsed to length of 22½".

Demountable Stand **CS-33**

DESK STAND

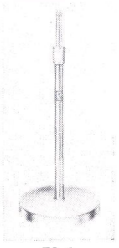


Adjustable 8" to 13", chrome stem and substantial cast base with felt feet. 5/8" x 27 thread.

Desk Stand ... **DS-7**

DS-7

BANQUET STAND

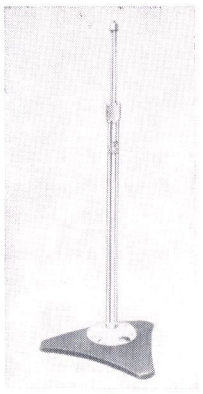


Adjustable 18" to 32", chrome stem and 8" diameter base. 5/8" x 27 thread. Full grip velvet action silent adjustment.

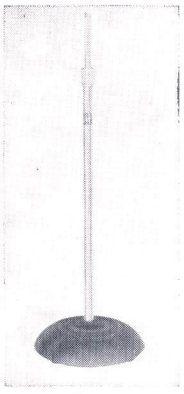
Banquet Stand **TS-6**

TS-6

FLOOR STANDS



MS-25



MS-10C

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

Microphone Floor Stand **MS-25**

Here is a good medium-priced floor stand with a 10" diameter base, chrome pipe and gray base. Adjustable to 64" with 5/8"x27 thread and non-slipping clutch. Weighs 9 lbs.

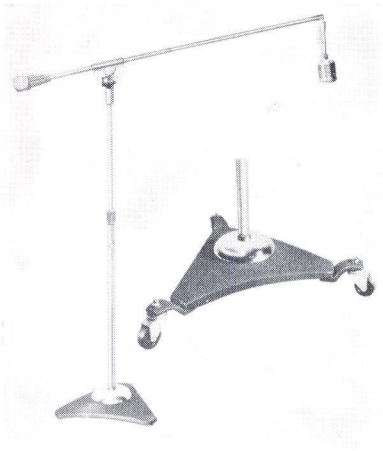
Microphone Floor Stand **MS-10C**

BOOM BRACKET

A boom bracket to attach to any existing floor stand with 5/8"x27 thread. 32" long, chrome plated. Counter balance adjustable for various microphones.

Boom Bracket **BB-1**

BOOM STANDS



New Model! All advantages of "Floating Action" and "safety Air-Lock Cushion" that prevents accidental slippage. All parts "Velvet Smooth" in operation. Boom easily removable to use upright as a conventional floor stand. Gyromatic swivel joint assures mike always hangs in proper position.

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

Boom Stand without casters **BS-36**
Boom Stand with silent casters **BS-36W**

ELECTRO-VOICE ENCLOSURES AND SPEAKERS



THE EMPIRE

Contemporary styling, functional design, and exceptional craftsmanship combine to provide an along-the-wall enclosure capable of superb musical reproduction. Accepts the speakers listed below. Available in mahogany, limed oak or walnut finish. Dimensions 29⅝" high, 32" wide. 16" deep. Shpg. wt. 56 lbs.



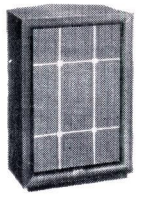
MODEL 15TRX

An excellent three-in-one speaker system for full-range reproduction. Response 30 to 19kc in Empire enclosure. Crossover points, 2kc and 3.5kc. 16 ohms impedance. Magnet wt. 5¾ lbs. Includes level control. 15⅛" dia., 9⅛" deep overall. Shpg. wt. 48 lbs.



MODEL 15TRXB

Economy version of three-way Model 15TRX. Response 30 to 18kc in Empire. 16 ohms impedance. Magnet wt. 1⅛ lbs. Includes level control. 15⅛" dia., 7⅝" deep overall. Shipping weight 17 lbs.



THE ARISTOCRAT

Unusually smooth reproduction from a modest size enclosure, when used with the speakers listed below. Specifically for room-corner placement. Crafted from the finest hardwood veneers; available in mahogany, limed oak or walnut finish. Dimensions 29⅝" high, 19" wide, 16$\frac{5}{16}$" deep. Shpg. wt. 44 lbs.



MODEL SP12

Clean, sparkling reproduction is provided by this efficient 12" coaxial speaker. Response 30 to 13kc in Aristocrat enclosure. 16 ohms impedance. 3-lb. magnet. 12¼" dia., 7½" deep overall. Shpg. wt. 25 lbs.



MODEL SP12B

Economy version of Model SP12. Response 30 to 13kc in Aristocrat. 16 ohms impedance. 1-lb. magnet. 12¼" dia., 6" deep overall. Shipping weight 12 lbs.



MODEL 848

Rugged, wide-range coaxial projector, for voice and musicasting. Coaxial performance in a weatherproof, blastproof fibreglass horn assembly. Response 200 to 10kc with wide-angle dispersion. 16 ohms impedance. 10½" wide, 20½" high, 20" deep. Shpg. wt. 17 lbs.



MODEL 847

Compact and efficient, similar to Model 848 in operation but for low-level applications. Response 300 to 10kc. 16 ohms impedance. 11¾" wide, 7¾" high, 10" deep. Shpg. wt. 7 lbs.



THE BARONET

An excellent enclosure where space is limited. For room-corner placement on the floor or hang from the ceiling. Wide-range reproduction is assured using the Model SP8B listed below. Available in mahogany, limed oak or walnut finish. 22⅞" high, 14½" wide, 13¾" deep. Shpg. wt. 20 lbs.



MODEL SP8B

The perfect complement for the Baronet enclosure. Smooth peak-free response from 35 to 13kc. 16 ohms impedance. 1-lb. magnet. 8⅜" dia., 4⅜" deep overall. Shpg. wt. 9 lbs.

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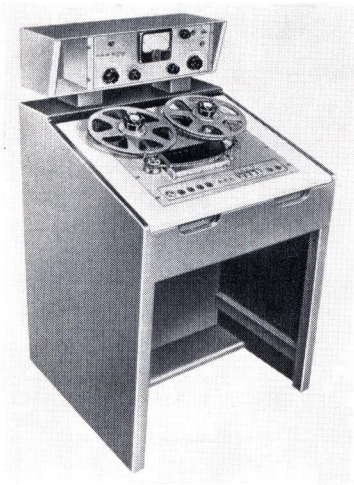


Fig. 1: Console model is functionally correct, commercially styled and easy to service. Note foot room not usually found on tape recorders.

NEW PRESTO 800 PROFESSIONAL TAPE RECORDER

Designed by a world leader in recording equipment, the new Series 800 tape recorders are thought by many to be the finest made today. Close cooperation with professional recordists resulted in many mechanical and electrical features that are innovations. — Here is a recorder used as the master in phonograph record recording or the type major broadcasting studios and networks will rely on. The 800 can be depended upon to maintain original adherence to highest specifications almost indefinitely.

TRANSPORT FEATURES

3 Motors (Direct-Drive Hysteresis Synchronous Capstan Motor and Two Torque Motors).

10½" reel capacity.

Solenoid operated brakes and pressure pulley. Entirely new brake design eliminates frequent readjustment.

Individually and functionally illuminated pushbutton relay controls.

Provision for remote control.

Exclusive tape edit button allows easy "run-off" of unwanted tape.

Cue button allows hand cueing without motor or brakes.

Automatic tape lift; only head(s) in use are contacted by tape.

Easy "Sweep" tape loading.

Unique e-z-off self-locking combination reel retainers and editing knobs.

Three-speed ranges of rewind and fast forward.

Two reel-size switches for perfect running torque control.

Removable unitized head assembly with self-contained adjustments.

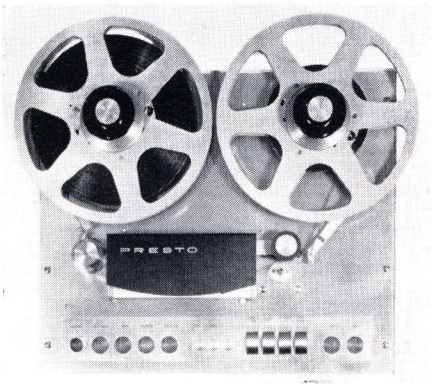


Fig. 2: Tape transport mechanism is a masterpiece of accurate machining and fine workmanship. Exclusive tape edit button permits easy "run-off" of unwanted tape.

PREAMPLIFIER

Input can be switched to 600 ohm line, bridging or microphone input.

Illuminated VU meter reads recording, playback, bias or erase levels.

Two separate output circuits for maximum versatility:

1. Cueing output switched with VU meter has separate independent level control. Sufficient output to drive small loudspeaker and/or earphones.
2. Monitor output has input-output comparison switch.

Any number of amplifiers can be interlocked for multi-channel operation by use of accessory cable.

No clicks when starting or stopping recording under any conditions.

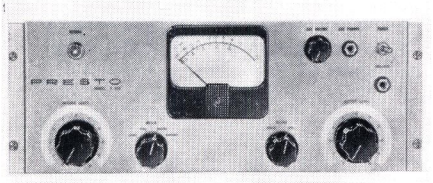


Fig. 3: The amplifier has dual output circuits. Monitoring amplifier has input-output comparison switch. There are no clicks or pops when starting or stopping recordings.

SPECIFICATIONS

SPEEDS: 7.5 and 15 ips (Equalization automatically switched with speed change).

SPEED REGULATION (wow and flutter): No more than .10% at 15 ips or .15% at 7.5 ips.

SIGNAL-TO-NOISE RATIO: 60 db at 1.0% distortion.

PLAYBACK AMPLIFIER DISTORTION: 1% (harmonic) at plus 20 dbm output from 35 to 15,000 cps.

FREQUENCY RESPONSE: 30-20,000 cps ±2 db at 15 ips.

HEADS: Accommodates up to four full or ½ track ("Stacked" Stereo optional).

TRANSPORT PANEL SIZE: 19"x15¼".

PRE-AMPLIFIER SIZE: 19"x7½".

SEPARATE POWER SUPPLY PANEL SIZE: 19"x3½".

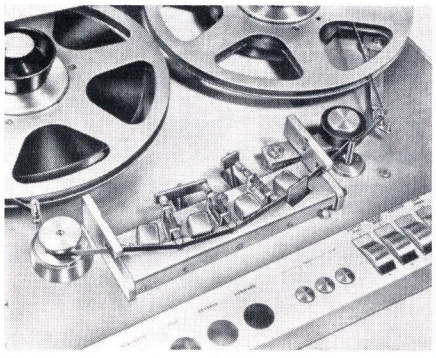


Fig. 4: The precision alignment of the multiple heads and simplicity of threading is exemplified in this illustration. Many of the long existing demands of professional recordists have been supplied in the 800 Series recorders.

ORDERING INFORMATION

(Full Track)

Console model complete (Fig. 1)	C800-1
Rack model complete (Fig. 2 and 3)	R800-1
Portable model (2 cases not illustrated)	P800-1

Available half track, stereo and other combinations as desired.

RECORDING TAPE

(Minnesota Mining & Mfg. Co.)





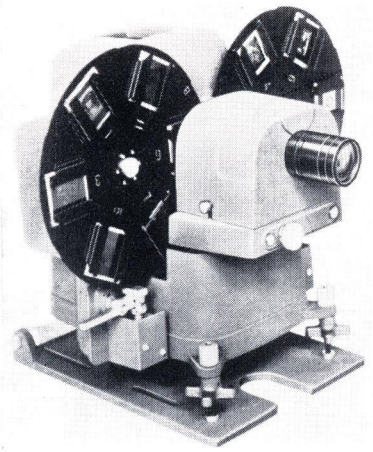
Recording tape is carried in generous quantity at all Gates stock carrying points. Rapid turnover assures fresh stock at all times. Recording tape is prepaid to any place in the United States and quantity prices are lower (see price list). Unless otherwise stated, all tape is of Minnesota Mining manufacture.

Size	Cat. No.
Type 111 plastic base, red oxide coating:	
¼"x 150' plastic 3" reel	111-1.5
¼"x 300' plastic 4" reel	111-3
¼"x 600' plastic 5" reel	111-6
¼"x1200' plastic 7" reel	111-12
¼"x2400' on hub	111-24H
¼"x2400' on 10½" metal reel	111-24R
¼"x4800' on hub	111-48H
¼"x4800' on 14" metal reel	111-48R
Type 120 high output plastic base, green coded:	
¼"x 600' plastic 5" reel	120A-6
¼"x1200' plastic 7" reel	120A-12
Type 190 new thin type, 50% more recording time per reel:	
¼"x 900' plastic 5" reel	190-9
¼"x1800' plastic 7" reel	190-18
¼"x3600' NARTB 10½" metal reel	190-36R
¼"x3600' on hub	190-36H
¼"x7200' on 14" metal reel	190-72R
¼"x7200' on hub	190-72H
Type 150 weather balanced extra play:	
¼"x 900' on 5" plastic reel	150-9
¼"x1800' on 7" plastic reel	150-18
¼"x3600' on hub	150-36H
¼"x3600' on 10½" metal reel	150-36R
¼"x7200' on hub	150-72H
¼"x7200' on 14" metal reel	150-72R
New 200 double play tape:	
¼"x2400' on 7" reel	200-24
¼"x4800' on 10½" NARTB metal reel	200-48R
Special tapes:	
Splicing tape ½"x150'	41-½S
Leader timing tape, ¼"x150'	43-1.5
Head alignment tape 15" sec.	200
Head alignment tape 7½" sec.	GR-LST
Empty reels with mailing cartons:	
3" empty reel	RB-3
4" empty reel	RB-4
5" empty reel	RB-5
7" empty reel	RB-7
10½" empty metal reel	RB-10-½M

Quantity prices shown on price list— all tape prepaid anywhere in U. S. A.

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MODEL 3B TELOJECTOR



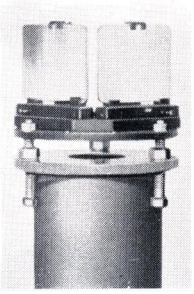
Accommodates twelve 2"x2" transparencies in an uninterrupted slide sequence of TV commercials, news photographs and station breaks. — Is automatic. Additional loaded turrets may be substituted in seconds. Features new optical mixing system. Superposes two images on one optical axis permitting smooth lap dissolves or instant switching. Designed for use with vidicon multiplexer. Iconoscope may also be used. Supplied with 6" or 7" coated lens as ordered. — For 115V, 60 cycles. Control circuit operates from 24 volts DC, 10 watts. — May be used with 35B manual control unit to produce superpositions, laps, fades and slide changes at desired rate and local/remote slide changes.

