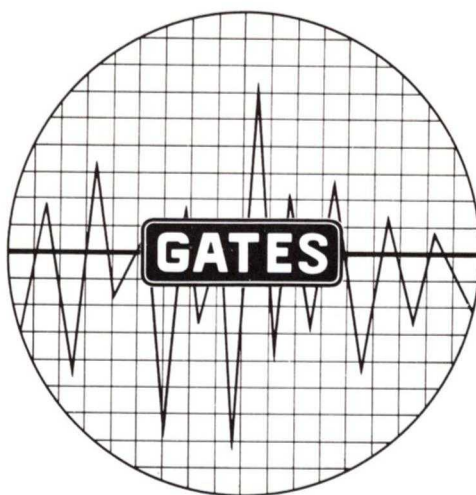




HIGH FREQUENCY AND COMMUNICATIONS TRANSMITTERS, ACCESSORIES

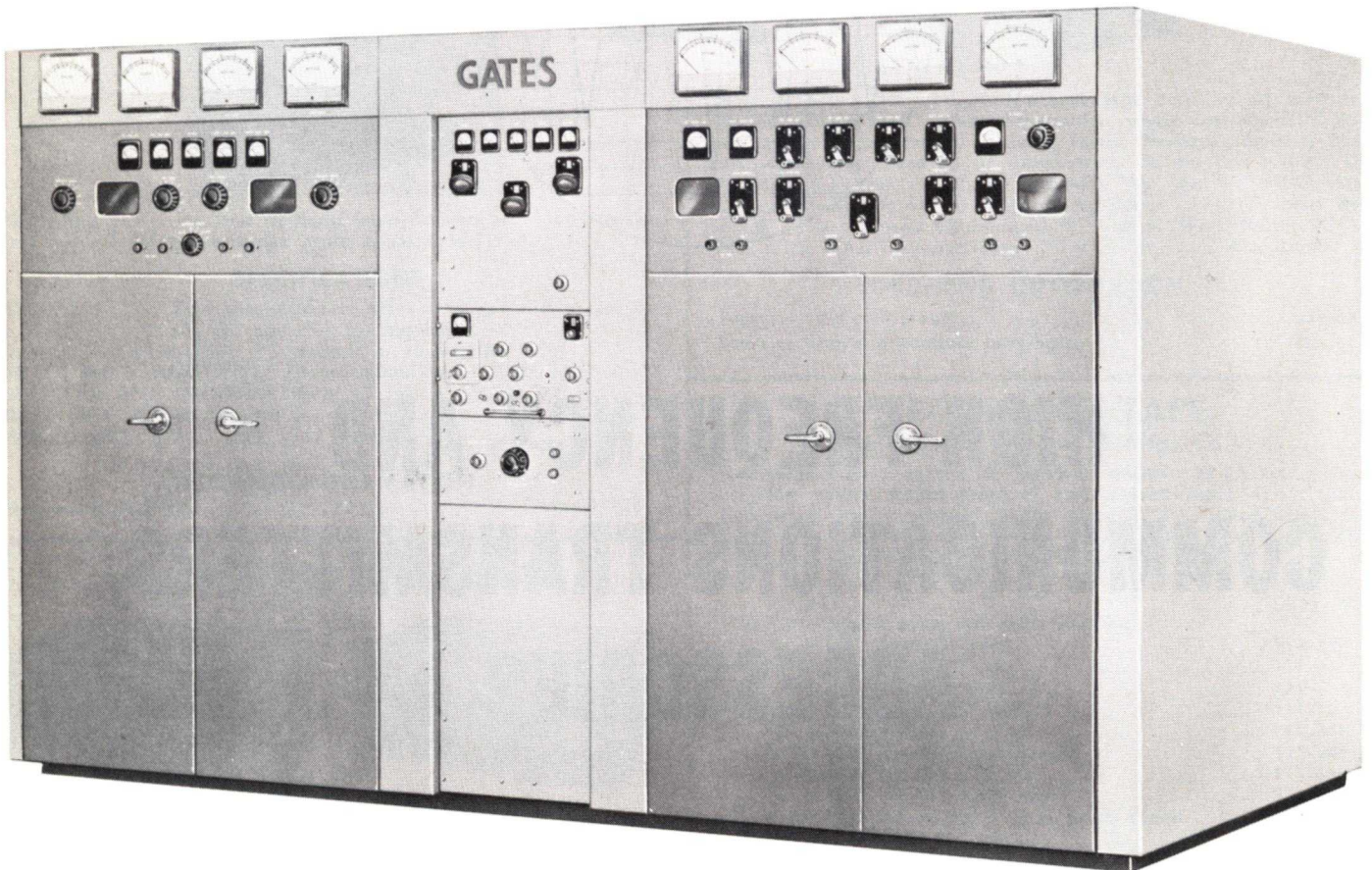
PAGES

190-227	TRANSMITTING EQUIPMENT
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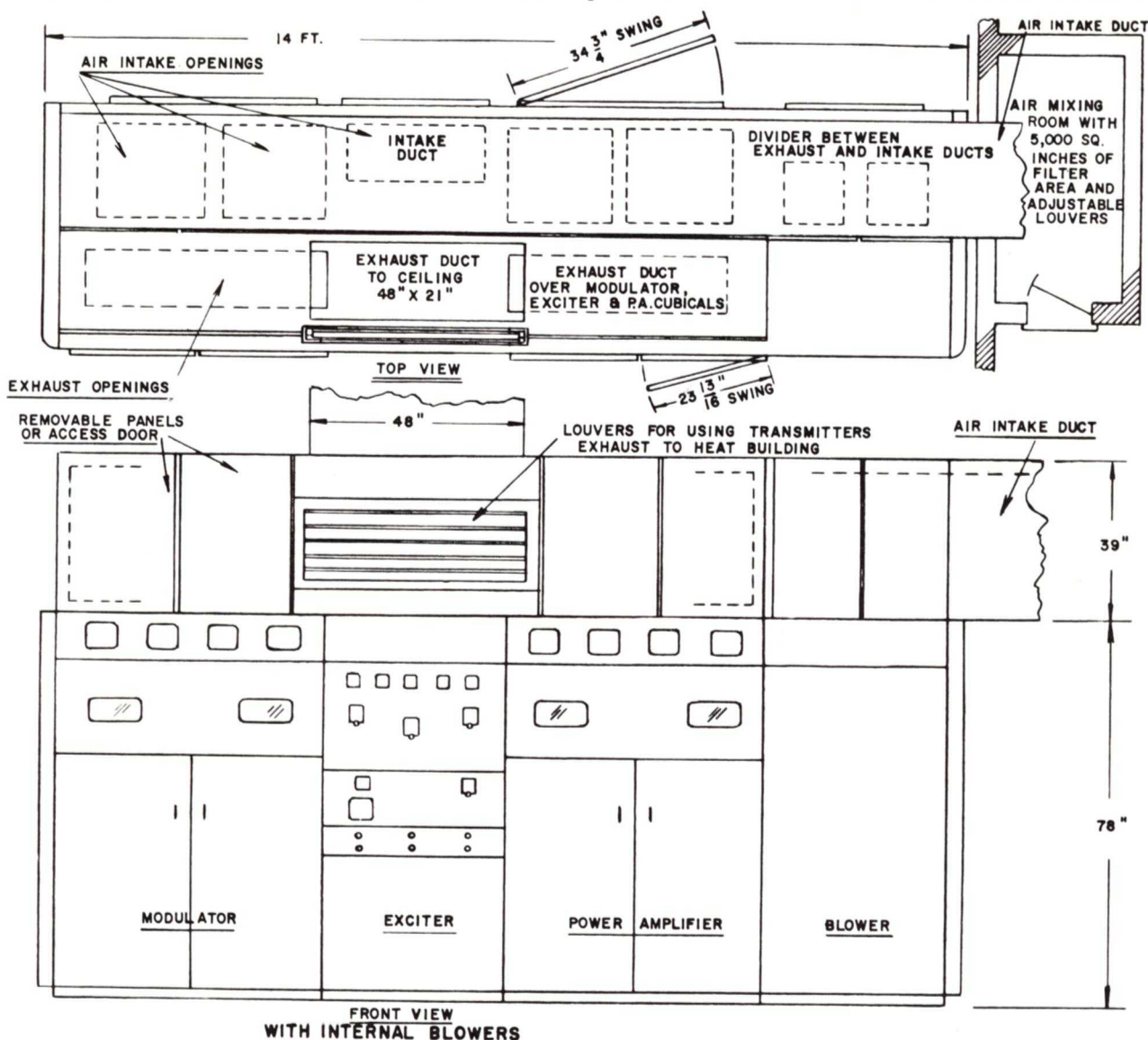
50,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

Model HF-50C



The Gates HF-50C high frequency broadcast transmitter is high level plate modulated and capable of delivering 55,000 watts of power into a balanced line of 300-800 ohms on any frequency between 4-30 MCS. Outstanding advantages of the HF-50C are: small, compact size requiring a minimum of floor space-transmitter proper only 6½ ft. high, 11 ft. wide, 61⅝ inches deep; rapid frequency change; interchangeability of PA and modulator tubes; less tube types; longer tube life; and low power consumption—only 100 KW at average programming. Introduced in 1959, following wide acceptance of similar models now in use at station ELWA, Morovia, Liberia and the Dominican Republic, the HF-50C has been especially designed to operate in world wide climates and for the most rigorous demands of continuous duty.