ORDERING INFORMATION

Telojector, lens, automatic timer box and 2 slide turrets	**Model 3B**
Manual control unit	**Model 35B**
Additional turrets, 31L or 31R (L indicates left, R right)	**31L-31R**
Mounting shelf, for mounting Telojector to Gray multiplexers	**Model 63A**

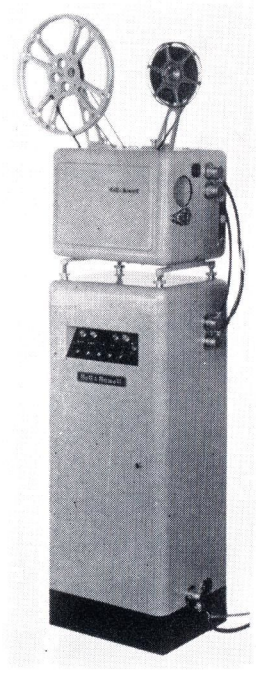
62A TWO-WAY FIXED MIRROR MULTIPLEXER

Handles two film projectors into single camera. By use of 63A mounting shelf, the 3B Telojector can also be used. Height, optical center to floor, 48". With this system slides and film are handled with one set-up.



Multiplexer and Base 62A

BELL AND HOWELL TV PROJECTOR



BELL & HOWELL "614 JAN" is a new TV projector for 16 mm designed for use with vidicon film chains and having an important exclusive feature of being able to play back magnetic sound tracks as well as the normal optical sound track. Originally designed for the Army to JAN Specs, is self-evidence of ruggedness. Design eliminates need for synchronizing pull down with sync generator. Light output is 50 lumens with a 300W, 25 hour lamp. — All functions "On", "Off", "Show", "Forward" or "Reverse" may be remotely operated, if desired.

SPECIFICATIONS

REEL CAPACITY: 2000'.

SOUND: Optical and magnetic.

LOOP SETTER: Push-button.

SHUTTER: 120 cycles per second.

LENS: 2" f/1.6 (up to 5.4 where desired).

DISTORTION: 2% or less, 100-7000 cps.

RESPONSE: 80-8000 cps ±1½ db.

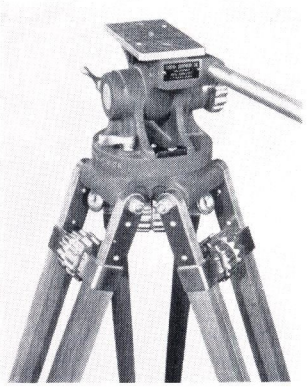
FLUTTER: 0.25% or less.

POWER: 105-129 volts, 50/60 cycles.

SIZE: (with pedestal) 51¾" high, 12 1/8" wide, 16¼" long. Lens to floor: 48" ±1".

Projector complete with pedestal 614CBVM

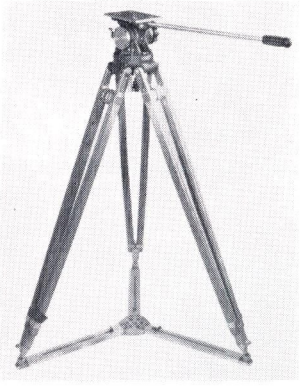
CAMERA TRIPODS



SPRING HEAD TRIPOD

This model ideal for vidicon cameras weighing up to 25 lbs. Constructed with spring load tilt which assures camera returning to neutral position when lever is in unlocked position. Range, 44½" low to 73" high. Built-in spirit level. Model B triangle is optional base unit to keep legs from spreading and marring floors.

Professional Jr. spring head tripod	**GR-973**
Model B triangle	**GR-974**



FRICTION HEAD TRIPOD

For vidicon or cameras 25 pounds or less. Equipped with friction type pan and tilt head, with tilt tension adjustment and pan and tilt lock levers. Equipped with spirit level. Range, 44½" low to 73" high. Legs of sturdy maple with quick positive locking devices.

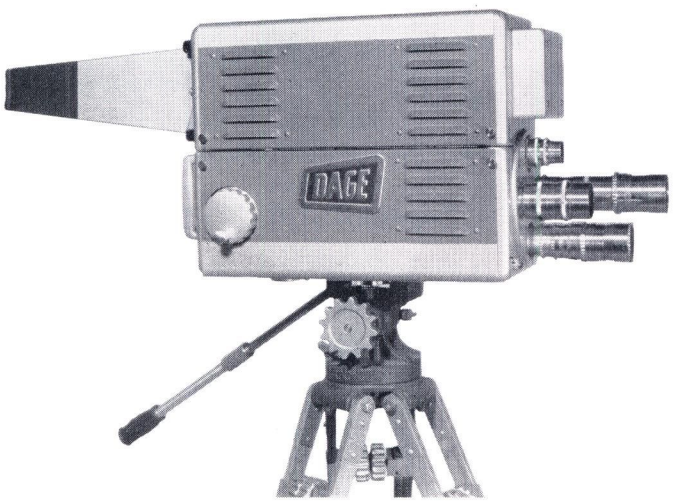
Professional Jr. friction head tripod	**GR-975**
Carrying case for outside use	**GR-976**

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GATES

DAGE TELEVISION EQUIPMENT

Gates is exclusive world-wide distributor, except Canada, for Dage professional television cameras, film chains, switchers, monitors, synchronous generators and other Dage products for television broadcasting stations. Both sales and service of Dage monochrome and color equipment is handled exclusively through the Gates sales and engineering departments.



MODEL 320-A STUDIO CAMERA

A precision studio production camera, built to operate long hours with only minimum maintenance. Equipped with four lens turret and electronic viewfinder. Lenses may be quickly interchanged from the operator's position. Focusing is smooth, with no backlash. A four unit chassis is hinge mounted, to swing out, the amplifier strips are plug-in, hinge secured and all components are readily accessible. As a camera for film operation, the Model 320-F is identical to the 320-A other than a single lens is provided and the viewfinder is omitted. (See Page 234.)

Features:

- Adjustable dynamic focus.
- Variable aperture correction.
- Overscan switch.
- Camera linearity independent of drive pulse widths.
- Local-remote switch for electrical focus.
- Anti-backlash, planetary drive optical focus.
- Rear lens turret control, positive indexing type.
- All tubes, controls and components easily accessible without use of tools.
- Unfolds for ease in servicing. Plug-in (hinge secured) amplifier strips.
- Detachable viewfinder. Camera will operate without readjustment with viewfinder removed.
- Viewfinder circuits adjustable independent of camera circuits.
- Adjustable peaking coils.

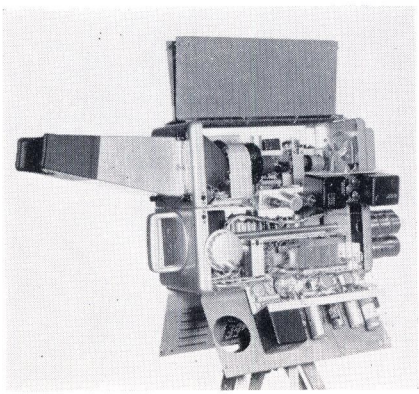
SPECIFICATIONS

OUTPUT: Picture signal (negative black), 0.25 volt (p-p) (nominal).
FREQUENCY RESPONSE: 8 mc ±1 db.
IMPEDANCE: 51.5 ohms.
LIGHT REQUIREMENTS: (for quality), 100-150 ft. candles.
NOISE-FREE PICTURE: (average scene) with f:1.5 lens stop, incident illumination.
SPECTRAL RESPONSE: (with 6326 Vidicon), approx. same as human eye.
LENSES: 16mm "C" mount. Turret provision for 4 lenses.
VIEWFINDER: Electronic 5" with 5AYP4 tube. Magnetic deflection, electrostatic focus.
MECHANICAL: (case dimensions), 11 3/16" high, 7¼" wide and 17¾" long. Finish, blue and silver lustre baked enamel. Weight, with viewfinder, 30 lbs. Mounting, ¼" x 20 tapped for standard tripod screw.

ORDERING INFORMATION

Studio camera complete with viewfinder, 4 lens turret, vidicon tube but less lenses* **320-A**
Film camera less viewfinder and less lens* and with vidicon tube **320-F**

* Lenses and complete studio or film chains are listed both separately and complete in the price list accompanying this catalog.



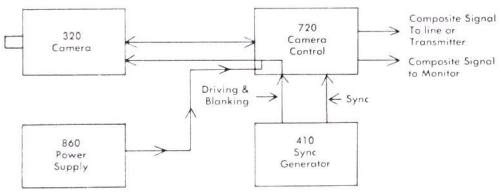
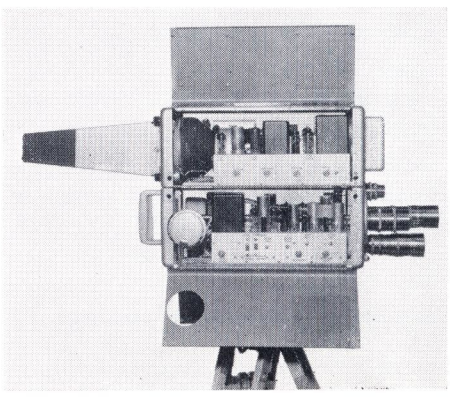


FIG. 1-1

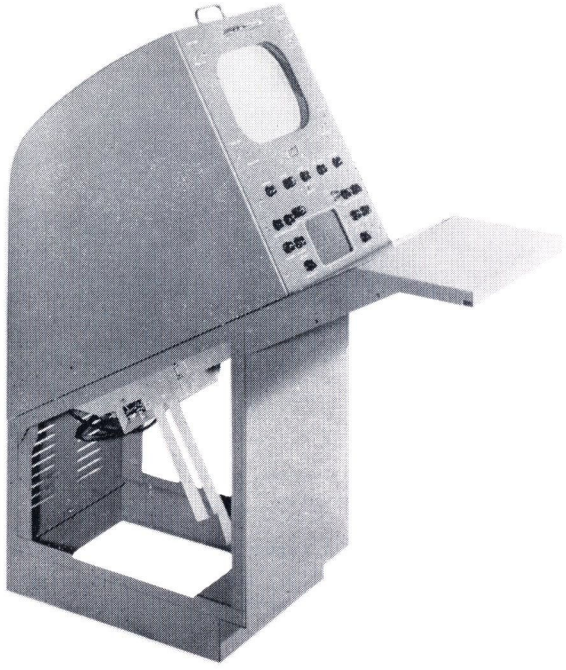
MINIMUM NUMBER OF UNITS COMPRISING A SINGLE CAMERA CHAIN



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GATES

DAGE CAMERA CONTROL



Provides control over electrical focus of camera target, beam and video gain. Camera picture is displayed on high quality video monitor. Oscilloscope permits waveform monitoring at either horizontal or vertical rates. Control of blanking level of composite picture signal, provision for internal insertion of sync to picture, with sync height adjustment, is included for installation using only one camera with no switching of signal sources. Interlaced pulse cross display is available from composite signals.

Features 720-A . . .

- — Target current calibration circuit.
- — Adjustable peaking coils.
- — Regulated high voltage for picture tube. Amplified blanking at both horizontal and vertical rates.
- — Monitor high voltage circuits independent of deflection.
- — All monitor adjustments on front panel.

SPECIFICATIONS

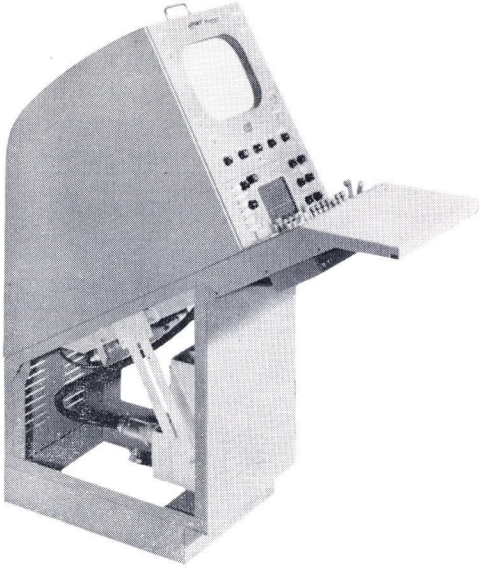
INPUT: Horizontal driving pulse (negative): 3-5 volts (p-p).
Vertical driving pulse (negative): 3-5 volts (p-p).
Blanking (negative): 3-5 volts (p-p).
Picture signal (negative black): 0.25 volt (nominal) (p-p).
Impedance: 51.5 ohms.
Power required: 280 volts DC at 600 ma and 117 volts AC 60 cycles, or Model 860 power supply listed following page.

OUTPUT: Picture signal (negative black): video 1.0 volts (p-p). Composite 1.4 volts (p-p). Adjustable sync level.
Frequency response: 8 mc ±1 db.
Impedance: 75 ohms.

OPTICAL: Picture monitor: 10" picture tube, Type 10FP4A.
Waveform monitor: 5" CRO, flat face, electrostatic deflection, Type 5ABP1. Illuminated graticule. RETMA calibration.

Camera Control Unit, with tubes **720-A**

DAGE 635-A MASTER MONITOR



This precision master monitor incorporates interlaced pulse cross display and a regulated Kinescope high voltage supply. The picture size remains constant regardless of brightness setting. Illuminated 5" "A" Scope calibrated graticule provides accurate measuring of video levels from any of six video sources selected by push-button.

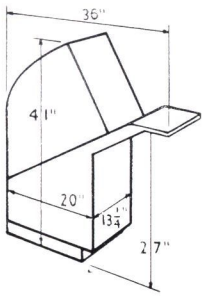
Features 635-A . . .

- — Amplified blanking both horizontal and vertical.
- — Picture tube HV circuit independent of deflection.
- — All operating adjustments front panel.
- — Dustproof picture tube screen enclosure.
- — Uses either composite signal, drive pulses or sync pulses for deflection as selected by relay operated from "A" Scope selector switch for signal selection.
- — Interlaced pulse cross display by front panel switch selection.

SPECIFICATIONS

ELECTRICAL		Picture Monitor	(Waveform Monitor)
Input:	AC line voltage	117 volts ±10% at 80 watts.	117 volts ±10% at 40 watts.
	DC regulated	280 volts at 305 ma.	280 volts at 100 ma (approx.).
Video (Non-composite)	Black negative	0.15 volt p-p minimum. 1.0 volt p-p nominal.	1.0 volt p-p nominal.
Video (Composite)	Black negative	0.2 volt p-p minimum. 1.4 volts p-p nominal	1.4 volts p-p nominal.
	Impedance	2500 ohms (Bridging, or terminated in 75 ohms).	360K (Bridging, or terminated in 75 ohms).
H and V drive pulses	(negative)	0.4 volt p-p minimum. 3-5 volts p-p nominal.	3-5 volts p-p.
OR	Sync (negative)	0.4 volt p-p minimum. 3-5 volts p-p nominal.	3-5 volts p-p.
	Video connector	BNC Type UG 625/U	BNC Type UG 625/U.
Number of video inputs		One, as selected by six-position selector switch on "A" Scope.	Total six. Automatic sync insertion for pix monitor on non-composite signal.
	Picture tube	Type 10FP4-A	
	CRO		Type 5ABP1.
Frequency response		8 MC ±2 db.	IRE Roll off.

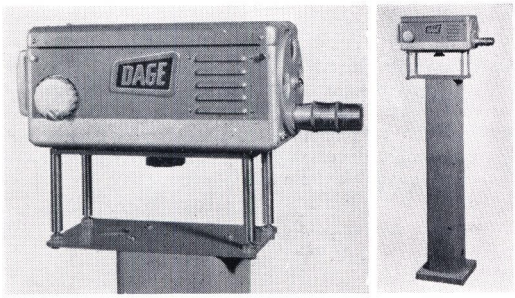
Master Monitor/Waveform Monitor, with tubes **635-A**



Dimensional drawing of 720-A camera control unit and 635-A master monitor.

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FILM CAMERA — PEDESTAL



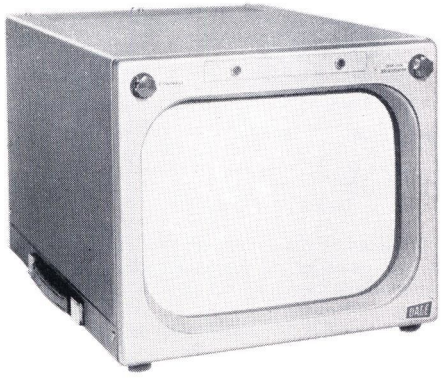
Pictured above is the Dage 320-F vidicon film camera. This model is identical to the 320-A listed on Page 232 with viewfinder and lens turret removed. Full specifications are listed on Page 232.

Film Camera, less lens **320-F**

Pedestal as illustrated above, allows proper camera mounting with adjustments for dual projector, slide projector and multiplexer installation. So designed that camera may be quickly removed for other service or 320-A studio camera may be quickly attached in case the studio camera is employed for both live and film pickup.

Pedestal complete **C-080**

VIDEO MONITOR



For broadcast monitoring for medium or wide bandwith (optional) with high gain, regulated high voltage for picture stability and freedom from size variation. Has rugged metal cabinet with handles if portability is needed. Monitor may be stacked in multiple and is also available rack mount.

SPECIFICATIONS

Video input (black negative polarity):
0.1 volt (p-p) minimum.
4.0 volts (p-p) maximum.

Sync input (when used) negative:
0.1 volt (p-p) minimum.
4.0 volts (p-p) maximum.

Contrast Control Range: 30 db minimum.

Input Impedance: Hi-impedance bridging. May be terminated.

Input Connector: BNC, Type UG-290/U.

Kinescope: 14QP4 or 14QP4A.

Frequency Response: ±3 db to 8.0 mc wide-band.
±3 db to 4.0 mc narrow-band.

Video Gain: 47 db ±3 db wide-band.
57 db ±3 db narrow-band.

Line Voltage: 117 ±7 volts, 50-60 cycles.

Power Consumption: 175 watts.

Size: (cabinet model) 12" high, 15" wide, 19½" deep.
(rack model) 14" high, 19" wide, 8" deep.

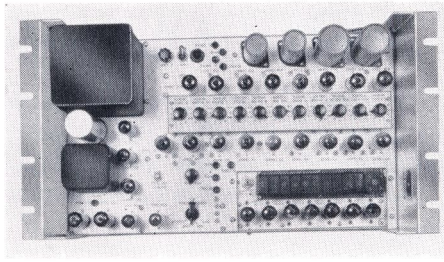
Weight: 53 lbs.

Finish: Blue-gray baked enamel cabinet, silver lustre front.

Video Monitor **602-A**

LENSES

As lenses are of various focal lengths, a complete listing will be found in the price list with this catalog. — The usual focal length lens for film pickup is 3" f/2.5. For a 4-lens turret in the studio camera, Page 232, a 1" f/1.5, a 2" f/1.9, a 3" f/2.5 and a 4" f/4.5 provides an excellent quartet for a wide range of studio and outside pickup.



SYNCHRONOUS GENERATOR

A new sync generator for monochrome or color. Uses new magnetic binary counter circuits to offer stable frequency division requiring no adjustment. Pulse widths in pulse shaper unit to meet RETMA and FCC specifications. Complete with electronically regulated power supply. Available in rack or portable case model.

SPECIFICATIONS

Line phasing adjustment available, not less than 60 degrees. Electronically regulated power supply.

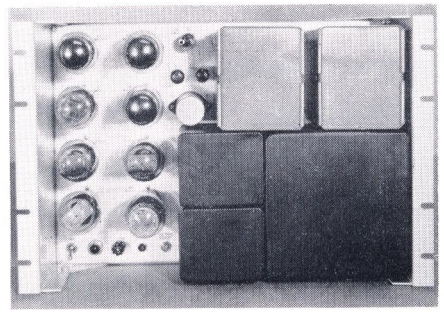
Input: AC power, 115 volts, 60 cycles ..... 150 watts

Output:	**Frequency:**	**Peak to peak volts, (across 75 ohms) +0, —1 volt**
Horizontal Driving:	15,750	5 volts
Vertical Driving:	60	5 volts
Blanking:	60 and 15,750	5 volts
Synchronizing, composite:	60 and 15,750	5 volts

Test: Provision for measurement of AFC voltage available from front panel test jacks. Master oscillator, binary divider output signals and waveforms available from front panel test jacks.

Size: (rack model) 10½" high, 19" wide, 7½" deep.

Synchronous Generator with tubes **410-A**



Model 860

90-130 volts 60 cycle single phase AC at 450 watts (approx.) Fuse, 10 amp., 3AG.
Regulated +250 to +300 volts DC (adjustable) at maximum of 800 ma.
Unregulated +360 volts (approx.). Current output such that total of 800 ma is not exceeded from regulated and unregulated totals.
Size: 12¼" high, 19" wide, 8¼" deep.

POWER SUPPLIES

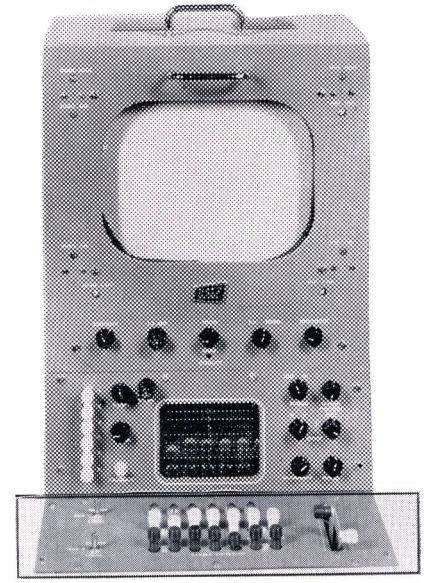
Three models fit needs of Dage cameras and other Dage units requiring external power supplies. Ultra conservative design assures long, trouble-free operation.

Model 850

90-130 volts AC, 60 cycle. Supply fused at 5 amps.
Regulated +250 to +300 volts (approx.) at maximum of 400 ma.
Unregulated +360 volts (approx.).
Negative centering supply.
Size: 6¾" high, 19" wide, 8¼" deep.

Model 840

90-130 volts AC, 60 cycle. Supply fused at 2 amps.
Regulated —150 volts at maximum of 200 ma.
Size: 3½" high, 19" wide, 8¼" deep.



Above, the 520 Switcher-Fader control panel mounted under the 635-A master monitor. Tally light indicates which signal on air. Has sync interlock provisions for stabilizing amplifier control, back-porch line-to-line clamper, adjustable sync amplitude, program and intercom sound provision and external tally lights for all input positions.

SWITCHER AND FADER

Six incoming video sources, two of which may be composite signals, includes smooth action fading and accurate control of video programming functions. Usually mounted in sloping portion of the 635-A master monitor (see Page 235) with switcher amplifier (not illustrated) mounted in lower section of the 635-A master monitor.

SPECIFICATIONS

Input:

Picture signal (negative black): 1 volt (p-p) video, or 1.4 volts (p-p) composite.

Sync (negative): 3-5 volts p-p.

Impedance: 75 ohms.

Power required: +280 volts (regulated) at 200 ma (approx.) 117 volts ±10 volts for intercom circuit and filaments.

Number of signal inputs: Six. (Two inputs for composite signals).

Output:

Picture signal (negative black): 1.4 volts (p-p) composite. Adjustable sync level. Video channel gain-balance controls.

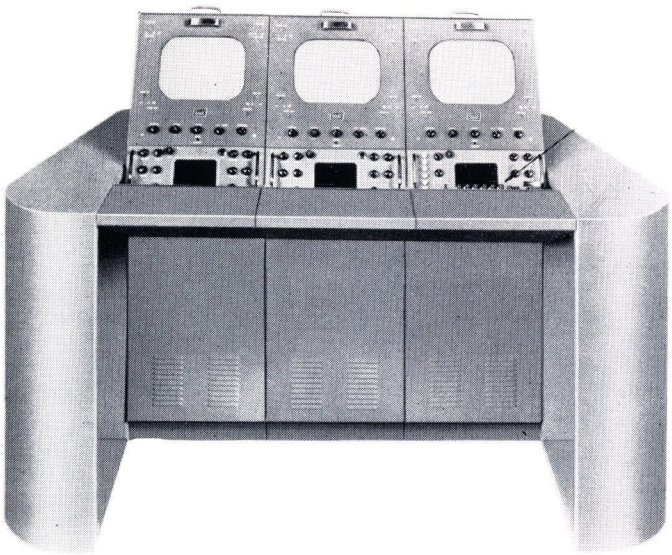
Impedance: 75 ohms.

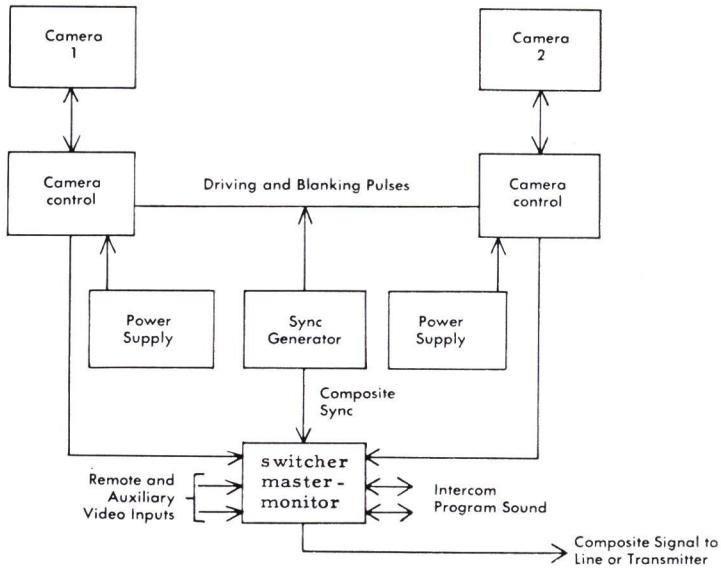
Isolated Monitor signal (negative black): 1.4 volts (p-p) in 75 ohms.

Size: (Switcher) 3¾" high, 13" wide, 5¼" deep.
(Fader) 9¾" high, 11¾" wide, 7¼" deep.

Switcher-Fader, includes amplifier **520**

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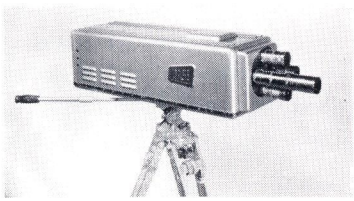
ABOVE is illustrated the complete video control center for dual camera control, switcher-fader and master monitor. Camera control units may be used for dual camera chain such as one studio camera and one film camera. For additional cameras it is only necessary to add the 720 camera control, widening the above control unit by the width of one 720-A console. Schematic diagram illustrates the basic console arrangement. Synchronous generator and power supplies would be rack mounted. — With the above equipment, associate cameras, projectors and audio equipment listed elsewhere in this catalog, the basic equipment is ready to attach to a Gates television transmitter or other makes.

VIDEO ACCESSORIES

Each installation will require certain accessories such as camera, power, pulse, sync and intercom cables along with lens, camera dollies, multiplexers for projector to film camera pickup and other necessary but not major components. To avoid unnecessary listing and confusion, these items are listed in the price list accompanying this catalog. — Gates engineers will gladly provide complete package listings or advice relative to any need that might be in question.

DAGE CAMERAS FOR COLOR

A complete line of color studio cameras, film cameras, camera controls, monitors, switchers and all necessary equipment for broadcasting in color is now ready for the progressive TV broadcaster. Listed below are several typical units. Gates will gladly quote portions or complete packages on request.



Above, the new Dage color studio camera with four lens turret. Camera employs three-vidicon system. Accessories available include control consoles, monitors, color sync generators, masking amplifiers, gamma modification amplifiers, matrixing and encoding equipment. — Dage color cameras are already in use at various locations in the United States and may be seen in use at the courtesy of the user.

FIG. 1. Dage 750-A color film camera control console. A newly developed cathode follower blanking clipper circuit insures constant reference black level under severe scenic changes.

FIG. 2: The 360-A Dage color film TV camera-multiplexer. The 3-vidicon color system and inclusion of multiplexer permits operation of films and slides of varying density without objectionable picture noise.

FIG. 3: Assemblage of accessories for color operation is usually in one standard rack of equipment as illustrated. Gates engineers will gladly consult with any prospective user of color to plan the installation.

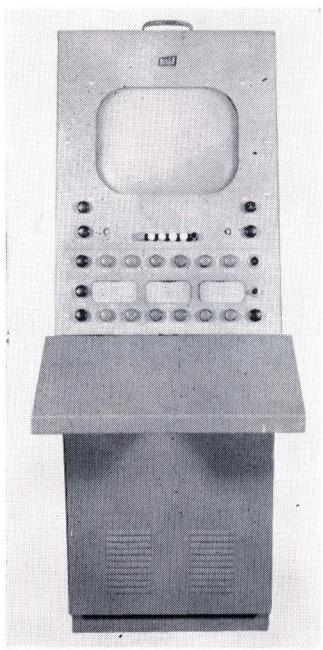


Fig. 1

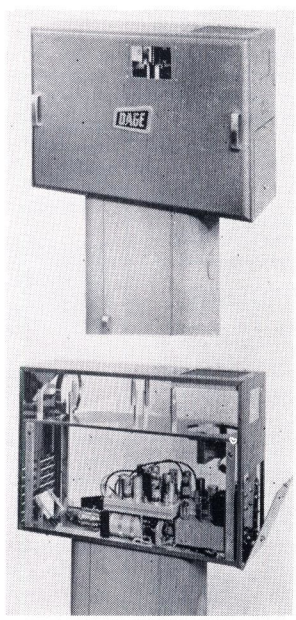


Fig. 2

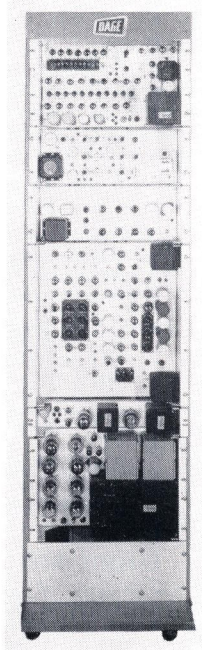
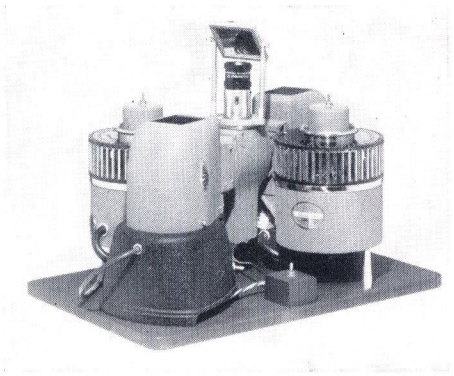


Fig. 3

If You Didn't Get This From My Site,
Then It Was Stolen From...
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TV TWIN SELECTROSLIDES



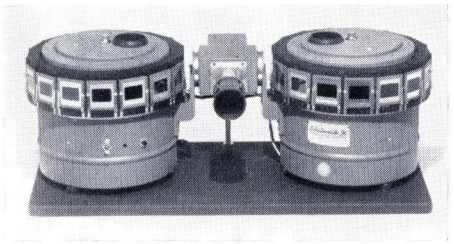
—Holds 96 slides, 48 in each magazine. Slides insert in steel holders for accurate focus. Each Selectroslide operates independently of the other by remote control and is vibration-free.