HF-50C 50,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER



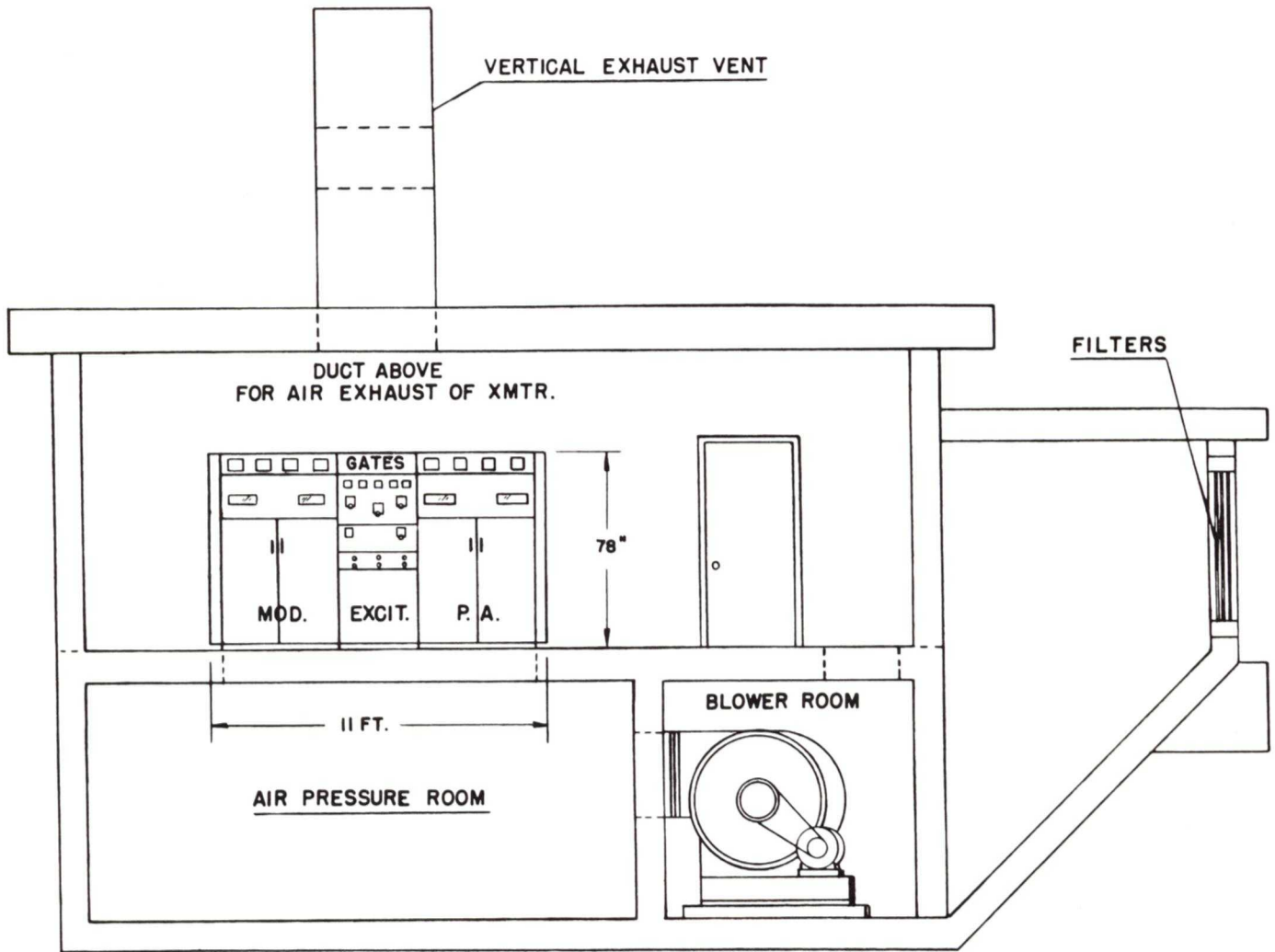
CONSTRUCTION: The HF-50C consists of three main cubicles; audio driver and modulators, RF exciter-driver control cubicle and power amplifier cubicle. All cabinets are accessible from front and rear and vertical construction design permits easy servicing.

RADIO FREQUENCY SECTION: The exciter RF/driver along with associated separate power supplies are built into the center cubicle. Rated at 85 watts output, the exciter has a crystal selection system with 10 positions selectable from the front panel. (Dual exciter units can be provided where desired.) The 3KW driver is continually adjustable and is very conservatively rated which provides reserve power for driving the final amplifier.

POWER AMPLIFIER SYSTEM: The power amplifier uses two Federal Type 6804 forced air cooled tubes in push-pull. Since one tube is capable of delivering 50 KW output, a tremendous reserve of power is available.

AUDIO SYSTEM: All audio stages are located in the modulator cubicle. The 1st audio stage uses two 6146 tubes push-pull. The 2nd audio stage uses two 813 tubes operating as a push-pull amplifier. The audio driver stage uses two 833A triodes operating in a direct coupled cathode follower circuit. Adjustment of bias resistors, feedback and carrier hum are simple. Over-all feedback is approximately 15 db an optimum value for minimum distortion and noise.

HF-50C 50,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER



WITH EXTERNAL BLOWER

MODULATION: Type 6804 tubes used in the PA system are also used as modulators. High level plate modulation is used in the HF-50C transmitter, which provides for a constantly available reserve of audio power. The HF-50C modulator is designed for continuous duty at extremely high levels of average modulation in order to provide for the most possible coverage for this transmitter power.

POWER SUPPLIES: All power supplies in the HF-50C transmitter utilize silicon rectifiers for long trouble-free service throughout a wide range of temperature and humidity. This includes the main high voltage rectifier which provides approximately 10.5 KV plate for the final amplifier and modulator tubes. The use of silicon rectifiers in

the design of the HF-50C has provided a 50 KW HF broadcast transmitter with a minimum space requirement. Separate high voltage plate transformers are used to provide for easier installation and more dependable service.

CONTROL: The HF-50C is provided with a generous supply of overload and under-voltage relays. Every circuit large or small is protected most adequately.

INSTALLATION: The HF-50C has been designed for maximum installation flexibility to fit various situations. It can be supplied with either internal or external blowers to meet your exact installation needs. Gates engineers are available to assist in the installation planning at all times.

HF-50C 50,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

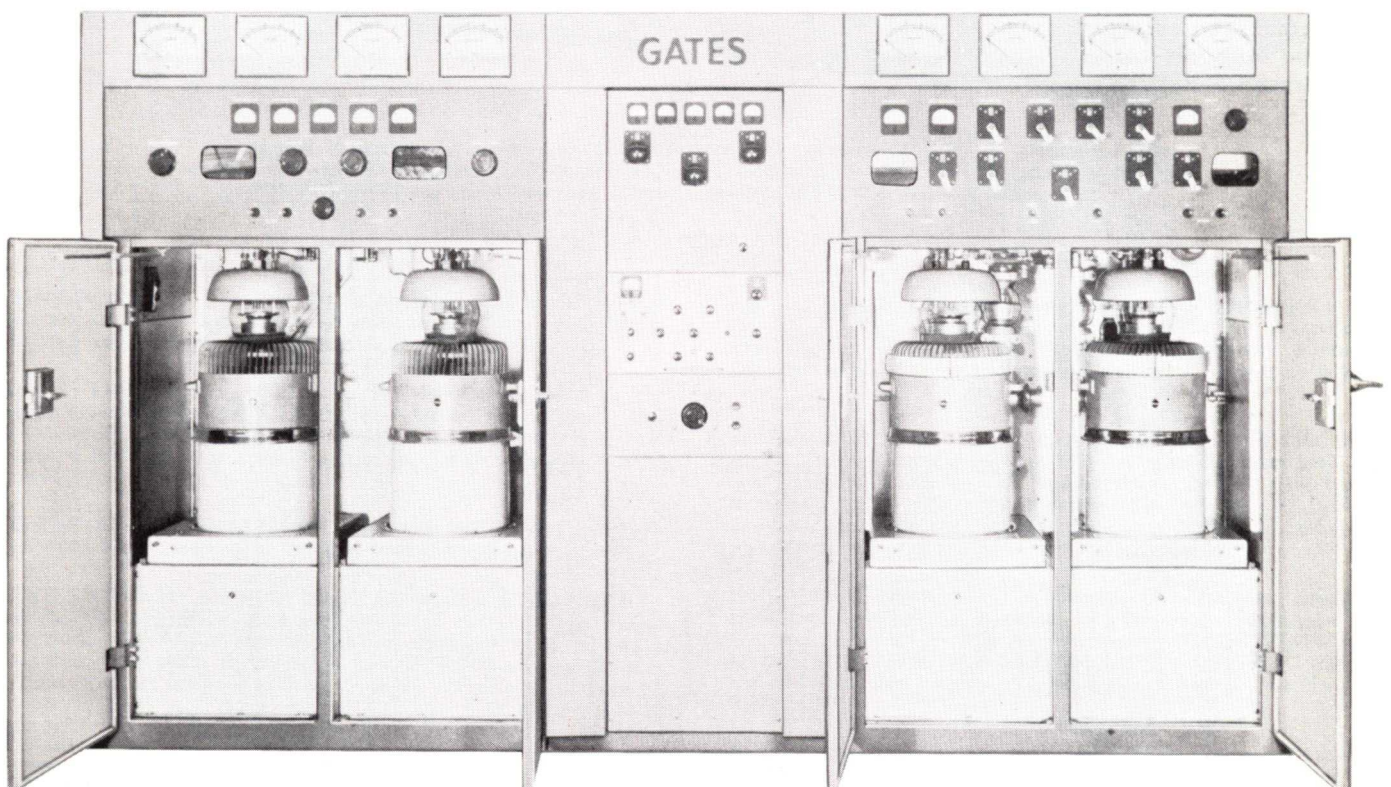
OUTSTANDING FEATURES

INTERNAL OR EXTERNAL BLOWERS: The HF-50C is 100% air cooled with either internal or external blowers. This is a Gates exclusive made possible by very careful and detailed mechanical design. With internal blower arrangements a 3 ft. wide cubicle is added to the right side of the PA cubicle for PA cooling. This increases over-all length to 14 ft. Modulator and driver cubicle have self-contained blowers. No changes in transmitter proper are necessary for external blower arrangement. Air is controlled to insure maximum cooling of all critical areas. Exhaust can be vented out of the building or used for heating in winter.

REGULATION: Filament voltages for the entire transmitter are regulated. This is handled by a Gates three-phase voltage regulator with electronically controlled motor driver transformers keeping filament voltage within $\frac{1}{2}\%$ at all times.

METERING: 14 meters are provided. 8 are located along the top of the power amplifier and modulator cubicle. 5 are located along the upper panel of the exciter RF/driver cubicle. The 14th meter is a multi-meter on the 85 watt exciter unit, which provides for complete metering of the oscillator and RF amplifier stages up to the driver stage. Easy, quick readings can be taken at any time.

BAND SWITCHING: A new concept of plate tank circuit design makes necessary only one adjustment other than from the front panel, to provide for continuous coverage over the range of 4-30 MCS. No plug-in coils are used in the HF-50C transmitter and frequency change can be accomplished in less than five minutes.



HF-50C 50,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

SPECIFICATIONS — ELECTRICAL

POWER OUTPUT: 50,000 watts.

OUTPUT IMPEDANCE: 300-800 ohms balanced.

RF RANGE: 4-30 Mc.

FREQUENCY STABILITY: Capable of .003% or better.

RF HARMONICS: Meets or exceeds FCC requirements.

AUDIO FREQUENCY RESPONSE: 85% modulation
(50-10,000 cycles)
 $\pm 1\frac{1}{2}$ db.

AUDIO HARMONIC DISTORTION: (0.95% modulation from 50 to 7500 cycles) 4% or less.

AUDIO INPUT: 100% modulation sine wave, 400 cps.
+10 dbm.