—Two solenoids actuate twin front silvered mirrors. Change time is approximately 1/50 second. Aspheric condensing system assures even illumination over 100% picture area. Lamp capacity 100 to 750 watts.

—Lenses 7" to 11" are available. Excellent for color or black and white. Size: base 24" x 16", height 13".

TV Twin Selectroslide, less lens ..... Cat. 340A

TWIN SELECTROSLIDE JUNIOR



—Holds 32 slides, 16 in each magazine. Four registering pins for each slide for perfect alignment. Each turret operates independently of the other by local or remote control. For rechecking, turret may be rotated by hand.

—Two solenoids actuate twin front silvered mirrors. Change time 1/50 second. Aspheric condensing system assures even illumination over 100% picture area. Lamp capacity 50-300 watts. 150 watts usually used.

—Lenses 7" to 11" are available. Excellent for color or black and white.

Twin Selectroslide Junior, less lens 330A

Twin Selectroslide Junior with 4 slide preview to illuminate next 4 slides to be used 330B

SINGLE TURRET SELECTROSLIDE

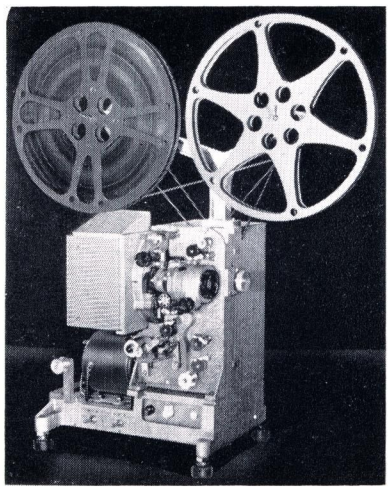
Quite similar in specifications to Twin Junior above, only has single turret to hold 16 slides. Turret can be shifted by pressing a button on side or remote operation is also possible. Lenses from 5" to 11" may be used. Should be used with lens support for lenses 7" or larger.

Single Selectroslide, less lens 322A
Lens support 349
Single Selectroslide with 4 slide previewing 322B

LENSES FOR SELECTROSLIDES

5" lens in special TV focusing mount 343
7" lens in special TV focusing mount 344
7½" lens in special TV focusing mount 344A
9" lens in special TV focusing mount 345
11" lens in special TV focusing mount 348

HOLMES ITP PROJECTOR



A fine, modest cost TV projector with provision for remote control. High speed rewind (2000' in 2 minutes). Powered by 1/20 HP synchronous ball bearing motor. Has complete tilting and leveling facility, forced ventilation, three-stage preamplifier and uses a 500 watt pre-focus base projection lamp. Available with or without base.

SPECIFICATIONS

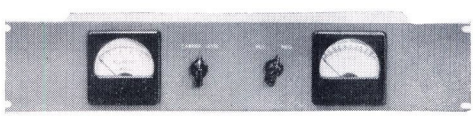
Projector and Amplifier: 107 to 127 volts, 60 cycle, single phase AC, 650 watts.
Projection Lamp: 500 watt, T-10, medium prefocus, 115 volt, C13D filament.
Exciter Lamp: 0.75 ampere, 4 volt, T-5, single contact, prefocus base, C-8 construction.
Photocell: Type 927.
Power Output: +2 VU at 1000 cycles.
Hum and Noise Level: —50 db below output.
Distortion: 1% at output level.
Gain: 60 db at 1000 cycles.
Input Impedance: 500,000 ohms.
Output Impedance: 500/600 ohms.
Voltage Amplifier: 5879.
Output: 5751.
Oscillator: 50C5.
Fuse: 2 ampere.
Projection Lens Height: 13½" ±½".
Film Capacity: 2000 feet.
Film Speed: 24 frames per second.
Shutter Speed: 720 RPM, 60 exposures per second.
Motor: Synchronous, 1/20 HP, single phase, 60 cycle, 1800 RPM.
Size: Width, 10", length, 15½", height, 17½", weight, 50 lbs.

ORDERING INFORMATION

Projector with 2" focus f/1.6 lens, 500 watt lamp, tubes, feed and take-up reels ..... ITP

ACCESSORIES:
Remote control unit complete GR-51
Three point floor pedestal with top GR-52
Spare exciter lamp, 4 volt, .75 ampere GR-53
Spare 500 watt projection bulb GR-54
Spare preamplifier tube kit GR-55

TUBELESS MODULATION MONITOR



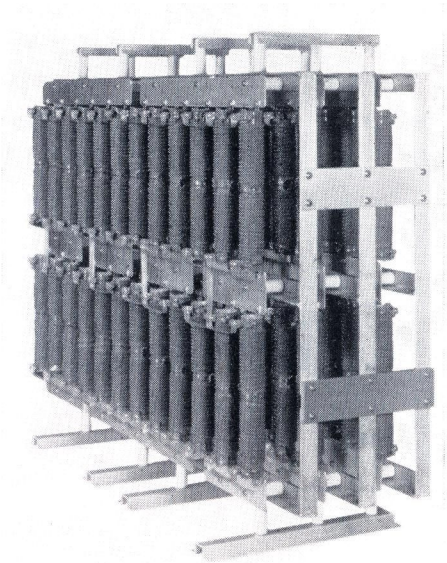
For reading modulation percentage in communications AM operated transmitters. Uses germanium rectifiers in place of tubes. Carrier level and modulation percentage meters are 3" square case. For radio broadcasting service the MO-2639 monitor on Page 87 should be used.

SPECIFICATIONS

MODULATION INDICATION: Reads 0-110% modulation and in decibels.
ACCURACY: 2% at 100% modulation and 5% midscale.
FREQUENCY RESPONSE: Within 2 db 50-10,000 cycles.
INPUT: Requires about ¼ watt. Input voltage 20V at 1000 kc or less. Input capacity 15 mmfd.
RF RANGE: 2 to 30 mc.

Modulation monitor complete ..... Cat. M-3737

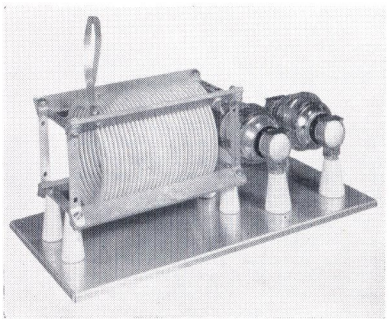
50KW AIR COOLED DUMMY ANTENNA



To eliminate water cooling at higher powers, Gates has developed this new air cooled unit for use between 540 and 2000 Kc. Unit pictured above illustrates the grouping of resistance elements and an aluminum frame. This frame is then installed in a forced air chamber, usually a metal duct with proper size blower attached at one end. In 50KW transmitters with external blower, such as the Gates BC-50B transmitter, the dummy antenna may be mounted in the air duct itself.

As dummy antennas are required in various resistances and loading requirements, this product, though readily available, is carried as a custom item. Gates will quote promptly on receipt of (a) resistance or impedance, (b) distance of dummy antenna from transmitter output, (c) frequency of operation, and (d) cooling facilities, if any.

A power rating of 75KW permits 100% modulation of 50KW transmitters under proper cooling conditions.



The above tuning unit is provided with the 50KW dummy antenna to assure a perfect non-reactance load. This consists of a standard tapped edgewise coil and vacuum capacitor assembly.

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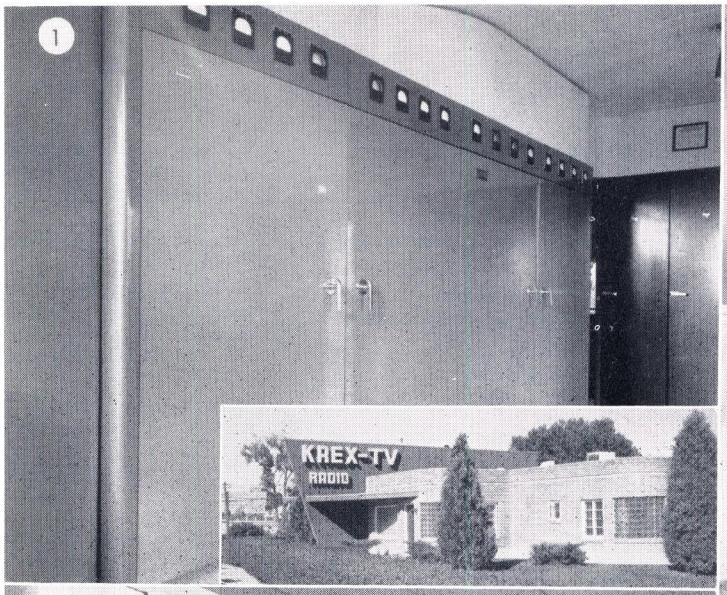
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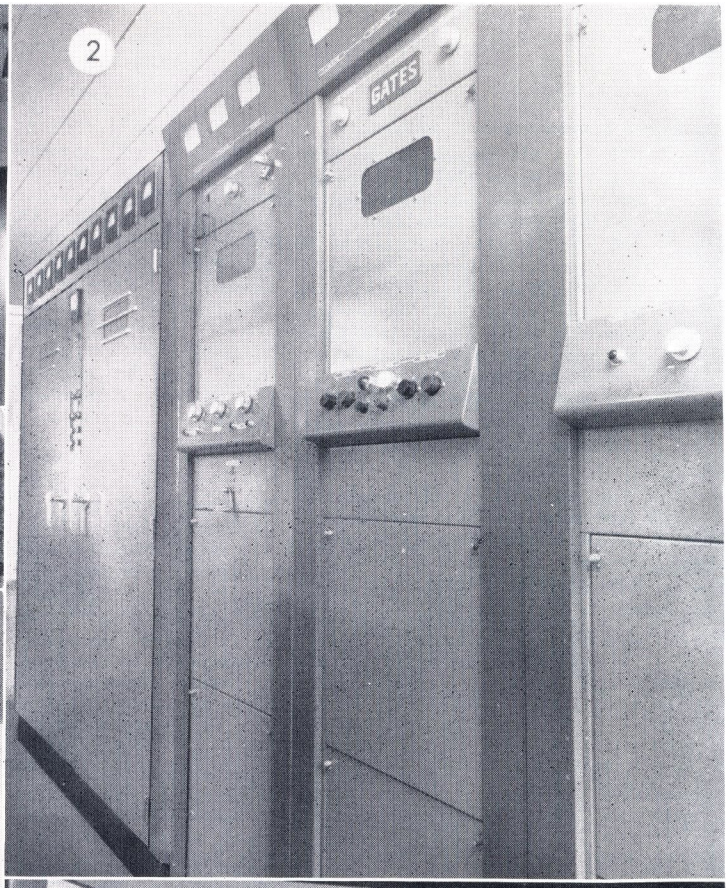
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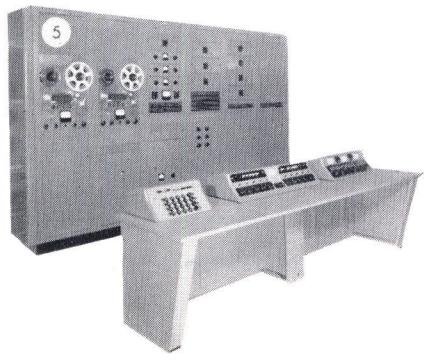
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ON LOCATION

1 — Gates 5000 watt television transmitter at KREX-TV, Grand Junction, Colorado.

2 — KREX Radio also boasts of a Gates BC-5P 5000 watt and BC-1F 1000 watt broadcast transmitter.

3 — At Caribou, Maine, WFST has this attractive installation of Gates BC-5P 5000 watt AM and BFE-250B FM broadcast transmitting equipment.

4 — Gordon Vaughn, Chief of KGKO, Dallas, Texas is logging one of the nation's unique installations. Here dual Gates 5 kw and 1kw broadcast transmitters feed dual phasing equipment for different day and night patterns and powers.

5 — Engineered for Hycon-Page, this is one of two extensive speech control systems provided the Government of Lybia Broadcasting System for installations at Tripoli and Bengazi, Lybia.

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PRICE LIST

Effective January 1, 1959

This price list has been carefully checked to avoid errors. We feel sure that our customers will recognize, due to rapidly changing economic conditions, that some prices may change even before the ink is dry on the price list. Therefore, prices must be subject to change without notice. All prices quoted are F. O. B. Quincy, Illinois. No charge is made for domestic packing. A small charge is made for special export packing where overseas shipment is required.

Page	ITEM	UNIT PRICE
15	**BC-50B, 50KW Transmitter,** M-4946, for 60 cycles	$87,675.00
	100% Spare Tube Kit, TK-263	7,374.05
	FCC Spare Tube Kit, TK-264	3,676.50
	Spare Blower, M-5519	1,599.00
	50 Cycle Modification Kit, M-5520	2,625.00
	NOTE: Where BC-50B Transmitter is ordered for 50 cycles, add the price of the M-5520 modification kit to the 60 cycle price.	
	Spare Vacuum Crystal in Holder, for BC-50B	66.00
16	**Supervisory Control Console with Desk and Tubes,** M-5120	1,500.00
58	**GY-1000B Packaged Radio Station**	6,265.00
	GY-1000BRDC Packaged Radio Station with Remote Control	7,278.00
	GY-500B Packaged Radio Station	5,740.00
	GY-500BRDC Packaged Radio Station with Remote Control	6,737.50
	GY250B Packaged Radio Station	4,820.00
	GY-250BRDC Packaged Radio Station with Remote Control	5,822.50
61	**BC-250GY, 250 Watt Transmitter**	2,750.00
	100% Spare Tube Kit, M-3074	155.40
	FCC Spare Tube Kit, TK-201	91.25
	Spare Crystal and Oven, JK57M	60.00

Always Keep Price List In This Convenient Pocket

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	Spare Blower, M-5519	1,599.00
	50 Cycle Modification Kit, M-5520	2,625.00
	NOTE: Where BC-50B Transmitter is ordered for 50 cycles, add the price of the M-5520 modification kit to the 60 cycle price.	
	Spare Vacuum Crystal in Holder, for BC-50B	66.00
16	**Supervisory Control Console with Desk and Tubes,** M-5120	1,500.00
24	**BC-100B, 100KW Transmitter,** M-5556	on application
	Optional Accessories for BC-100B Transmitter	on application
30	**BC-20B, 20KW Transmitter**	37,985.00
	Extra crystal and Oven, JK57M	50.00
	100% Spare Tube Kit, TK-229 (catalog page in error states TK-139)	2,055.00
37	**BC-5P-2, 5KW Transmitter,** M-5565	12,995.00
	Extra RF Cubicle, M-5190A	3,445.00
	100% Spare Tube Kit, TK321	737.50
	FCC Spare Tube Kit, TK322	490.90
	Spare Crystal with Holder	66.00
	Right or Left-Hand End Bells	110.00
41	**BC-10P, 10KW Transmitter**	16,995.00
	Spare Crystal and Holder, A-30866	66.00
	100% Spare Tube Kit, TK-314	1,094.66
	FCC Spare Tube Kit, TK-315	570.08
49	**BC-1T, 1000 Watt Transmitter**	4,495.00
	Spare Crystal and Holder, M-5602 (A-30866-1)	66.00
	100% Spare Tube Kit, TK-287	270.35
	FCC Spare Tube Kit, TK-288	136.15
53	**BC-500T, 500 Watt Transmitter**	3,975.00
	Spare Crystal and Holder, M-5602 (A-30866-1)	66.00
	100% Spare Tube Kit, TK-300	215.38
	FCC Spare Tube Kit, TK-301 (catalog page in error, states TK-307)	136.15
	Conversion Kit to Increase BC-500T to BC-1T, M-5614	459.00
56	**BC-250T, 250 Watt Transmitter**	3,145.00
	100% Spare Tube Kit, TK-306	152.58
	FCC Spare Tube Kit, TK-307	77.24
	Spare Crystal and Holder, A-30866	66.00
	Power Increase Kit to Convert BC-250T to BC-500T, M-5637	1,130.00
	Power Increase Kit to Convert BC-250T to BC-1T, M-5638	1,670.00

Page	ITEM	UNIT PRICE
58	**GY-1000B Packaged Radio Station**	6,265.00
	GY-1000BRDC Packaged Radio Station with Remote Control	7,278.00
	GY-500B Packaged Radio Station	5,740.00
	GY-500BRDC Packaged Radio Station with Remote Control	6,737.50
	GY250B Packaged Radio Station	4,820.00
	GY-250BRDC Packaged Radio Station with Remote Control	5,822.50
61	**BC-250GY, 250 Watt Transmitter**	2,750.00
	100% Spare Tube Kit, M-3074	155.40
	FCC Spare Tube Kit, TK-201	91.25
	Spare Crystal and Oven, JK57M	60.00
63	**GY-60B Complete Accessory Cabinet**	1,675.00
	100% Spare Tube Kit for GY-60B, TK-302	46.85
65	**BF-E-10B, 10 Watt FM Transmitter**	1,365.00
	BF-E-50B, 50 Watt FM Transmitter	1,695.00
	100% Spare Tube Kit for BF-E-10B, TK-308	34.02
	100% Spare Tube Kit for BF-E-50B, TK-309	45.92
	Multiplex Single Sub-Channel, M-5633A	750.00
	Multiplex Dual Sub-Channel, M-5633	950.00
67	**FM-250B, 250 Watt FM Transmitter**	3,150.00
	FM-250C, 250 Watt FM Transmitter (state frequency and bandwidth)	3,350.00
	100% Spare Tube Kit, TK-311	81.82
	Multiplex Single Sub-Channel, M-5633A	750.00
	Multiplex Dual Sub-Channel, M-5633	950.00
69	**FM-1B, 1000 Watt FM Transmitter**	5,195.00
	100% Spare Tube Kit, TK-312	162.54
	Multiplex Single Sub-Channel, M-5633A	750.00
	Multiplex Dual Sub-Channel, M-5633	950.00
73	**FM-5B, 5000 Watt FM Transmitter**	10,950.00
	100% Spare Tube Kit, TK-313	753.68
	Multiplex Single Sub-Channel, M-5633A	750.00
	Multiplex Dual Sub-Channel, M-5633	950.00
74	**TV-100L Antenna**	1,950.00
	TV-100H Antenna	1,600.00
	TV-500L Antenna	2,175.00
	TV-500H Antenna	1,825.00
	Multi-V Antenna, Type 1302	550.00
	Multi-V Antenna, Type 1304	1,150.00
	Multi-V Antenna, Type 1308	2,900.00
	Reducer,	on application
	Broad Band Antenna, FM-11	97.50
	Broad Band Antenna, FM-22	325.00
	Phase Monitor, 108D	600.00
	Phase Monitor, 108E	625.00
	Phase Monitor, 108F	650.00
	Field Intensity Meter, 120D	750.00
	Electric Generating Sets	on application

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Page	ITEM	UNIT PRICE
76	**BT-100A Television Transmitter**	6,150.00
	100% Spare Tube Kit, TK-212	277.24
	Spare Crystal and Oven, JK-07E (audio)	69.45
	Spare Crystal and Oven, JK-09E (visual), with H-17 Crystal	57.00
	50 Watt Television Transmitter, Model BT-50	5,750.00
79	**BT1A-L Television Transmitter**	16,000.00
	BT1A-H Television Transmitter	16,750.00
	Spare Crystal and Oven, JK-07E (audio)	69.45
	Spare Crystal and Oven, JK-09E (visual), with H-17 Crystal	57.00
	100% Spare Tube Kit, TK-160 (for BT-1AL)	440.02
	100% Spare Tube Kit, TK-258 (for BT-1AH)	445.46
80	**Directional Phasors**	on application
81	**Antenna Coupler,** Model 44	325.00
	Antenna Coupler, M-5178	160.00
	Antenna Coupler, M-5179	160.00
82	**Antenna Coupler,** M-5309A	595.00
	Antenna Coupler, M-5309B	875.00
	Antenna Couplers, High Power	on application
83	**Tower Choke,** M-3935A	60.00
	Tower Choke, M-3936A	81.50
	Tower Choke, M-3937A	95.75
	Tower Choke, M-3938A	115.00
	Austin Tower Choke, A-2100	288.00
	Austin Tower Choke, A-2101	298.00
	Austin Tower Choke, A-2102	288.00
	Austin Tower Choke, A-2103	298.00
	Austin Tower Choke, A-1970	321.00
	Austin Tower Choke, A-1971	377.00
	Austin Tower Choke, A-1972	372.00
	Austin Tower Choke, A-1973	366.00
	Isolation Coil, M-3073	237.50
	Coil Only, M-4561	150.00
	Isolation Unit, M-5634	195.00
	Isolation Coil, M-5573	110.00
	Phase Sampling Loop, M-3283	105.00
	Phase Sampling Loop, M-3389	115.00
	Phase Sampling Loop, M-3723	55.00
	Remote Metering Kit, M-3383	80.17
	Remote Metering Kit, M-3133	80.17
	Remote Metering Kit, M-3386	80.17
	Remote Metering Kit, M-3294	71.90
	Remote Metering Kit, M-3294B	71.90
	Remote Metering Kit, M-3294D	71.90
	Remote Metering Kit, M-5334	75.00
	Remote Metering Kit, M-5335	75.00
	Diode only, M-3759	50.00
	Diode only, M-2765B	67.50
86	**Frequency Monitor,** M-4990	765.00
	NOTE: Available approximately October 1, 1958. Prior to that time, order MO-2890, priced at $715.00.	
	100% Spare Tube Kit for Frequency Monitor, TK-281	16.49
	Remote Frequency Meter on Panel, M-5631	77.50
	Whip Antenna and Coupler, M-5549	52.50
87	**Modulation Monitor,** MO-2639	425.00
	Modulation Monitor, MO-2639A (short wave model)	425.00
	100% Spare Tube Kit, TK-113	12.18
88	**Transmitter Control Console,** CCD-2	850.00
	Transmitter Control Console, CCD-2A	818.00

Page	ITEM	UNIT PRICE
90	**Remote Control System,** RDC-10, for 1KW operation. Includes M-3759 antenna diode and M-4703C motor and rheostat assembly	875.00
	Remote Control System, RDC-10A, excluding motor tuning devices and antenna diode	746.00
	NOTE: To complete RDC-10A for powers above 1KW, see Page 93 for additional accessories.	
92	**Remote Control System,** RDC-200	1,450.00
	Extra Tower Light Indicator, M-5145	14.50
93	**Frequency Monitor Extension Unit,** M-5270	225.00
	Extension Meter, M-5631	77.50
	RF Amplifier, M-5144A	295.00
	Motor/Rheostat, M-4703A	100.00
	Motor/Rheostat, M-4703B	100.00
	Motor/Rheostat, M-4703C	105.00
	Tuning Motor, M-5066	85.00
	Tower Light Unit, M-5145	17.50
	Monitor Extension Meter, M-5210	60.00
	Monitor Extension Meter, M-5206	65.00
	Monitor Extension Meter, M-5208	65.00
	Monitor Extension Meter, M-5207	65.00
	Monitor Extension Meter, M-5209	65.00
	Antenna Diode, M-3759	55.00
	Antenna Diode, M-2765B	75.00
	Relay Assembly, M-4801	35.00
	Relay Assembly, M-4806	50.00
	Relay Assembly, M-5249	30.00
	Relay Assembly, M-5248	35.00
	Plate Voltage Unit, M-4719	13.95
	Output Loading Kit, M-4848A	173.00
	FM Amplifier, M-4791	250.00
	FM Indicator, M-4845	45.00
	Overload Relay, M-5129	32.50
	Rectifier, M-4825	43.00
	Plate Current Unit, M-4720	10.50
	Tuning Motor Assembly, M-4800	85.00
94	**Packaged 250 Watt Radio Station,** M-5640	on application
	Packaged 500 Watt Radio Station, M-5641	on application
	Packaged 1000 Watt Radio Station, M-5642	on application
	Studio Package, M-5639	on application
	Transmitter Package, M-5643: 250 watt	on application
	500 watt	on application
	1000 watt	on application
99	**Dualux Console,** M-5236A	1,745.00
	100% Spare Tube Kit, TK-294	56.14
	Intercom Sub-Station, M-5303	16.00
	Desk, M-5372	105.00
	Extra Preamplifier, M-5304	49.50
	Extra Relay, AF-111939	14.00
103	**Gatesway Console,** M-5133A	1,399.50
	Extra Relay, AK-11939	12.45
	Intercom Sub-Station, M-5303	16.00
	100% Spare Tube Kit, TK-290	44.51
109	**Yard Console,** M-5526	1,050.00
	100% Spare Tube Kit, TK-282	41.01
	Extra Preamplifier, M-5304	45.00
	Extra Muting Relay, AK-12626	10.75
	Desk, M-5528	25.00
	Speaker Matching Transformer, A-30601	2.75
	NOTE: Desk only available when purchased with Yard.	

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Page	ITEM	UNIT PRICE
115	**Studioette Console,** M-5381	860.00
	Spare Tube Kit, TK-270	28.22
	Extra Preamplifier, M-5304	45.00
	Extra Muting Relay, AK-12626	10.75
	Speaker Matching Transformer, A-30601	2.75
118	**Television Console,** TV-10 (M-5421A)	1,875.00
	Spare Tube Kit, TK-295	56.37
119	**Master Preset Console**	on application
120	**Program Amplifier,** M-5576	165.00
	Spare Tube Kit, TK-304	7.23
121	**Monitoring Amplifier,** M-5575	189.00
	Spare Tube Kit, TK-303	14.44
	Speaker Matching Transformer, A-30601	2.75
122	**UniQue Rack Mount,** M-5377	115.00
	UniQue Desk Mount, M-5377A	99.50
	Spare Tube Kit, TK-305	2.36
124	**Limiting Amplifier,** SA-39B	410.00
	Spare Tube Kit, TK-150	19.86
126	**Sta-Level,** M-5167	242.50
	Spare Tube Kit, TK-243	14.97
127	**Preamplifier,** PRE-4	74.00
	Spare Tube Kit, TK-112	3.50
	Program Amplifier, PGM-4	99.00
	Spare Tube Kit, TK-122	5.44
	Bridging Controls (all models)	6.50
	Panel and Shelf Assembly, PAS-1	25.00
	NOTE: For special color, add $2.00.	
	Base and Receptacle, BA-20	5.95
	Base and Receptacle, BA-21	6.25
128	**Monitoring Amplifier,** MON-4	110.00
	Spare Tube Kit, TK-121	6.89
	Power Supply, PWR-3	85.00
	Spare Tube Kit, TK-103	11.85
	Bias Supply, PWR-10	9.25
	Base Receptacle, BA-21	6.25
129	**Volume Indicator Panel,** V-22	108.25
	Switch and Fuse Panel, M-4242	37.50
	Patch Panel, C-150	25.13
	Patch Panel, C-1500	42.75
	Jack Mat, PD-1	7.75
	Jack Mat, PD-2	7.75
	Jack Mat, PD-3	7.75
	Patch Cord, PJ-12	7.41
	Patch Cord, PJ-13	7.59
	Patch Cord, PJ-14	7.86
	Patch Cord, PJ-15	8.07
130	**Equalizer,** SA-116	80.00
	Equalizer, SA-117	80.00
	Equalizer, SA-118	80.00
	Equalizer, SA-119	75.00
	Equalizer, SA-120	70.00
	Panel to Mount Equalizer, SA-121	10.00
	Equalizer, LE-1	25.00
	Equalizer, LE-2	91.00
	Equalizer, FSE-1	145.00
	Equalizer, FSE-2	145.00
131	**Cue-StaLevel Patch Cabinet,** M-5635	402.13
	Studio Warning Light, AM-1, AM-2, AM-3, AM-5	19.00
	Studio Warning Light, "On Air", AM-4	16.60
	Clock, Model RB-89E (includes tax)	14.25
	Clock, Model 602 (includes tax)	18.65
	Preamplifier, Equalized Type, M-5235	79.50