AUDIO INPUT IMPEDANCE: 600 ohms.

PRIMARY VOLTAGE: 460 volt, 50/60 cycle, 3-phase.

POWER CONSUMPTION: Carrier 90 Kw at 90% PF,
Average Program 100 KW at
90% PF 100% modulation
135 KW at 90% PF.

CARRIER SHIFT: (100% modulation with 400 cps) 5%
or better.

TUBES (RF + Audio)

Exciter Unit (1) 5763, oscillator, (1) 5763 1st buffer, (2) 6146 output, (1) OB2 screen clumper, (1) 6AQ5 screen clumper, (1) 12AU7 keyer, (1) 6AL5 bias rectifier, (2) 5R4GYA rectifier.

RF Driver (1) 6076

Power Amplifier (2) F-6804 push-pull

Modulator (2) F-6804 class "B"

Audio Drivers (2) 833A's cathode follower

Second Audio (2) 813's push-pull

First Audio (2) 6146

TOTAL NUMBER OF TUBES: 21.

TOTAL TUBE TYPES: 13.

SIZE: 6½' high, 11' wide, 5' deep (with external blower)
6½' high, 14' wide, 5' deep (with internal blower)

WEIGHT: 26,850 lbs. packed wt.; cubage 1480 with external blower.

26,859 lbs. packed weight, cubage 1555 with
internal blower.

CRYSTAL: H17 crystal unit JK 02, 6.3 volt A.C., heater oven.

MODULATION CAPABILITY: (30-7500 cycles) 100%.
High level class "B".

RADIO TELEPHONE MODEL:

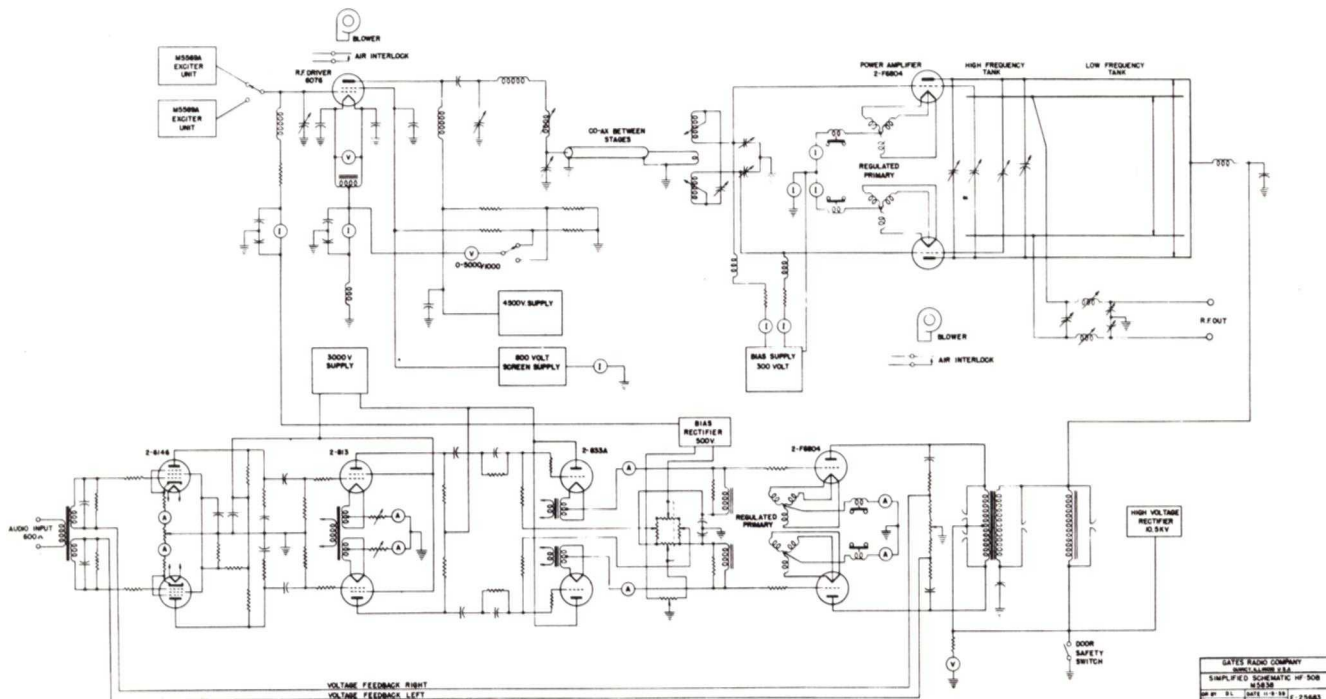
This model is available for radio-telephone service as desired.

RADIO TELEGRAPH MODEL:

The Gates HF-50TX radio-telegraph transmitter is identical to the transmitter described herein except it does not include the modulator cubicle. It is designed for high-speed keying or FSK service. Size is 4 ft. narrower than broadcast model. All other details are the same.

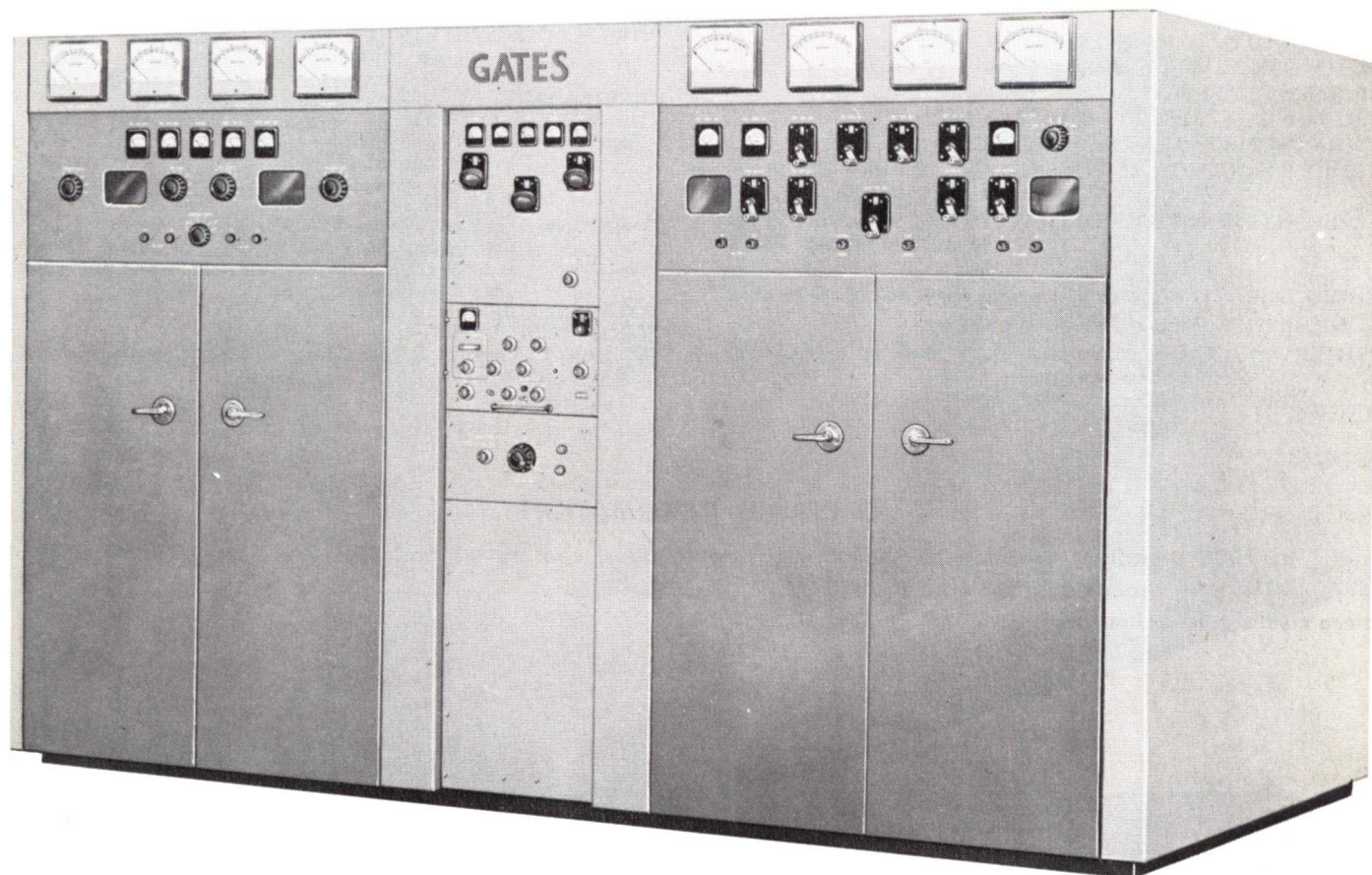
ORDERING INFORMATION

Model HF-50C broadcast transmitter, 50,000 watts, with tubes.....	M-5924
Spare 100% tube complement for above	TK-367
FCC tube complement (required FCC spares)	TK-368
Spare crystal and holder	JKO2C, H-17



100,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

Model HF-100C



Designed to operate in world wide climates under the rigorous demands of continuous duty, the new HF-100C possesses compact size, rapid frequency change, interchangeability of PA and modulator tubes, less tube types, longer tube life, and low power consumption.

CONSTRUCTION: The HF-100C consists of three main cubicles that are accessible from front and rear: audio driver and modulators, RF exciter-driver control cubicle and PA cubicle.

RADIO FREQUENCY SECTION: The RF exciter-driver is the center cubicle and is rated at 85 watts output. Exciter has a crystal selection system with 10 positions selectable from the front panel. 6 KW driver is conservatively rated with plenty of reserve power.

POWER AMPLIFIER SYSTEM: Power amplifier uses two Federal 6804 forced air cooled tubes in push-pull.

AUDIO SYSTEM: All audio stages are located in the modulator cubicle. The 1st audio stage uses two 6146 tubes push-pull. The 2nd audio stage uses two 813 tubes operating as a push-pull amplifier. The audio driver stage uses 5736 triodes operating in a direct coupled cathode follower circuit. Adjustment of bias resistors, feedback and carrier hum are simple. Over-all feedback is approximately 15 db an optimum value for minimum distortion and noise.

MODULATION: Type F6804 tubes used in the power amplifier

are also used as modulators. High level plate modulation is used in the HF-100C transmitter, which provides for a constantly available reserve audio-power. The HF-100C modulator is designed for continuous duty at extremely high levels of average modulation.

POWER SUPPLIES: All power supplies in the HF-100C transmitter utilize silicon rectifiers. This includes the main high voltage rectifiers which provide approximately 15 KV plate for the modulator tubes and approximately 12.5 KV on the final RF amplifier. Separate high voltage plate transformers for modulator and RF amplifier are used.