Page	ITEM	UNIT PRICE
131	**Spare Tube Kit,** TK-225	2.56
	Preamplifier, 3-stage Utility, M-5530	82.35
	Pickup Cartridge, 4G-050	9.95
	Pickup Cartridge, 4G-052	19.95
	Pickup Cartridge, 4G-053	30.95
	Pickup Cartridge, 4G-040	7.50
	Pickup Cartridge, 4G-041	7.50
	Pickup Cartridge, 4G-061	17.95
	Pickup Cartridge, 4G-063	17.95
	Pickup Cartridge, 4GD-01S02S	12.95
	Pickup Cartridge, 4GD-01D02S	22.50
	Pickup Cartridge, 4GD-01D02D	33.50
	Pickup Cartridge, 4GS-01D	20.50
	Pickup Cartridge, 4GS-02D	20.50
	Pickup Cartridge, 4GS-01S	10.50
	Pickup Cartridge, 4GS-02S	10.50
	Pickup Cartridge, 4G-01S	2.00
	Pickup Cartridge, 4G-02S	2.00
	Pickup Cartridge, 4G-03S	2.00
	Pickup Cartridge, 4G-01D	9.95
	Pickup Cartridge, 4G-02D	9.95
	Pickup Cartridge, 4G-03D	9.95
	Pickup Cartridge, RPJ-01S	2.00
	Pickup Cartridge, RPJ-02S	2.00
	Pickup Cartridge, RPJ-03S	2.00
	Pickup Cartridge, RPJ-01D	9.95
	Pickup Cartridge, RPJ-02D	9.95
	Pickup Cartridge, RPJ-03D	9.95
	Pickup Cartridge, RPJ-005	2.10
	Pickup Cartridge, RPJ-006	2.10
	Pickup Cartridge, RPJ-001	2.10
	Pickup Cartridge, RPJ-004	10.50
	Pickup Cartridge, RPJ-002	10.50
	Pickup Cartridge, RPJ-003	10.50
	Adapter, A1-504	.75
	Replacement Parts Kit, RKP-009B	.30
	GC-5, stereo w/diamond .5 stylus	26.95
133	**Desk Only,** CB-4	350.00
	Desk Only, with cut-outs for CB-100 Turntable, Switches and Wired, CB-4M	415.00
	Desk with Two CB-210A Turntables, Wired, CB-4N	1,123.00
	Desk with Two CB-100 Turntables, Rek-O-Kut S-160 Arms, etc., CB-4P	1,126.90
	NOTE: Catalog states Gray 106SP arms supplied. This is error as Rek-O-Kut S-160 arms are provided.	
	Desk Equipment with Console, CB-4R	2,523.10
	Desk Equipment with Console, CB-4S	2,526.40
	NOTE: CB-4S does not include preamplifiers for pickups. Order Model M-5530 listed Page 157.	
134	**Transcription Turntable,** CB-100	225.00
	Transcription Turntable, CB-100A, for 50 cycles	235.00
135	**Transcription Turntable,** CB-210	328.00
	Transcription Turntable, CB-210A	354.25
	Transcription Turntable, CB-225	418.00
	Transcription Turntable, CB-225A	444.00
136	**Transcription Turntable,** CB-150	484.50
	Transcription Turntable, CB-160	453.50
	Cabinet Only, CAB-6	90.00
	Gray 108C supplied with CB-150 and CB-160	90.00
137	**Auto-Trans,** M-5452	845.00
141	**Auto-Station complete** with production unit and automatic playback unit, M-5429	5,975.00

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Page	ITEM	UNIT PRICE
145	**Nite-Watch Automatic Programming Unit,** M-5671	2,395.00
	Nite-Watch, less cabinet for recorder, M-5628	2,345.00
	Recorder Panel, M-5664	97.50
	Auto-Trans Control Switch Box, M-5665	22.50
146	**Rack Cabinet,** RAK-1	120.00
	Single Corner Trim, TRM-1	10.00
	Double Corner Trim, TRM-2	11.00
	Side Panel, SP-1	19.00
	Shield, SH-1	5.50
	Shield, SH-2	6.25
	Terminal Board Mounting Bracket, BRK-1	3.40
	Ventilating Fan, RAK-F-1	39.50
	Rack Cabinet, RAK-7	75.00
	Joiner Trim, M-5577	12.50
147	**Record-Tape Service Cabinet,** M-5611	19.95
	Desk for Dualux or TV-10, M-5372	105.00
	Desk for Gatesway, M-5371	97.50
	Desk for Yard	25.00
	NOTE: Only available when purchased with Yard.	
	Inverter, 6U-RSF	49.90
	Inverter, 6S-HSJ	83.34
	Inverter, 12U-RSF	49.90
	Inverter, 12U-HSJ	83.34
	Tube Socket, M-3934	45.00
	Tube Socket, B-40216	150.00
	Blower, A-30687-1	130.00
148	**Desk, small with one cabinet,** M-5647	119.00
	Desk, large with one cabinet, M-5648	121.00
	Desk, small with two cabinets, M-5649	174.50
	Desk, large with two cabinets, M-5650	176.50
	Rack Cabinet Only, M-5651	64.50
149	**Audio Oscillator,** Model 200	138.00
	Noise and Distortion Meter, Model 400	168.00
	Gain and Measuring Set, M-3625	165.00
	Rectifier/Pickup Coil, M-3626	42.00
	Complete Proof of Performance Package, SA-131	513.00
150	**Sound Effects Wagon, less loudspeaker,** CSE-9	4,995.00
	Loudspeaker Assembly, LSB-2 (not illustrated in catalog)	358.00
	Spare Tube Kit, TK-155	66.40
152	**Dynamote with XL Connectors,** M-4880A	359.00
	Dynamote with P Connectors, M-4880B	369.00
	Continumatic Battery Compartment, M-4933	38.50
	Spare Tube Kit, TK-183	7.31
	Spare Batteries, M-5983	8.85
	Microphone Plug, Cannon XL3-12	.90
	Microphone Plug, Cannon P3CG-12S	3.09
153	**Biamote Remote Amplifier,** M-5136	215.00
	Microphone Plug, Cannon XL3-12	.90
	Spare Tube Kit, TK-183	7.20
154	**Monomote Remote Amplifier,** M-5532	165.00
	Microphone Plug, Cannon XL3-12	.90
	Spare Tube Kit, TK-280	5.48
155	**Unimote Remote Amplifier,** M-5531	105.00
	Microphone Plug, Cannon XL3-12	.90
	Spare Tube Kit, TK-280	5.48
157	**All-Purpose Utility Amplifier,** M-5530	87.50
	Spare Tube Kit, TK-280	5.48
	Chassis Connector, Cannon XL3-13	.93
	Microphone Plug, Cannon XL3-12	.90

Page	ITEM	UNIT PRICE
159	**Automote Remote Amplifier,** M-5500	195.00
	Microphone Plug, Cannon XL3-12	.90
	Battery Kit, M-5339	12.75
	Relay Battery, XX30	2.45
160	**Transmote with Carrying Case,** M-5311	145.00
	Transmote, less Carrying Case, M-5311A	136.75
	Battery Kit, M-5339	12.75
	Microphone Plug, Cannon XL3-12	.90
161	**Twinsistor Remote Amplifier,** M-5168	215.00
	NOTE: If carrying case not desired, deduct $4.95.	
	Microphone Plug, Cannon XL3-12	.90
	Battery Kit, M-5339	12.75
	Microphone with Swivel, M-5332	44.65
	Tubeless Tube, M-5312	39.75
	Microphone Plug, Cannon XL3-12	.90
	Output Connector, Cannon XL3-11	.93
	Battery Kit, M-5350	2.25
170	**Transmitter, 5KW,** Model HF-5B	21,900.00
	Transmitter, 10KW, Model HF-10B	24,059.00
	Transmitter, 5KW, Model HF-5BX	22,300.00
	Transmitter, 10KW, Model HF-10BX	24,459.00
	Transmitter, 5KW, Model HF-5C	19,250.00
	Transmitter, 10KW, Model HF-10C	21,500.00
	Transmitter, 5KW, Model HF-5CX	19,650.00
	Transmitter, 10KW, Model HF-10CX	21,900.00
	Transmitter, 5KW Telegraph, Model HF-5TX	15,485.00
	Transmitter, 10KW Telegraph, Model HF-10TX	15,985.00
	Crystal and Oven, HFXT-1 (JK-03-H17)	27.45
	Tube Set, HFTSB-5 (TK-252)	1,056.09
	Tube Set, HFTSB-10 (TK-253)	1,127.13
	Tube Set, HFTSX-5 (TK-254)	594.40
	Tube Set, HFTSX-10 (TK-255)	594.35
	Tube Set, HFK for Electronic Keyer	9.00
171	**High Frequency Broadcast Transmitter,** HF-100B	on application
	High Frequency Broadcast Transmitter, HF-50B	on application
177	**Transmitter, 20KW,** Model HF-20B	39,500.00
	Transmitter, 20KW, Model HF-20BX	39,750.00
	Transmitter, 20KW, Telegraph, Model HF-20TX	22,900.00
	Crystal and Oven, JK-03-H17	27.45
	Spare Tube Kit, TK-139	2,054.25
	Spare Tube Kit, TK-140	1,063.59
182	**Transmitter, 1KW,** Model HF-1M	5,875.00
	Spare Tube Kit, TK-249	304.22
	Crystal and Holder, H-7	14.95
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50
	Limiter/Filter Amplifier, M-5263	250.00
184	**Transmitter, 250 Watts Output,** Model CMG-1	1,895.00
	Crystal and Holder, H-7	14.95
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50
	Spare Tube Kit, TK-136	78.05
	Microphone Assembly, M-4576	39.50
	Filters (all models)	60.00
186	**CW Transmitter,** M-5569	693.00
	CW Transmitter, M-5569, less cabinet)	670.50
	Spare Tube Kit, TK-291	23.10
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50

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Page	ITEM	UNIT PRICE
187	**Modulator,** M-5570	467.00
	Modulator, M-5570, less cabinet	444.50
	Spare Tube Kit, TK-292	30.65
	Microphone Assembly, M-4576	39.50
188	**Transmitter,** CM-65	1,160.00
	Transmitter, CR-65	1,115.00
	Microphone Assembly, M-4576	39.50
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50
190	**Transmitter,** M-5078	595.00
	Crystal and Holder, H-7	14.95
	Crystal Oven, JK-02	12.50
192	**Transmitter,** CMP-1	4,350.00
	Transmitter, CMP-1A	4,350.00
	Transmitter, CMP-1B	4,350.00
	Transmitter, CMP-1D	4,695.00
	Remote Control Panel, CON-2	116.50
	Remote Control Panel, CON-3	on application
	Spare Tube Kit, TK-138	149.37
194	**Transmitter, 2 channel,** M-3449Y	1,975.00
	Spare Tube Kit, TK-222	60.27
	Coil Sets (any range)	18.00
	Crystal and Holder, H-7	14.95
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50
	Microphone Assembly, M-4237	39.50
195	**Transmitter, Single Channel,** M-3491Y	1,705.00
	Spare Tube Kit, TK-237	43.15
	Coil Sets (any range)	18.00
	Crystal and Holder, H-7	14.95
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50
	Microphone Assembly, M-5237	39.50
196	**Transmitter, Single Channel,** M-3680Y	1,519.00
	Spare Tube Kit, TK-237	45.06
	Coil Sets (any range)	18.00
	Crystal and Holder, H-7	14.95
	Crystal and Holder, H-17	14.95
	Crystal Oven, JK-02	12.50
	Single Channel Antenna Coupler, M-4239	90.00
	Microphone Assembly, M-5237	39.50
200	**Transmitter, 700 Watts Input,** Model CMW-1	3,250.00
	Microphone Assembly, M-4576B	47.50
	Spare Tube Kit, TK-137	142.75
	Crystal and Holder, H-7	14.95
	Crystal Oven, JK-02	12.50
202	**Transmitter,** M-5077	3,950.00
	Crystal Oven, JK-07E	49.50
	Crystal for above Oven, H-18	19.95
	Spare Tube Kit, TK-199	75.49
204	**Transmitter,** M-5076	12,600.00
	Crystal Oven, less Crystal, JK-07E	49.50
	Crystal for above Oven, H-18	19.95
	Spare Tube Kit, TK-198	373.64
205	**FM Relay Transmitter,** BFR-50C	1,875.00
	Spare Tube Kit, TK-310	69.40
	Single Multiplex Sub-Channel, M-5633A	750.00
	Dual Multiplex Sub-Channel, M-5633	950.00
	VHF-Dummy Antenna (heat exchanger), M-5508	on application
	Dummy Antenna, DU-551	215.00
	Dummy Antenna, DU-570	215.00
	Dummy Antenna, DU-151	105.00
	Dummy Antenna, DU-170	105.00

Page	ITEM	UNIT PRICE
205	**VHF Dummy Antenna,** M-5645	22.50
	Water Cooled Dummy Antenna (all models)	on application
206	**Communications Amplifier,** M-5263	250.00
	Communications Amplifier, M-5263A	250.00
	Spare Tube Kit, TK-235	7.60
	Selective Amplifier, M-3922	300.00
	NOTE: When purchased in quantities of 2 thru 9, the price is $260.00. In quantities of 10 or more, the price is $220.00.	
	Spare Tube Kit, M-4138	9.86
207	**Totalizing Recorder,** M-3815	1,375.00
	Spare Tube Kit, TK-230	36.25
209	**Voltage Regulator,** M-5295	293.50
	Voltage Regulator, M-5295A	315.00
	Voltage Regulator, M-5314	345.00
	Voltage Regulator, M-5314A	365.50
	Voltage Regulator, M-5315	445.00
	Voltage Regulator, M-5315A	468.00
	Voltage Regulator, M-5316	661.50
	Voltage Regulator, M-5316A	683.00
	Voltage Regulator, M-5317	351.00
	Voltage Regulator, M-5317A	372.00
	Voltage Regulator, M-5318	495.00
	Voltage Regulator, M-5318A	517.00
	Voltage Regulator, M-5319	762.50
	Voltage Regulator, M-5319A	783.00
	Voltage Regulator, M-5320	842.50
	Voltage Regulator, M-5320A	863.50
	Voltage Regulator, M-5321	976.50
	Voltage Regulator, M-5321A	998.50
	Voltage Regulator, M-5322	1,499.00
	Voltage Regulator, M-5322A	1,523.00
	Voltage Regulator, M-5323	1,894.00
	Voltage Regulator, M-5323A	1,916.00
210	**G1 Mica Capacitors:**	
	.00001 thru .00005 mfd.	21.50
	.0001 and .0002 mfd.	24.36
	.0004 mfd.	26.61
	.0005 and .001 mfd.	27.99
	.00155 and .002 mfd.	29.34
	.003 thru .005 mfd.	30.50
	.006 thru .02 mfd.	30.90
	G2 Mica Capacitors:	
	.0001 thru .005 mfd.	39.33
	.006 thru .02 mfd.	41.49
	G3 Mica Capacitors:	
	.00005 mfd.	66.54
	.0001 mfd.	72.60
	.0002 thru .0003 mfd.	78.66
	.0005 thru .002 mfd.	84.23
	.003 thru .03 mfd.	90.75
	G4 Mica Capacitors:	
	.00003 and .00005 mfd.	100.74
	.0001 and .00015 mfd.	126.18
	.00025 thru .0008 mfd.	132.69
	.001 thru .003 mfd.	137.46
	.004 mfd.	140.61
	.005 mfd.	145.20
	.006 mfd.	151.35
	.008 mfd.	156.00
	.01 thru .04 mfd.	163.46
	G5 Mica Capacitors:	
	.00005 mfd.	265.80
	.0001 mfd.	278.40
	.00025 and .00004 mfd.	302.40

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Page	ITEM	UNIT PRICE
210	**G5 Mica Capacitors:** (continued)	
	.0005 mfd.	326.40
	.001 mfd.	336.60
	.002 mfd.	322.80
	.0025 mfd.	328.80
	.003 thru .01 mfd.	340.80
	NOTE: Special values, not listed above, are available on special order at a price increase of 10% to the nearest value listed above. Approximately two weeks required for delivery. Orders for special values should be accompanied with a 20% deposit.	
	F1 Mica Capacitors:	
	All Values .0001 thru .01 mfd.	7.56
	.02 and .05 mfd.	8.58
	0.1 mfd.	9.08
	F2 Mica Capacitors:	
	All Values .00005 thru .05 mfd.	10.38
	0.1 mfd.	11.52
	0.2 mfd.	15.15
	0.25 mfd.	16.74
	F3 Mica Capacitors:	
	.00025 and .0005 mfd.	21.15
	.001 and .002 mfd.	23.55
	.005 mfd.	29.16
	.01 mfd.	33.12
	.05 mfd.	37.11
	0.1 mfd.	29.16
	0.25 mfd.	26.76
	0.5 mfd.	31.53
	1.0 mfd.	49.11
	Type E Mica Capacitors:	
	E-1245 thru E-1221	10.80
	E-12215	12.60
	E-1222	15.60
	E-1023	16.20
	E-1024	17.40
	E-1025	19.44
	E-721	9.60
	E-722	12.60
	E-723	13.80
	E-711	20.40
	E-3524	12.60
	E-3525	12.78
	E-3511	19.44
	E-3512	19.44
	E-3515	22.56
	E-215	19.32
	E-201	22.56
	Type H Mica Capacitors ..... (prices on catalog page)	
	Filter Capacitors:	
	7106-2	4.29
	7106-4	5.46
	7106-8	8.10
	7106-10	9.09
	7110-2	4.95
	7110-4	6.27
	7110-8	9.09
	7110-10	10.08
	7120-2	6.45
	7120-4	9.09
	7120-8	15.03
	7120-10	18.33
	7130-2	15.02
	7130-4	22.11
	7130-8	37.41

Page	ITEM	UNIT PRICE
210	**Filter Capacitors:** (continued)	
	7140-2	23.16
	7140-4	36.00
	7140-6	51.45
	7150-2	30.60
	7150-4	38.94
	7160-1	29.40
	7160-2	89.76
	7175-1	64.95
	7175-2	99.42
	TK70040	150.48
211	**Inductor,** 87FA4634	49.50
	Inductor, 6FB0854	29.25
	Inductor, 10FB0855	29.50
	Inductor, 13FB0856	30.50
	Inductor, 18FB1754	34.00
	Inductor, 26FB1755	34.50
	Inductor, 35FB1756	35.90
	Inductor, 58FB2845	43.75
	Inductor, 78FB2846	45.90
	Inductor, 128FB4635	59.50
	Inductor, 10FC0855	31.90
	Inductor, 13FC0856	32.25
	Inductor, 17FC1654	40.35
	Inductor, 24FC1655	45.35
	Inductor, 32FC1656	43.95
	Inductor, 42FC2266	41.80
	Inductor, 67FC2856	69.50
	Inductor, 78FC2568	74.00
	Inductor, 10FBT1066	59.90
	Inductor, 32FBT1658	94.50
	Inductor, 45FBT2158	162.50
	Inductor, 65FBT2559	130.00
	Inductor, 17FCT1178	97.00
	Inductor, 35FCT1779C	155.00
	Variable Inductor, 6VC0854	59.30
	Variable Inductor, 15VC1444	58.00
	Variable Inductor, 26VC2144	76.00
	Variable Inductor, 16VB1544	53.25
	Variable Inductor, 30VB2344	71.90
	Variable Inductor, 105VB3735	73.90
	Clip, LC4	.39
	Clip, LC6	.68
	Clip, LC8	.98
	Clip, RC6	2.50
	Clip, RC8	2.90
212	**Transformers for 250 watts:**	
	Modulation Transformer, BM-1	37.50
	Modulation Reactor, BR-1	57.30
	Driver Transformer, BD-1	20.70
	Power Transformer, AP-7235	129.00
	Swinging Choke, CG-109	27.00
	Smoothing Choke, CG-105	15.00
	Transformers for 500 watts:	
	Modulation Transformer, AM-30613	169.00
	Modulation Reactor, AC-10650	129.00
	Driver Transformer, AS-3172C	169.00
	Power Transformer, AP-12001E	142.00
	Swinging Chope, CG-109	27.00
	Smoothing Choke, CG-105	15.00
	Transformers for 1000 watts:	
	Modulation Transformer, AM-30469	239.00
	Modulation Reactor, AC-10465	159.00
	Driver Transformer, AS-3172C	169.00
	Power Transformer, AP-10459E	185.00
	Swinging Chope, AC-10458	139.00
	Smoothing Choke, AC-10457	37.00

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Page	ITEM	UNIT PRICE
212	**Transformers for 5000 watts:**	
	Modulation Transformer, AM-7718E	725.00
	Modulation Transformer, AM-7718M	1,290.00
	Modulation Reactor, AC-7719E	575.00
	Modulation Reactor, AC-7719M	960.00
	Power Transformer, AP-8000E	550.00
	Power Transformer, AP-8000M	970.00
	Input or Smoothing Choke, AC-3143E	99.00
	Driver Transformer, AS-3172C	169.00
	Transformers for 10,000 watts:	
	Modulation Transformer, AM-30643E	1,095.00
	Modulation Transformer, AM-3167M	1,995.00
	Modulation Reactor, AC-3168E	795.00
	Modulation Transformer, AM-3167M	discontinued
	Modulation Reactor, AC-3168E	discontinued
213	**Transformers for 10,000 watts** (continued)	
	Modulation Reactor, AC-3168M	2,275.00
	Driver Transformer, AS-3172C	169.00
	Power Transformer, AP-3090E	850.00
	Power Transformer, AP-3090M	1,375.00
	Input or Smoothing Choke, AC-3147E	190.00
	Transformers for 20KW:	
	Modulation Transformer, AM-8674M	3,166.00
	Modulation Reactor, AC-8675M	2,667.00
	Driver Transformer, AS-8672E	195.00
	Filter Reactor, AC-8673M	790.00
	Transformers for 50KW:	
	Modulation Transformer, AM-11788	5,375.00
	Modulation Reactor, AC-11787	4,975.00
	Power Transformer, AP-11785M	1,795.00
	Filter Reactor, AC-11786	1,075.00
	Filament Transformer, AF-7782E	54.00
	Filament Transformer, AF-10434E	129.00
	Filament Transformer, AF-11856E	139.00
	Filament Transformer, AF-30099E	89.00
	Filament Transformer, AF-10432E	129.00
	Filament Transformer, AF-10456R	39.00
	Filament Transformer, AF-11857E	115.00
	Audio Input Transformer, A1-3002U	39.00
	Audio Input Transformer, A1-10379T	16.50
	Audio Input Transformer, A1-10386T	16.50
	Audio Output Transformer, AO-10427T	14.75
	Audio Output Transformer, AO-10864T	18.50
	Audio Repeater Transformer, 114A	22.14
214	**Line Bracket,** M-3327	31.50
	Center Post Assembly, M-3864	18.50
	End Plate, M-3328	38.00
	Horn Gap, M-3322	48.00
	Feedthru Bowl, M-2870D	13.95
	Feedthru Bowl, M-3254	13.95
	Feedthru Bowl, M-5280	9.00
	Feedthru Bowl, M-5281	9.00
215	**Coaxial Cable,** RG-8U per ft.	.14
	Coaxial Cable, RG-11U per ft.	.13
	Coaxial Cable, RG-17U per ft.	.65
	Coaxial Cable, RG-19U per ft.	1.12
	Coaxial Cable, RG-22U per ft.	.17
	Coaxial Cable, Heliax Type H-0 per ft.	1.50
	Coaxial Cable, Heliax Type H-1 per ft.	3.40
	End Terminal, Heliax 20-T	30.00
	Flange End Terminal, Heliax 21-R	50.00
	Air-Dielectric Coaxial Cable, Type 83 per ft.	.80

Page	ITEM	UNIT PRICE
215	**End Terminal,** 1701-GV	12.00
	End Terminal, 1701-P	8.00
	End Terminal, 1701-R	10.00
	Air-Dielectric Coaxial Cable, Type S-450 per ft.	1.35
	End Terminal, 1703AGV	16.00
	End Terminal, 1703-AP	11.00
	End Terminal, 1703-AR	14.00
	Air-Dielectric Coaxial Cable, Type 451 per 20 ft. length	60.00
	Air-Dielectric Coaxial Cable, Type 12211, any special length per ft.	19.00 plus 25c per inch
	Right Engle Elbow, 1051-M	40.00
	45° Elbow, 1151-M	40.00
	Gas Inlet Coupling, 1351	12.50
	Clamp Connector, T-1551	15.00
	End Terminal, 13942	46.50
	No. 10 Soft Drawn Copper Ground Wire, GR-10 per cwt.	61.00
	NOTE: Copper ground wire prices will vary upward and downward in accordance with market.	
	Copper Ground Strap, 2" per ft.	.23
	Copper Ground Strap, 4" per ft.	.40
	Ground Rod, GR8R	4.35
	Ground Screen, GR24SC per sheet	51.00
	Dry Air Pump, 878	48.00
	Dehydrator, Automatic, 1910	450.00
	Gas Distribution Manifold, 6600	14.00 plus $12.00 per outlet
	Single Obstruction Light, OB-20	13.35
	Single Obstruction Light, OB-21	13.35
	Double Obstruction Light, OB22-4	26.70
	Double Obstruction Light, OB-22P-4	30.00
216	**Code Beacon,** KG114-3	293.35
	Code Beacon, RG114-4	293.35
	Replacement Lamp, 100A21-TS	.42
	Replacement Lamp, 111A21-TS	.42
	Beacon Lamp, 500PS-40	2.50
	Beacon Lamp, 620PS-40	2.50
	Tower Lighting Kit, Spec. A1 (exposed wiring)	
	Kit 1E-2A, less photo-cell unit	80.00 plus 30c per tower ft.
	Kit 1E-2AP, includes photo-cell unit	160.00 plus 30c per tower ft.
	Tower Lighting Kit, Spec. A2 (exposed wiring)	
	Kit 2E1-2A, includes beacon flasher but less photo-cell unit	493.00 plus 67c per tower ft.
	Kit 2E1-2AP, includes beacon flasher and photo-cell flasher LC-2074A	600.00 plus 67c per tower ft.
	Tower Lighting Kit, Spec. A3 (exposed wiring)	
	Kit 3E1-4A, includes beacon flasher but less photo-cell unit	546.70 plus 67c per tower ft.
	Kit 3E1-4AP, includes beacon flasher and photo-cell unit LC-2074A	660.00 plus 67c per tower ft.

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Page	ITEM	UNIT PRICE
216	**Tower Lighting Kit, Spec. A4** (conduit wiring)	
	Kit 4C2-6A, includes 2-circuit beacon flasher, less photo-cell unit	1,150.00 plus $1.20 per tower ft.
	Kit 4C2-6AP, includes 2-circuit beacon flasher and photo-cell control LC-2072 or LC-2073	1,240.00 plus $1.20 per tower ft.
	NOTE: Kits A2, A3 and A4 are shipped freight prepaid to common carrier shipping point nearest to customer.	
	NOTE: Price per tower foot is for open wire connecting cable.	
	Flasher and Photo-Cell Unit, LC-2077	247.20
	Flasher and Photo-Cell Unit, LC-2076	282.50
	Beacon Flasher, BF-31	60.00
	Beacon Flasher, BF-32	85.30
	Photo-Cell Unit, 63305C	55.00
	Photo-Cell Unit, 63306C	55.00
	Flasher Unit, LC-2074	158.90
	Flasher Unit, LC-2072	178.90
	Rhombic Antenna, RTA-330	440.00
	Transmission Line for RTL-300	451.00
	Dissipation Line for TDL-340	198.00
	Doublet Transmitting Antenna, DTA-430	110.00
	Transmission Line for Doublet, DTL-400	407.00
217	**Telectro Recorder,** 938C	1,340.00
	Telectro Recorder, 938R	1,150.00
	Telectro Recorder, 938P	1,300.00
218	**Magnecord M-90ACC in new metal console cabinet**	1,450.00
	(a) **Magnecord M90AX Transport**	935.00
	(b) **Magnecord M90CX Amplifier**	360.00
	(c) **12B Portable Case** for M90AX	70.00
	(d) **5C Portable Case** for M90CX	40.00
	NOTE: Items (a) thru (d) comprise the M-90ACC recorder. Items (a) and (b) comprise the M-90ACX recorder.	
	Magnecord (binaural model not listed in catalog), M-90BAC, in Portable Case	2,165.00
	Binaural Model, less Case, M-90BACX	2,035.00
	Magnecord, 727AX (new type number P75-AX)	535.00
	Magnecord, 727BX (new type number P75-CX)	265.00
219	**Auditorium Sound System,** M-5666	965.00
	Relay Receiver, CM-0 (88-108 Mc as ordered)	295.00
	Multiplex Adaptors for above	75.00
	Magnecord, S36-BX	385.00
	Magnecord, S36-B	415.00
	Pentron, NL-2	159.95
	Magnecord, PT6-6AX	375.00
	Magnecord, PT6-6JX	265.00
	Magnecdord, PT6-6A	405.00
	Magnecord, PT6-6J	295.00
	Magnecord Reel Adapter, 93X28	55.00
220	**Loudspeaker,** 1203A	19.95
	Speaker Cabinet, A1-406B	64.95
	Speaker Cabinet, A1-406M	64.95
	Speaker Cabinet, A1-406U	56.20
	Speaker Enclosure, A1-412	37.95
	Speaker Enclosure, A1-411	35.95
	Speaker Enclosure, A1-414	32.95
	Wall Baffle, DWB-12	8.40

Page	ITEM	UNIT PRICE
220	**Wall Baffle,** DWM-12	8.40
	Corner Baffle, C12A-B	10.95
	Corner Baffle, C12A-M	10.95
	Ceiling Baffle, AL8-A	7.29
	Disc Recorder, 6N	1,283.50
	Disc Recorder, 6NP	1,323.50
	Disc Recorder, 6NC	1,383.50
	Adapter, GR-45	25.00
	Microgroove Feed Screw, GR-244	61.20
	Recording Amplifier, A-93	387.00
	Cutting Head, 1D-16	269.00
	Cutting Head, 1D-500	269.00
	Recording Stylus (all types)	4.95
	Speaker Matching Transformer, ZY-2002	4.95
	Speaker Matching Transformer, ZY-4004	4.95
	Speaker Matching Transformer, ZY-2003	5.95
	Jensen Speaker, P8S	6.81
	Jensen Speaker, P10T	6.45
	Jensen Speaker, P12T	7.08
	Turntable, T68H	170.00
	Turntable, T18H	131.00
221	**Conelrad Receiver,** 117R905	140.00
	Conelrad Receiver, 117R906	140.00
	Mobile Phone, TR-325	360.00
	Mobile Phone, TR-426	360.00
	Mobile Phone, TR-426A	360.00
	Loudhailer, 5907	125.00
	Chair, Type 255	65.00
	Disc Cabinet, A-7	24.00
	Disc Cabinet, B-10	27.00
	Disc Cabinet, C-12	36.00
	Disc Cabinet, D-16	49.50
	Film Separator, SR-420	8.00
	Film Separator, SR-6820	8.75
	Film Separator, SR-1216	9.50
	Tape Cabinet, TR-742	15.00
	Tape Cabinet, TR-1021	10.80
	Film Cabinet, FSO-6120	90.00
	Film Reel-Mobile, RM-77	89.25
	Disc Reel-Mobile, DM-360X	183.00
	Disc Cabinet, C-540	240.00
222	**Transcription Arm,** 108C	39.95
	Transcription Arm, 216	36.50
	Transcription Arm, GR-16	31.50
	Tubular Arm, 160	30.95
	Tubular Arm, 120	27.95
	Stylus Gauge, 301	1.50
	Equalizer, 602C	57.50
	Tape Splicer, 2S4H	8.65
	Industrial Tape Splicers (all models)	55.00
	Audio Terminal Block, PT-106	7.05
	Telegraph Key, 114-321	5.85
	Headphones, BA-200	12.90
	Headphones, BA-201	8.10
	Head Set, 107	6.60
	Head Set, 35-3	discontinued
	Shielded 2C Wire, SH-20 per ft.	.055
	Shielded Wire, 8440	
	100 ft. package	4.50
	500 ft. package	19.50
	1000 ft. package	39.00
	Shielded Wire, 1261	
	250 ft. package	11.97
	500 ft. package	22.05
	1000 ft. package	44.10
	Shielded Wire, 8428	
	50 ft. package	5.40
	100 ft. package	10.50
	Microphone Cable, MIC-100 per ft.	.08
	Microphone Cable, 8410 per ft.	.09