BAND SWITCHING: A new concept of plate tank circuit design makes necessary a minimum of adjustments other than from the front panel, to provide for continuous coverage over the range of 4-30 MCS. No plug-in coils are used in the HF-100C transmitter and frequency change can be accomplished in less than five minutes.

CONTROL: The HF-100C is provided with a generous supply of overload and under-voltage relays. Every circuit large or small is protected most adequately.

HF-100C 100,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

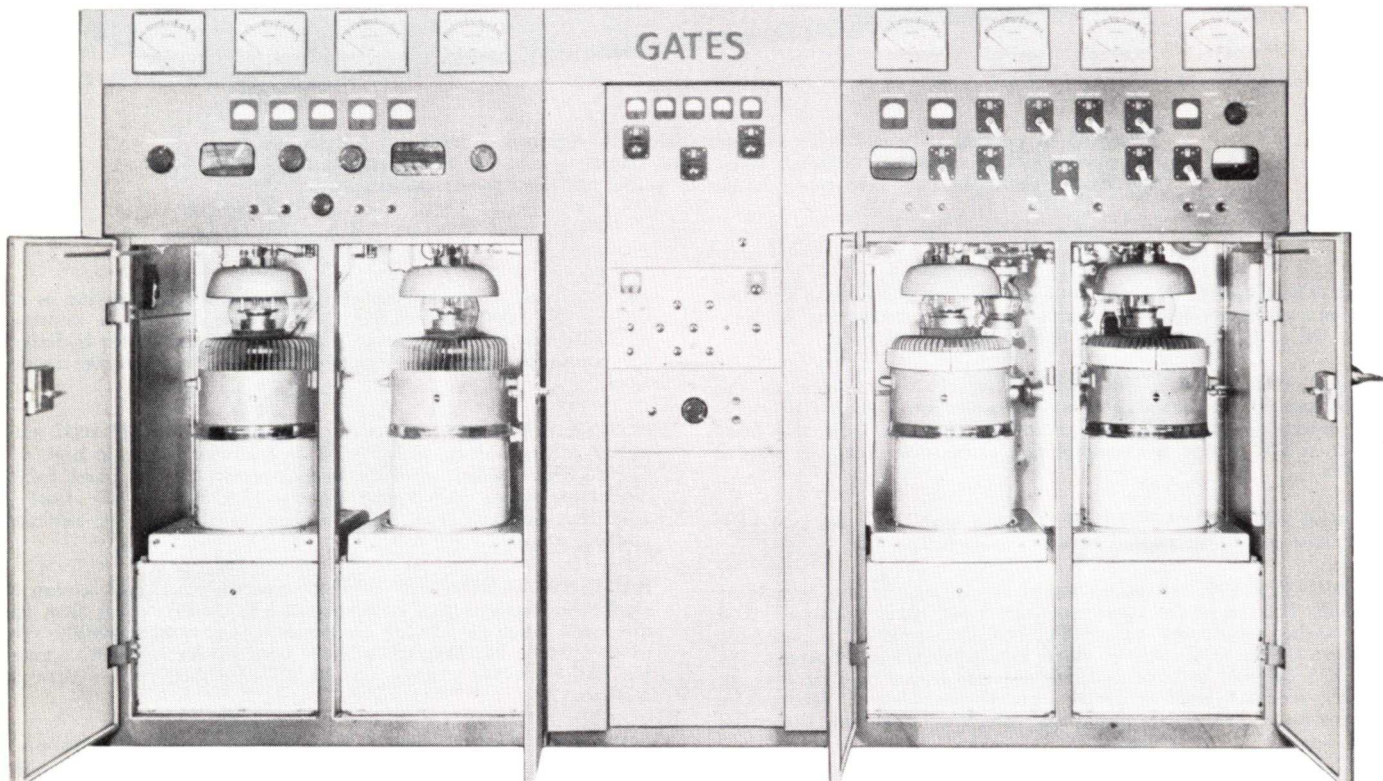
SPECIFICATIONS

POWER OUTPUT: 100,000 watts.
 OUTPUT IMPEDANCE: 300-800 ohms.
 RF RANGE: 4-30 MC.
 FREQUENCY STABILITY: 0.03% or better.
 RF HARMONICS: Meets or exceeds FCC requirements.
 AUDIO FREQUENCY RESPONSE: 85% modulation (50-10,000 cycles) $\pm 1\frac{1}{2}$ db.
 AUDIO HARMONIC DISTORTION: (0-95% modulation from 50 to 7500 cycles) 4% or less.
 AUDIO INPUT: 100% modulation sine wave, 400 cps +10 dbm.
 AUDIO INPUT IMPEDANCE: 600 ohms.
 PRIMARY VOLTAGE: 460 volt $\pm 5\%$, 3 phase, 50 or 60 cycles as specified.

POWER CONSUMPTION: Carrier 157 KW.
 Average Program 173 KW.
 100% Modulation 255 KW.
 CARRIER SHIFT: (100% modulation with 400 cps) 5% or less.
 TUBES (RF & AUDIO):
 Exciter Unit: (1) 5763 oscillator, (1) 5763 second buffer, (2) 6146 output, (1) OB2 screen clamper, (1) 6AQ5 screen clamper, (1) 12AU7 keyer, (1) 6AL5 bias rectifier, (2) 5R4GYA rectifiers.
 RF Driver: (2) 6076 Power Amplifier, (2) F6804 push-pull. Modulators; (2) F6804 class "B". Audio Drivers; (2) WL5736 cathode follower. Second audio; (2) 813's push-pull. First audio; (2) 6146.
 TOTAL NUMBER OF TUBES: 22.
 TOTAL TUBE TYPES: 13.
 SIZE: 6½ ft. high, 14 ft. wide, 5 ft. deep with external blower.
 CUBAGE: 1555.

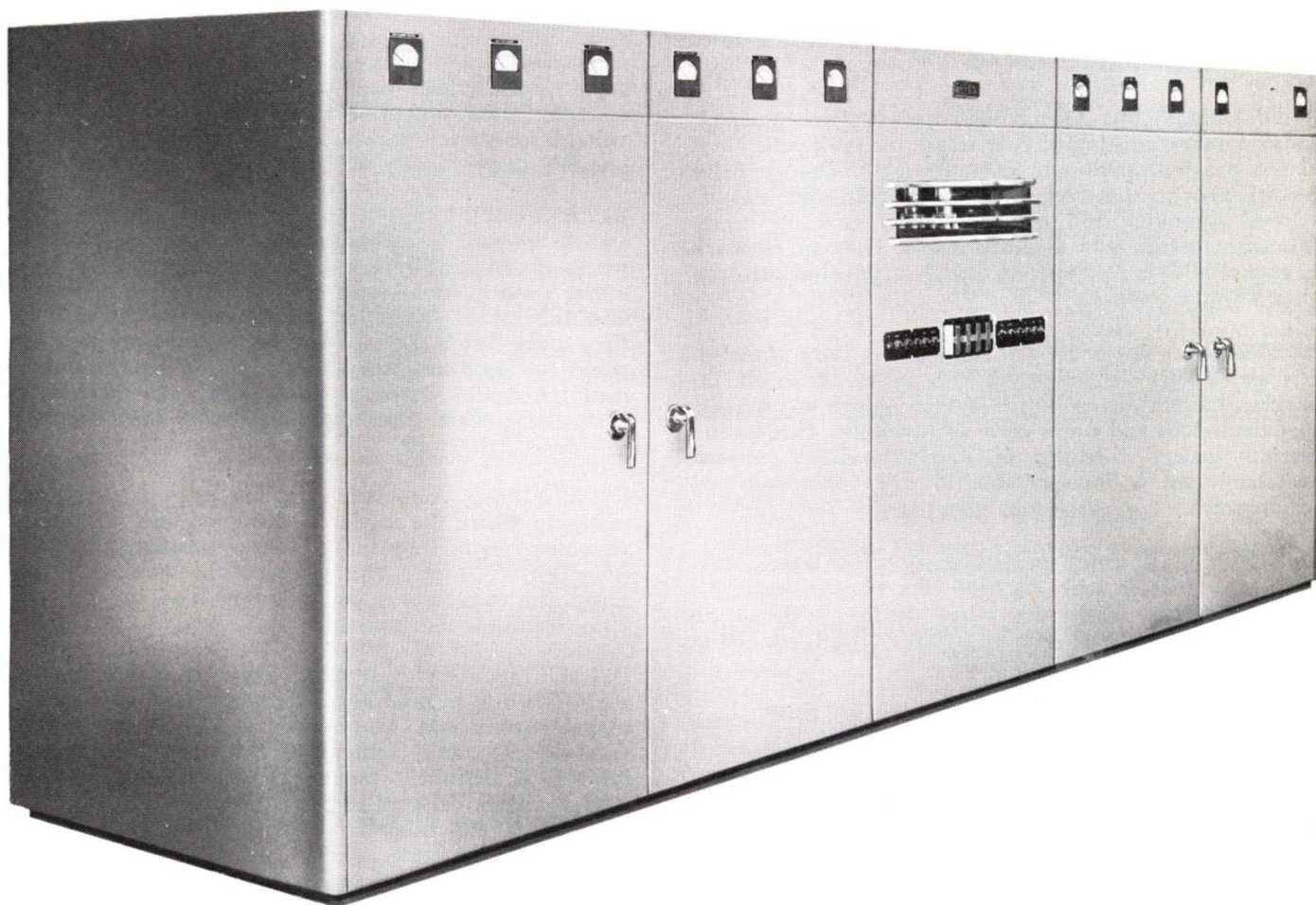
ORDERING INFORMATION

Model HF-100C broadcast transmitter, 100,000 watts, with tubes, one crystal and oven	M-5966
Spare 100% tube complement for above	TK-376
Spare crystal and holder	JKO2-H17



20,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

Model HF-20B



Now in service around the world in such places as Indonesia, Siam, Israel, Nigeria, Viet Nam, the Dominican Republic and many other countries, providing reliable service in the international broadcast and communication bands is the Gates HF-20B 20,000 watt high frequency broadcast transmitter. The HF-20B covers the entire frequency range between 4-22 Mc. An additional set of frequency determining components is available where frequencies down to 2 MC are desired. With two other models available for telegraph (HF-20TX) and radio telephone transmission (HF-20CX) all models are basically the same as pictured above except the HF-20TX which has no modulator cubicle and therefore only four cabinets.

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 0.003% 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. RF drive to the final is in abundance by use of push-pull 4-250A tetrodes. In the final power amplifier, four 3X2500F3 tungsten filament tubes are operated in push-pull parallel.