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Page	ITEM	UNIT PRICE
223	**Oscilloscope,** 770	411.00
	Oscilloscope, Portable, 685	313.00
	Tube Tester, 6000	189.25
	Tube Tester, Industrial, 539B	409.00
	Blank Panels, BL-1, per 1¾" multiples	1.50
	FM Monitor, 335B	1,695.00
	Desk Rack Cabinet, M-5644	22.50
	Cannon Connectors:	
	XL3-14	.72
	XL3-11	.93
	XL3-13	.93
	XL3-12	.90
	XL3-35-2G	5.61
	XL3-35	2.64
	P3-14	1.99
	P3-CG-11S	3.78
	P3-CG-12S	3.09
	P3-13	3.35
	P3-35	5.21
	P3-35-2G	11.13
	Volt-Ohm-Meter, 260	43.95
	RF Probe, 0073	7.50
	Vacuum Tube Volt-Ohm-Meter, 311	64.95
	Tape Eraser, HD-11	23.38
	Telephone Pickup Coil, HP-61	4.77
	Variable Speed Turntable, Model 60	59.50
224	**Receiver,** NC66	129.95
	Receiver, NC109	199.95
	Receiver, NC188	159.95
	Receiver, SX62A	349.95
	Receiver, SX100	295.00
	Receiver, SX104	discontinued
	Receiver, MCA100L	124.95
	Receiver, MCA100H	124.95
	Receiver, MR33	64.50
	Receiver, MR10	64.50
	Receiver, PR31	49.95
	Receiver, GPR90	495.00
	Receiver, GPR90RX	640.00
	Adapter, GSB-1	149.50
225	**Remote Control System,** 117C903	280.00
	VFO/Crystal Oscillator, M-5230	950.00
	Crystal and Oven, JK-57	50.00
	Citizens Band Transceivers:	
	12TR500	498.00
	12TR500 with Remote Control	528.00
	12/117TR500 for 12 volt DC or 117 volt AC	523.00
	Set of 3 Crystals	16.00
	Roof Top Antenna, 8355	9.50
	Dynamic Microphone, 8417	4.00
	50 Kc IF Filter (optional)	13.80
226	**Spotlight,** 44N3TVG	29.50
	Spotlight, 44N6TVG	34.30
	Spotlight, 44N8TVG	67.50
	Spotlight, 44N12TVG	129.00
	Floor Stand, 1420CR	39.00
	Floor Stand, 1421CR	42.00
	Pole-Op, 44NP8G	95.00
	Handle and Loop, Type 44	17.50
	100 Watt Bayonet Base	1.50
	150 Watt Bayonet Base	2.95
	500 Watt Med. Pre-Focus	5.50
	750 Watt Med. Pre-Focus	6.60
	1000 Watt Mog. PF	7.10
	1500 Watt Mog. PF	12.10
	2000 Watt Mog. PF	14.35
	2000 Watt Mog. BP6	14.00

Page	ITEM	UNIT PRICE
226	**Kliegl Light,** 1365EG	58.75
	Kliegl Light, 1365EG-IRS	75.25
	Kliegl Light, 1366EG	122.50
	Kliegl Light, 1366EG-IRS	139.00
	Kliegl Light, 1174G	406.00
	Kliegl Light, 1178G	629.00
	Scoop Light, TV-1155G	44.50
	Hanger, TV-111	46.00
	Hanger, TV-112	46.00
	Hanger, TV-113	70.50
	TV Rebroadcast Receiver, TR-1	850.00
	Video Patch Panel, Type 963	215.00
	Looping Plug, Type 965	6.50
	Patch Cord, 967A	6.50
	Patch Cord, 967B	6.75
227	**Microphone,** Model 666	153.00
	Microphone, Model 667	360.00
	Microphone, Model 665	90.00
	Microphone, Model 664	51.00
	Microphone, Model 655C	120.00
	Microphone, Model 654	60.00
	Microphone, Model 636	43.50
	Microphone, Model 623	34.20
	Microphone, Model 635	49.20
	Microphone, Model 630	31.50
228	**Microphone,** Model 605	19.50
	Microphone, Model 611	27.00
	Microphone, Model 649	discontinued
	Microphone, Model 646	88.50
	Microphone, Model 210KK	21.00
	Microphone, Model 647	49.50
	Microphone, Model 648	33.60
	Swivel, Type 448	14.40
	Shock Mount, Type 345	9.00
	Shock Mount, Type 346	9.00
	Shock Mount, Type 366	24.00
	Clamp, Type 300	6.00
	Desk Stand, Type 418	6.00
	Desk Stand, Type 418S	9.00
	Desk Stand, Type 419	6.00
	Desk Stand, Type 419S	9.00
	Desk Stand, Type 420	12.00
	Desk Stand, Type 423A	3.00
	Desk Stand, Type 428	10.50
	Wind Screen, Type 524	4.80
	Blast Filter, Type 335	3.30
229	**Microphone,** Model DR-330	150.00
	Desk Stand, Type ND	6.00
	Floor Stand, Type CS-33	7.05
	Desk Stand, ,Type DS-7	3.00
	Banquet Stand, Type TS-6	5.76
	Floor Stand, Type MS-25	15.00
	Floor Stand, Type MS-10C	5.85
	Boom Bracket, BB-1	4.50
	Boom Stand, BS-36	36.00
	Boom Stand, BS-36W	42.00
	Speaker Cabinets:	
	"The Empire", mahogany	99.00
	"The Empire", limed oak or walnut	109.00
	"The Aristocrat", mahogany	72.00
	"The Aristocrat", limed oak or walnut	79.00
	"The Baronet", mahogany	45.00
	"The Baronet", limed oak or walnut	49.00
	Loudspeakers:	
	15TRX	149.00
	15TRXB	79.00
	SP12	66.00
	SP12B	35.00
	Type 848	45.00
	Type 847	27.80
	SP8B	29.50

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Page	ITEM	UNIT PRICE
230	**Recording Tape:**	
	111-1.5	.47
	111-3	.90
	111-6	1.50
	111-12	2.34
	111-24H	5.67
	111-24R	7.27
	111-48H	11.53
	111-48R	14.73
	120A-6	2.34
	120A-12	3.67
	190-9	2.34
	190-18	3.67
	190-36R	8.57
	190-36H	6.67
	190-72R	17.33
	190-72H	13.33
	150-9	2.40
	150-18	4.13
	150-36H	8.00
	150-36R	9.60
	150-72H	16.00
	150-72R	20.00
	200-24	5.83
	200-48R	13.67
	41-½S	.39
	43-1.5	.60
	200	6.00
	GR-LST	12.50
	RB-3	.17
	RB-4	.37
	RB-5	.44
	RB-7	.50
	RB-10½M	3.00
	NOTE: Special quantity discounts are offered on recording tape. Write for prices, stating quantity.	
	Tape Recorder, Presto C800-1	1,649.00
	Tape Recorder, Presto R800-1	1,375.00
	Tape Recorder, Presto P800-1	1,480.00
231	**Professional Junior Spring Head Tripod,** GR-973	200.00
	Model B Triangle, GR-974	26.00
	Friction Head Tripod, GR-975	150.00
	Carrying Case, GR-976	18.00
	Projector, 614CBVM	2,400.00
	Telejector, 3B	695.00
	Manual Control Unit, Type 35A	295.00
	Additional Turrets, 31L or 31R	14.00
	Mounting Shelf, 63A	130.00
	Multiplexer, 62A	245.00
232	**Television Camera with Viewfinder,** 320-A	3,500.00
	Film Camera, 320-F, includes Dummy Top	3,000.00
	Lenses:	
	A-069-2, ½" f/1.5, wide angle	125.00
	A-069-1, 1" f/1.5, normal	98.00
	A-1693, 2" f/1.5, Elgeet	89.50
	A-069-4, 2" f/1.9, medium telephoto	88.00
	A-1694, 3" f/1.9, Elgeet	73.50
	A-069-3, 3" f/2.5, telephoto	88.00
	A-1695, 4" f/2.7, Elgeet with sun-shade	88.95
	A-069-5, 4" f/4.5, telephoto	74.00
	A-069-6, 4" f/2.5, telephoto	189.95
	A-069-7, 6" f/4.5, telephoto	98.50
	B-114-2, 30-150mm remote control lens	1,800.00
	Zoom lens, 1" to 4" manually operated, Pan Cinor	460.00
	Zoom lens, ¾" to 3" manually operated, Pan Cinor	410.00

Page	ITEM	UNIT PRICE
233	**Camera Control,** 720-A	2,400.00
	Master Monitor, 635-A	1,970.00
234	**Film Camera,** 320-F, with Dummy Top	3,000.00
	Pedestal, C-080	120.00
	Video Monitor, 602-A	399.00
	Synchronous Generator, 410-B	1,850.00
	Power Supply, 840 (840-A)	245.00
	Power Supply, 850 (850-A)	270.00
	Power Supply, 860 (860-A)	475.00
	Switcher and Fader, 520 (520-A)	1,625.00
235	**Dage Color Cameras with Accessories**	on application

MONOCHROME CAMERA CHAINS

Professional dual studio camera system, including the following: (domestic prices only)

- **2 Model 320-A Cameras with Viewfinders,** 4-lens turret and each camera with 4 standard or telephoto lenses as selected
- **2 Model 720-A Camera control consoles**
- **1 Model 635-A Master Monitor** with 520-A switcher and fader mounted in master monitor
- **3 860-A Power Supplies**
- **1 410-B Synchronous Generator**
- **2 Professional Junior Tripods**
- **2 Dollies for Tripods**

All necessary camera control cables, interconnecting cables, pulse cables, with plugs, video cable, power cable and termination plugs

Net price for package 17,500.00

Single Studio Camera System — (domestic prices only)

This system is where customer has synchronous generator and does not need master monitor and switcher and includes the following:

- **1 Model 320-A Camera** with viewfinder, 4-lens turret and 4 standard or telephoto lenses as selected
- **1 Model 720-A Camera control console**
- **1 Professional Junior Tripod**
- **1 Dolly for Tripod**

All necessary camera control cables, etc.

Net price for package 6,918.00

235 **Film Camera Pickup System**

The following system includes a complete film camera pickup system with dual projectors. Where projectors are not needed, deduct $ 4,800.00

- **1 320-F Film Camera** with dummy top
- **1 720-A Camera Control Console**
- **1 3" f/2.5 Lens**
- **1 C-105 Multiplexer** with stand
- **2 614-CBVM Bell & Howell Television Projectors**
- **1 Selectroslide** single turret slide projector
  Remote control for projection equipment
- **Slide Projection Pedestal**

Necessary camera cables, connectors, light shield and pulse terminating plug

Net price for package 11,455.00

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Page	ITEM	UNIT PRICE
236	**Selectroslide,** 340A	1,095.00
	Selectroslide, 330A	825.00
	Selectroslide, 330B	849.00
	Selectroslide, 322A	255.00
	Selectroslide, 322B	267.00
	Lens, Support, 349	15.00
	Lens, 343	42.00
	Lens, 344A	63.00
	Lens, 344	48.00
	Lens, 345	75.00
	Lens, 348	110.00

Page	ITEM	UNIT PRICE
	Holmes ITP Projector	895.00
	Remote Control, GR-51	75.00
	Pedestal, GR-52	125.00
	Exciter Lamp, GR-53	.95
	500 Watt Bulb, GR-54	4.15
	Preamplifier Tube Kit, GR-55	7.45
	Tubeless Modulation Monitor, M-3737	95.00
	50KW Air-Cooled Dummy Antenna	on application

Non-Catalog Dage Accessories

The following accessories are not listed in the Gates catalog:

C466-1 Camera Cable	$60.00 plus 75c a ft.
B052-1 Pulse Cable	57.50 plus 36c a ft.
B197-1 Pulse Cable (sync. gen. to Camera Control)	26.50 plus 36c a ft.
B054-1 Intercom Cable	38.25 plus 25c a ft.
A-080, RG59/U Cable with Connectors	8.00 plus 8c a ft.
B736 Power Cable (860 Power Supply to 720 Camera Control)	12.00 plus 40c a ft.

NOTE: Above cables are normally supplied with equipment.

C582 Cable to Adapt Dage 320-F Film Camera to RCA Iconoscope Control	$ 150.00
C582-A Cable to Adapt Dage 320-F Film Camera to GE Iconoscope Control	150.00

073-1 BNC Cable Connector for RG59U Cable	1.15
073-2 BNC Cable Connector for RG58U Cable	1.15
073-3 BNC 75 Ohm Termination Plug	1.15
A-870-1 BNC UHF to Dage Adaptor	4.50
A-871-1 BNC to UHR Adaptor	3.25
A-872-1 BNC Tee Connector	4.50
A-087-1 BNC to Join 073 Connectors	4.00
A-150-1 Pulse Termination Plug	24.00
081 BNC Chassis Connector	1.47
B714-1 Headset (Telex for Intercom)	50.00
Type 1311 Five-Channel Video Distribution Amplifier	580.00
One Set Console End Sections, listed in illustration top of Page 235, to Style 720-A and 635-A Units when ganged together	145.00

Dage Transistor Camera and Synchronous Generator on application

Test Equipment

The following test equipment recommended for maintenance of television equipment:

GR-DG-1 Bar Generator	$ 475.00
524-D Textronix Oscilloscope	1,388.00
WV-77A Vacuum Tube Volt-Meter with WG-222 Probe	51.00
WR-59C TV Sweep Generator	274.50
WR-89A Marker Generator	242.50

NOTE: Gates engineers will gladly assist customers in proper selection of television camera equipment or provide recommended layouts. — Feel free to write.

●

GATES RADIO COMPANY
A SUBSIDIARY OF HARRIS-INTERTYPE CORPORATION
Tel. BAldwin 2-8202
Quincy, Illinois, U. S. A.

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