FREQUENCY AND 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 coils may be changed in less than a minute and coils are supplied for all 4-22 frequencies. Veeder counters reading to 1/10 turn permit accuracy logging of all tuned circuits for quick frequency change.

OUTPUT COUPLING: RF impedance between 300-800 ohms are matched by means of inductive coupling to

HF-20B 20,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

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 stages, all push-pull. Modulators are four push-pull 3X300F3 tubes. Though drive requirements to these tubes are low, Gates engineers developed a unique and highly effective coupling transformer to greatly add to performance. Over-all feedback is employed as an adjunct to excellent possible performance without feedback.

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 drive 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 biased that when the key is closed, no current is drawn. Keying up to 400 WPM with essentially square top wave form is obtained.

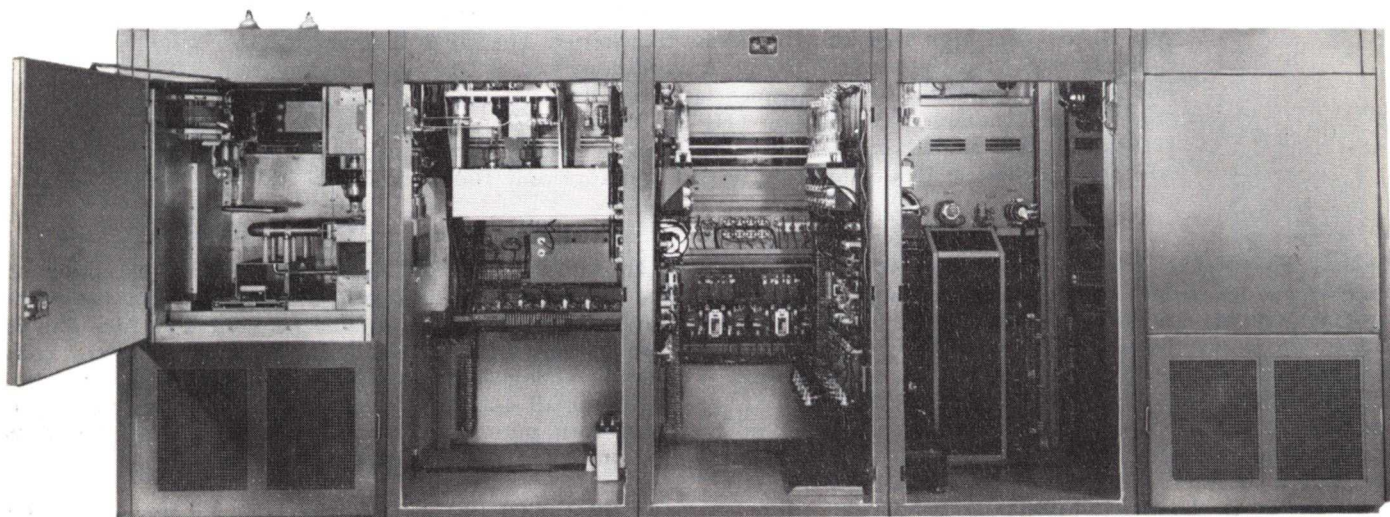
POWER SUPPLIES: Five major power supplies deliver plate and bias voltage to the HF-20B transmitter. Featured are the two separate and complete high voltage supplies. One is used for the radio frequency power amplifier and the other for the modulators. The resulting almost perfect regulation is quickly recognized by the engineer. Like-

wise, in case of failure of one power supply, the remaining one can be bussed in, operating the transmitter on reduced power until repairs are made. Each of these two main 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: Primary magnetic breakers are inserted in all main primary lines. Individual supervisory overload relays are incorporated for the transmitter main overload, and for full protection against exciter failure, air failure, and for 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-20B to be the finest. The long list of users includes major governments world-wide as well as international transoceanic radio communications and press services. HF-20B is definitely commercial all the way. Whether used 24 hours daily or in remote equatorial climate with temperature and humidity high, performance and reliability can be expected.



HF-20B 20,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

SPECIFICATIONS

POWER OUTPUT: 4-18 Mc, 20,000 watts. 18-22 Mc, 16,000 watts.
OUTPUT IMPEDANCE: 300-800 ohms balanced. Where 50 ohms unbalanced, so state when ordering.
FREQUENCY RANGE: 4-22 Mc as supplied. Frequency determining kit for 2-4 Mc available where required.
RF STABILITY: 0.003% or better.
RF HARMONICS: Suppression of harmonics meets or exceeds FCC requirements.
POWER REDUCTION: Low power tune-up switch provided.
AUDIO RESPONSE: $\pm 1\frac{1}{2}$ db 50-10,000 cycles.
DISTORTION: *4% or less 50-7500 cycles.
AUDIO INPUT LEVEL: +10 dbm ± 2 db for 100% modulation.
AUDIO INPUT IMPEDANCE: 600 ohms normal, (multi-impedance input transformer)
PRIMARY VOLTAGE: 230 volts, 3 phase, 50/60 cycles. Other primary voltages or line frequencies available on special order.
POWER CONSUMPTION: 0 Modulation 37 Kw, telegraph, 34 Kw. Average modulation, 43 Kw. 100% modulation (sine wave) 55 Kw.
CARRIER SHIFT: 5% or less.

TUBES:

Radio frequency section —

6AG7 oscillator, 6AG7 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) 3X3000F1.

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

SIZE: HF-20B and HF-20BX, 210" wide, 49" deep, 78" high. Door swing, 40" front and rear. Floor space external units, 10' x 2 $\frac{1}{2}$ ".

HF-20TX, 175" wide, 49" deep, 78" high. Door swing, 40" front and rear. Floor space external units, 4' x 2 $\frac{1}{2}$ ".

WEIGHT: HF-20B and HF-20BX — 17,500 lbs. packed, 14,000 lbs. net. HF-20TX — 14,000 lbs. packed, 11,500 lbs. net.

CUBAGE: HF-20B and HF-20BX — 1100 cu. ft. HF-20TX — 900 cu. ft.

FINISH: Medium gray.

NOISE: *55 db below 100% modulation or better.

CRYSTAL POSITIONS: Four with connection to FSK or external oscillator.

KEYING: **400 WPM with essential square top wave form, on-off keying.

* Modulated models only.

** HF-20BX, and HF-20TX only.

METERS: RF output — (2), 2nd IPA cathode, (2) plate volts, (2) filament volts, line volts, osc. cathode, 1st IPA cathode, 2nd IPA grid, 2nd IPA cathode, 3rd IPA grid, 3rd IPA cathode, PA grid (2 meters), PA plate (4 meters), 1st audio cathode, 2nd audio cathode, 3rd audio cathode (2) modulators and total PA current and total modulator current.
 * Modulated models only.

EQUIPMENT SUPPLIED AS STANDARD: 1 complete transmitter type as ordered.

1 100% set of tubes

2 instruction books

ORDERING INFORMATION

Model HF-20B high frequency, high fidelity broadcast transmitter, 4-22 Mc, complete with all coils and one set of tubes

60 cys. M-4748
50 cys. M-4748A

Model HF-20TX high frequency, telegraph transmitter 4-22 Mc, complete with all coils and one set of tubes

60 cys. M-4780
50 cys. M-4780A

NOTE: The HF-20TX is basically the same as the HF-20B

NOTE: except it has no modulator cubicle and there-

NOTE: fore only four cabinets.

Model HF-20BX high frequency, high fidelity broadcast transmitter, with 400 WPM keyer 4-22 Mc, complete with all coils and one set of tubes

60 cys. M-4778
50 cys. M-4778A

Crystal and holder (state frequency)

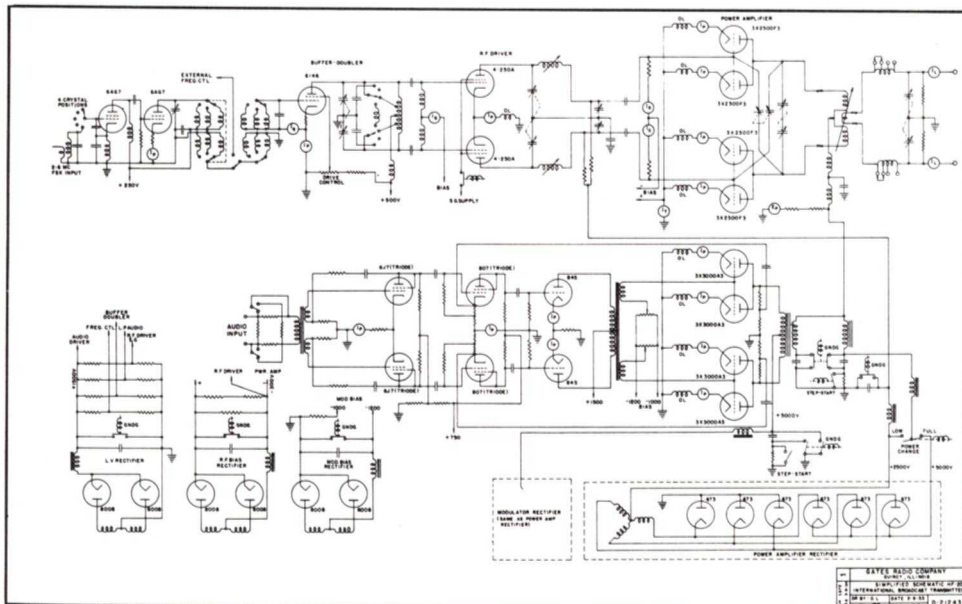
JK03, H-17

Spare 100% tube complement for HF-20B and HF-20BX transmitters

TK-139

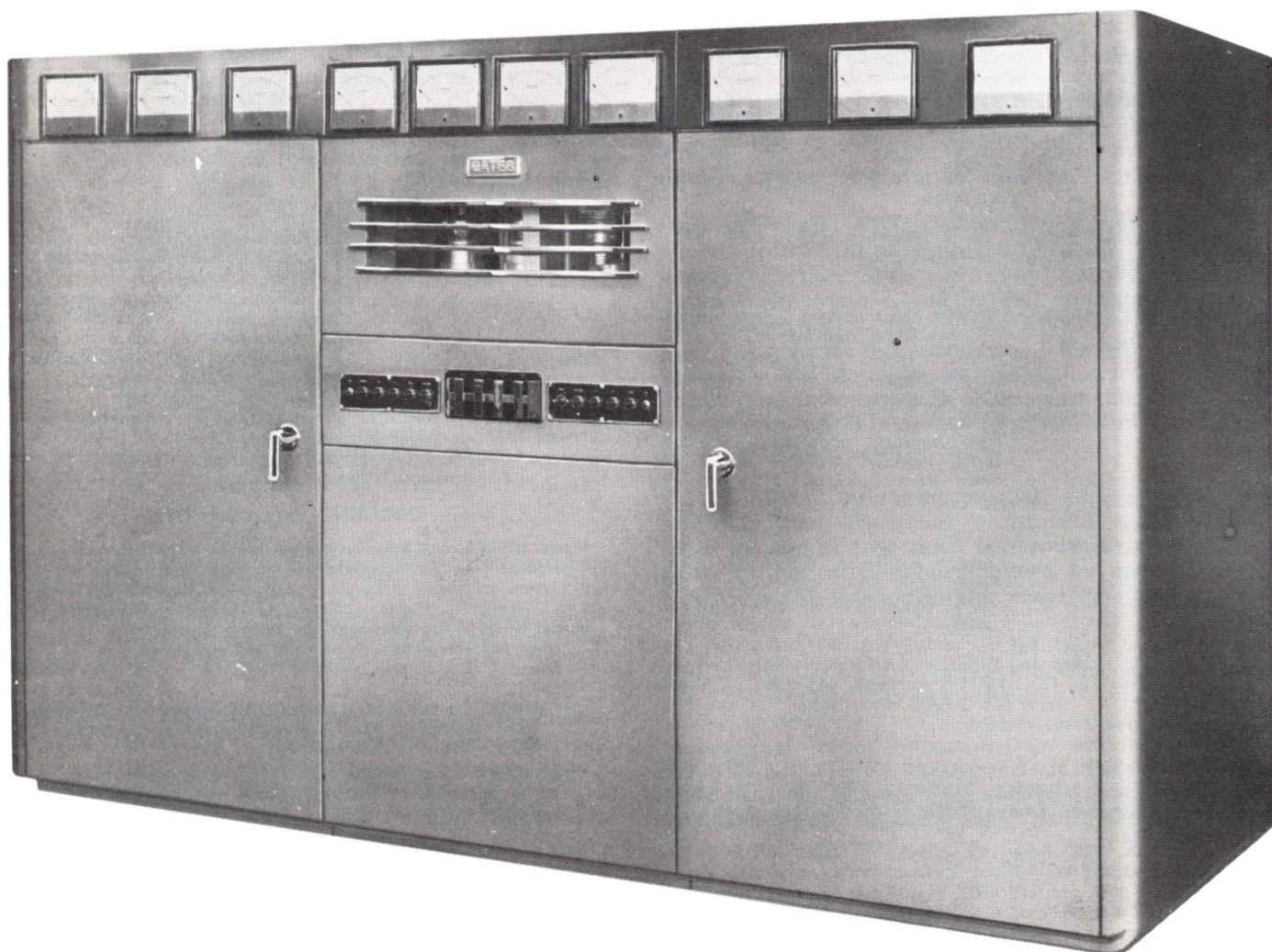
Spare 100% tube complement for HF-20TX transmitter

TK-140



10,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

Model HF-10B



Renowned for reliable short wave broadcasting the world over, the HF-10B provides 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. These transmitters use 3X2500F3 tubes with thoriated tungsten filaments in both power amplifier and modulator sockets. Carrier frequency change may be made in seconds by continuously variable tuning and "latch on" take coil assemblies. New tube complement gives lower cost — longer life. Electronically modern and rugged, Gates Engineers have incorporated walk-in construction for easy servicing.

MODELS AVAILABLE: Variations of the HF-10B are listed under Ordering Nomenclature.

BAND CHANGING is quick and effective. All circuits are continuously variable and tuned from the front panel with the 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 to cover the range from 2-22 Mc. Output 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. Sepa-

HF-10B 10,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

rate 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.

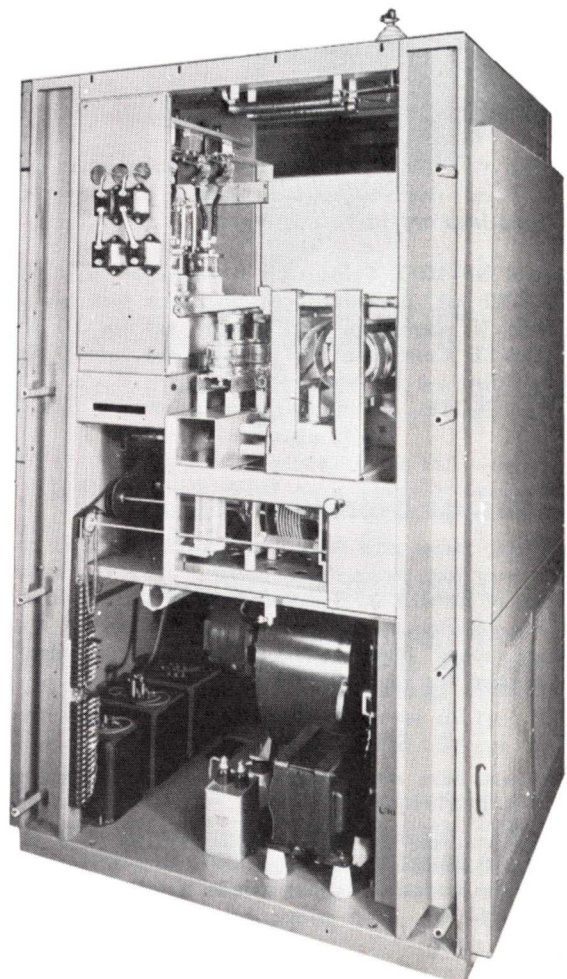
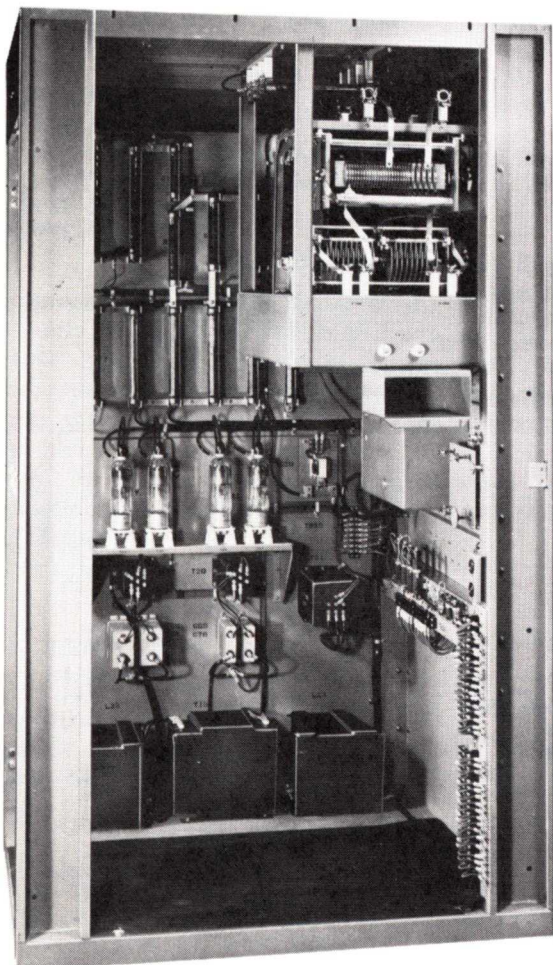
RECYCLING is part of the HF-10B transmitter design. If, for any reason, the carrier should go off the air, the transmitter will automatically try to turn itself back on four times. Thus in case of a static discharge across the transmission line, for example, the transmitter will automatically turn back 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 dia-

phragm pressure switch. An additional small blower feeds a small stream of air on the base of each high voltage mercury vapor rectifier 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.

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 door 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 cards or soldering iron are standard equipment. Floor space for the three cubicles or entire transmitter is 125" wide and 49" deep, exclusive of floor swing. Power transformer, modulator transformer, and reactor are mounted externally.



HF-10B 10,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

SPECIFICATIONS

POWER OUTPUT: Model HF-10 (all models) 10,000 watts.
NOTE: Power output above 18 Mc. will be slightly lower.
OUTPUT IMPEDANCE: 300-800 ohms balanced.
FREQUENCY RANGE: 2-22 Mc. 4-30 Mc. on special order.
FREQUENCY STABILITY: 0.003%.
RF HARMONICS: Meets or exceeds FCC requirements.
FREQUENCY RESPONSE: Plus or minus 1.5 db, 30-10,000 cycles broadcast model; plus or minus 3 db, 150-4000 cycles communications model.
AUDIO INPUT: +17 dbm, ± 2 db.
AUDIO INPUT IMPEDANCE: 600 ohms normal; (multi impedance input transformer).
PRIMARY VOLTAGE: 230 volts, 3 wire 50/60 cycles, 3 phase.
POWER CONSUMPTION: 100% Modulation — 30 Kw.
POWER CONSUMPTION: Average Modulation — 23 Kw.
POWER CONSUMPTION: PL Demand Carrier — 21 Kw.
CARRIER SHIFT: 5% or less at 100% modulation.
TUBES: (all models).
 (2) 6AG7, (2) 4-125A, (2) 6J7, (4) 845, (4) 3X2500F3, (4) 8008, (6) 673, (3) 807.
TOTAL NUMBER OF TUBES: 27.
TOTAL TUBE TYPES: 8.

SIZE: 125" long, 78" high, 49" deep, with door swing front, 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: 5,000 lbs.
GROSS WEIGHT: 7,000 lbs.
CUBAGE: 485 cu. ft.
FINISH: Medium gray.
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.)
NOISE: 60 db or better below 100% modulation, broadcast model; 45 db or better below 100% modulation, communications model.
KEYING SPEED: 400 WPM with pure square top wave form. Higher practical keying speeds up to 600 WPM easily possible.
CRYSTAL POSITIONS: 4 (additional crystal provisions available on special order).

ORDERING INFORMATION

Model HF-10B 10 Kw broadcast transmitter with all coils 2-22 mc, one set of tubes, less crystals and ovens	60 cys. M-3787 50 cys. M-3787A
Model HF-10BX 10 Kw broadcast transmitter with electronic keyer added, with tubes, complete coil set 2-22 mc, one set of tubes but less crystals and ovens	60 cys. M-3789 50 cys. M-3789A
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	60 cys. M-3791 50 cys. M-3791A
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	60 cys. M-3793 50 cys. M-3793A
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	TK-255
HFTSX-10 Complete 100% tube set for 10 Kw telegraph models	TK-255
HFTSB-10 Complete 100% tube set for 10 Kw telephone models	TK-253
HFK Tube set for electronic keyer	TK-256

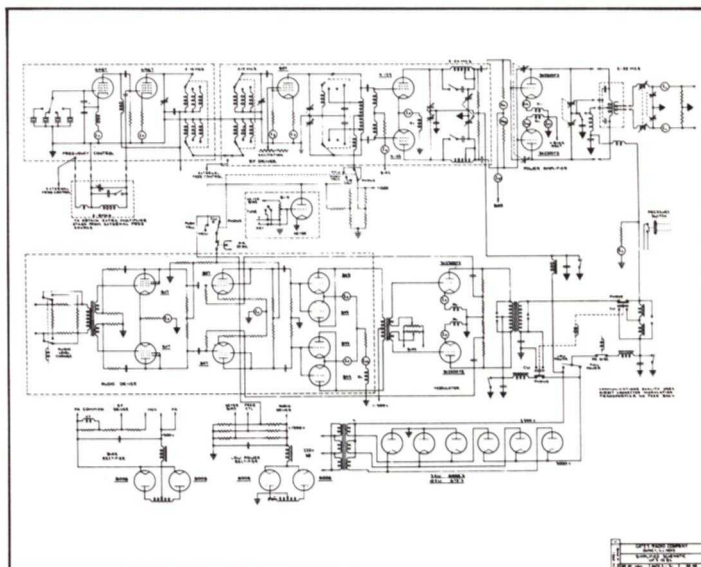
NOTE: All models available in a 4-30 Mc version on special order.

SPECIAL 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.



10,000 WATT HIGH FREQUENCY TELEGRAPH TRANSMITTER

Model HF-10TX



For telegraphic transmission, Gates offers the HF-10TX electronically keyed, 10,000 watt high frequency telegraph transmitter operating over a frequency range of 2-22 or 4-30 mc. Operated by international radio communication and press services at Tangier, Montevideo, Centerreach, England and other major centers, the HF-10TX is well known for its reliable operation under all kinds of climatic conditions. The HF-10TX is similar in construction to the HF-10B.

SPECIFICATIONS

POWER OUTPUT: 10,000 watts.
OUTPUT IMPEDANCE: 300-800 ohms balanced line. (Other impedances in special line on order.)
FREQUENCY RANGE: 2-22 mc or 4-30 mc.
FREQUENCY STABILITY: ± 21 cycles at 3 mc.
RF HARMONICS: Suppression of harmonics meets or exceeds FCC requirements.
POWER SOURCE: 230 volt, 3 phase, 50/60 cycles. (Other voltages and frequencies on special order.)
TUBES: Oscillator - (1) 6AG7; Buffer-Doubler - (1) 807; Keyer - (1) 811-A; R.F. Driver - (2) 4-125A; PA - (2) 3X2500 F3; Bias Rectifier - (2) 8008; LV Rectifier - (2) 8008; HV Rectifier - (6) 8008; Buffer - (1) 6AG7.
TOTAL NUMBER TUBES: 18.
TOTAL TUBE TYPES: 7.

DIMENSIONS: 125" long, 48 $\frac{1}{2}$ " deep, 78" high.
NET WEIGHT: 4000 lbs. Export packed, 6500 lbs.
CUBAGE (export): 450 cu. ft.

CRYSTAL FREQUENCY: 2-11 mcs or 2-7.5 mcs doubling in frequency control unit with Janes Knight JKO-3.

CRYSTAL POSITION: 4, external osc. or FSK unit.

KEYING SPEED: 400 WPM with essential square top wave form. High practical keying speeds up to 600 WPM possible.

ORDERING INFORMATION

Model HF-10TX telegraph transmitter, 10,000 watts with complete coil set 2-22 Mc complete set of tubes, less crystals and ovens, but with high speed electronic keyer 60 cys. M-3795
 50 cys. M-3795A

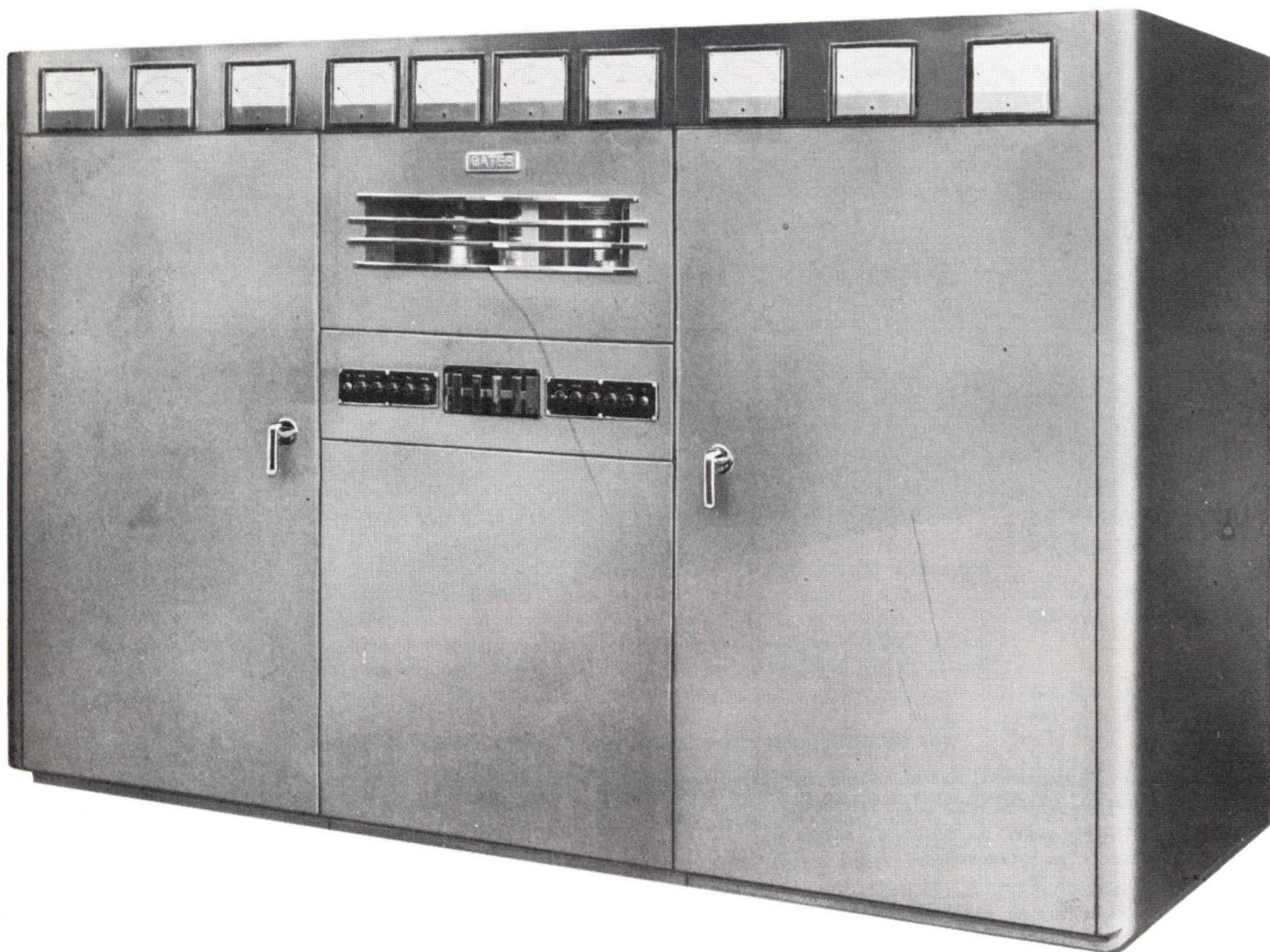
Spare 100% tube complement for aboveTK-255

Model HF-5TX, same as above except 5,000 watts output complete coil set 2-22 Mc high speed electronic keyer, complete set of tubes but less crystals and ovens60 cys. M-3794
 50 cys. M-3794A

Spare 100% tube complement for aboveTK-254

5000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

Model HF-5B



A companion to the HF-10B, the HF-5B 5000 watt high-frequency broadcast transmitter operates at 5000 watts with high level modulation from 2-22 mc. Audio frequency response is uniform within 2 db from 30 to 10,000 cycles. Famous 3X2500F3 tubes with thoriated tungsten filaments are used in both power amplifier and modulator sockets.

A superior transmitter with an excellent global reputation, the HF-5B is rugged, easy to service and gives top performance under rigorous duty in every type of climate.

HF-5B 5000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

SPECIFICATIONS

POWER OUTPUT: Model HF-5 (all models), 5000 watts.
 OUTPUT IMPEDANCE: 300-800 ohms balanced.
 FREQUENCY RANGE: 2-22 mc.
 FREQUENCY STABILITY: .003%.
 RF HARMONICS: Suppression of harmonics meets or exceeds FCC requirements.
 AUDIO FREQUENCY RESPONSE: +1.5 db, 30-10,000 cycles broadcast model, +3 db 1500-4000 cycles communications model.
 AUDIO HARMONIC DISTORTION: 3% or less between 50 and 7500 cycles for broadcast model; 10% or less between frequencies of 150-4000 cycles for communication model.
 AUDIO INPUT: +14 dbm ± 2 db.
 AUDIO INPUT IMPEDANCE: 600 ohms normal (multi-impedance input transformer).
 PRIMARY VOLTAGE: 230 volts, 3 wire, 50/60 cycles, 3 phase.
 POWER CONSUMPTION AT 100% MODULATION: HF-5B, HF-5BX, HF-5C, HF-5CX, approx. 19.5-KW; HF-5TX, 10-KW.
 CARRIER SHIFT: 5% or less at 100% modulation.

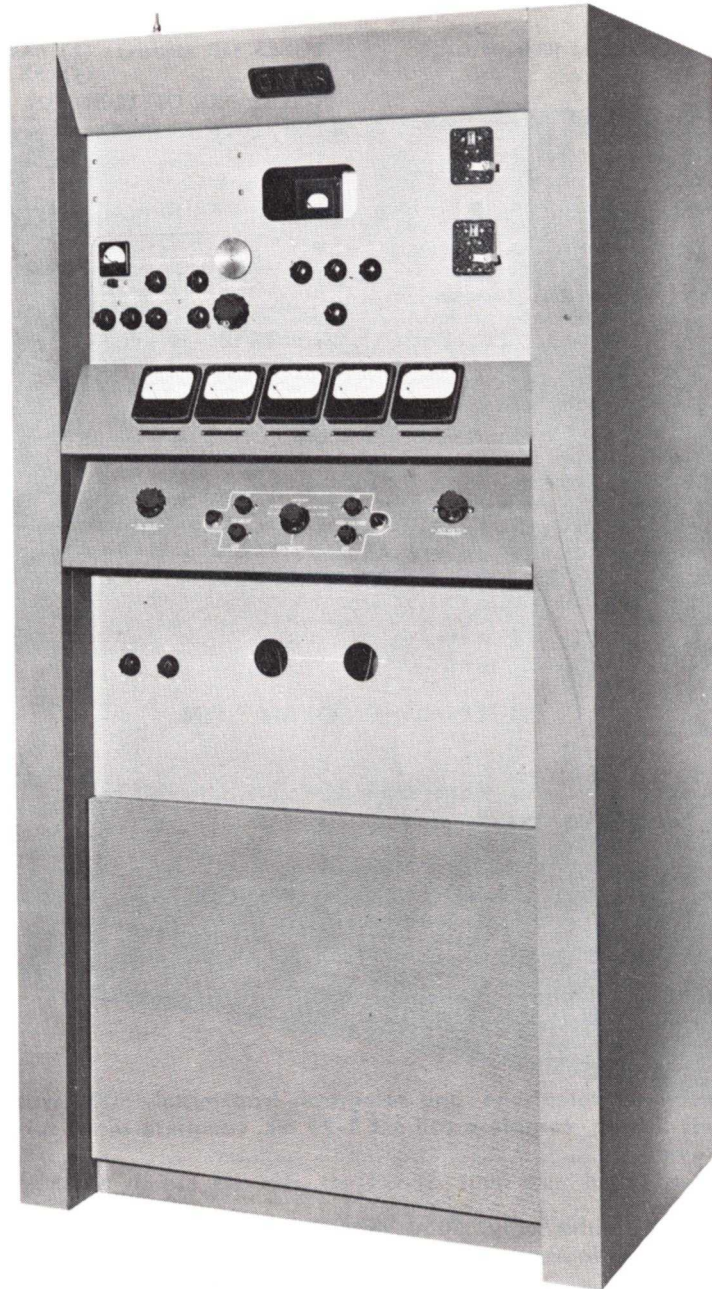
TUBES (all models): (2) 6AG7, (2) 4-125A, (2) 6J7, (4) 845, (4) 3X2500F3, (10) 8008, (3) 807.
 TOTAL NO. OF TUBES: 27.
 TOTAL TUBE TYPES: 7.
 SIZE: 125" long, 78" high, 49" deep, with door swing front and back doors 40".
 NET WEIGHT: 8,400 lbs.
 GROSS WEIGHT:
 HF-5B with dry type transformers:
 NET WEIGHT — 6,620 lbs.
 EXPORT PACKED — 10,220 lbs.
 HF-5B with oil filled external components:
 NET WEIGHT — 8,400 lbs.
 EXPORT PACGED — 12,000 lbs.
 CUBAGE: 475 cu. ft.
 FINISH: Medium gray.
 CRYSTAL POSITIONS: 4.
 NOISE: 60 db or better below 100% modulation, broadcast model; 45 db or better below 100% modulation, communications model.
 KEYING SPEED: 400 WPM with square top wave form. Speeds to 600 WPM possible.

ORDERING INFORMATION

Model HF-5B high frequency broadcast transmitter with complete coil set 2-22 mc, one set of tubes, less crystals and ovens	60 cys. M-3786 50 cys. M-3786A
Model HF-5BX, same as above but with electronic keyer added, with tubes complete coil set 2-22 mc, less crystals and ovens	60 cys. M-3788 50 cys. M-3788A
Model HF-5C communications telephone transmitter, 5000 watts, with coil set 2-22 mc, one set of tubes but less crystals and ovens	60 cys. M-3790 50 cys. M-3790A
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	60 cys. M-3792 50 cys. M-3792A
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	60 cys. M-3794 50 cys. M-3794A
Crystal and oven ready to use with any of above transmitters.	
Specify carrier frequency desired when ordering (HFXT-1)	M-3796
Complete 100% tube set for 5-KW telephone models (HFTSB-5)	TK-252
Complete 100% tube set for 5-KW telegraph models (HF-TXB-5)	TK-254
Tube set for electronic keyer	HFK

1,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

Model HF-1M



The HF-1M Transmitter supplies 1000 watts output power that may be 100% modulated for either communications or broadcast. Powers in excess of 1KW output are possible when keyed. With high frequency coverage from 2 & 32 mc, coverage between 3 & 32 mc is continuously variable from the front panel, by adjusting dial settings — no component changes necessary. HF-1M is an all purpose transmitter. All modulation components are of broadcast quality. Where the wide audio range of broadcasting is not desired, the Gates limiter/filter amplifier is added

for communication quality. Manual keying up to 60 WPM including break-in may be augmented with an optional electronic keyer for speeds up to 400 WPM.

Heart of the HF-1M is the M-5239 exciter that accommodates 10 crystals in open holders (0.02% accuracy) or in temperature controlled ovens (.003% accuracy). Completely self-contained including metering, this exciter delivers up to 85 W output to drive the final power amplifier directly. Entire tune-up of the transmitter to the

HF-1M 1,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

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: 5763 oscillator, 5763 amp. doubler and (2) 6146 output. A 6AQ5 screen clamper and OB2 regulator tube is also employed. Keying or break-in is optional three ways: (1) oscillator cathode only, (2) IPA cathode only, or (3) both.

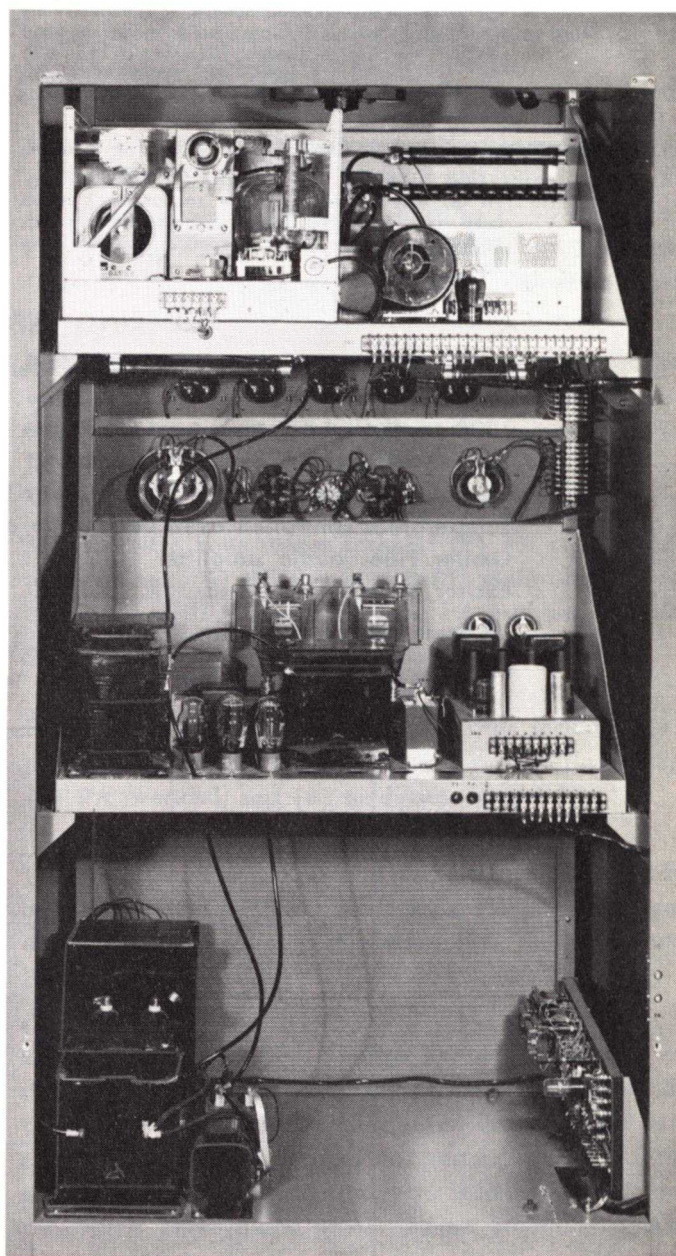
Continuously variable rotating coils ganged for one dial operation, tune the PA stage from 3-32 Mc. Where operation is below 3 Mc a padder is added. For quicker tuning a low power tune-up switch has been incorporated to allow the operator to check exact resonance before applying full power. The HF-1M uses a single 4-1000A power tube in the final amplifier. This tube rating is actually capable of over 1500 watts output which means long life at 1000 watts.

OUTSTANDING FEATURES

1. Continuously variable by front panel control 3-32 mc, a padder is added where 2 mc is desired.
2. Audio system either for broadcast or voice. When voice only, use with M-5263 limiter/filter amplifier.
3. Complete relay system for complete protection 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.
4. High level class B modulation with twin-drive audio for full reliability, low distortion and long tube life with 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 the entire transmitter. RF and audio decks instantly removable to clean or service. Blower and suction fan assures excellent cooling of all components.

REAR VIEW



HF-1M 1,000 WATT HIGH FREQUENCY BROADCAST TRANSMITTER

SPECIFICATIONS

POWER OUTPUT: 1000 watts, 100% modulated, 2-26 mc. 800 watts, 100% modulated, 26-32 mc.

RF OUTPUT IMPEDANCE: 51.5 ohms. Where other output impedances are desired, special coupling units are available to match customer requirements.

RF RANGE: 2-32 mc. Continuously variable by front panel tuning. Padder added for 2 mc operation.

RF STABILITY: Where used with JKO-2 temp. controlled oven, .003%. Where used with H-7 holder. 0.02%.

RF HARMONICS: Suppression of harmonics meets or exceeds FCC requirements.

AUDIO FREQUENCY RESPONSE: As broadcast transmitter ± 2 db 50-7500 cycles. $\pm 2\frac{1}{2}$ db 30-10,000 cycles. As communications transmitter (when used with M-5263 limiter/filter amplifier) $\pm 2\frac{1}{2}$ db 200-2500 cycles with sharp cut-off above 2500 cycles.

AUDIO HARMONIC DISTORTION: $3\frac{1}{2}\%$ or less 50-7500 cycles at 95% modulation.

AUDIO INPUT: 10 db ± 2 db as broadcast transmitter. When used with M-5263 limiter/filter amplifier, input is for either low level microphone or 600 ohm line.

AUDIO INPUT IMPEDANCE: 150, 250 or 600 ohms.

PRIMARY VOLTAGE: 230 volts single phase 50/60 cycles.

POWER CONSUMPTION: Consumption at 0% modulation or CW, 3200 W. At average modulation, 4500 W.

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

TUBES: (Radio frequency) 5763 osc., 5763 amp. doubler, (2) 6146 drivers, 4-1000A power amplifier, OB2 regulator (2) 6Y6G clampers (audio), (2) 6SN7 input, (4) 1622/6L6G drivers (2) 833A modulators. Power supplies (4) 5R4GY, (2) 8008, (1) 6AQ5 clamper.

TOTAL NUMBER OF TUBES: 23.

TOTAL TUBE TYPES: 10.

TYPE OF OUTPUT: Single ended, full Tee network.

NUMBER OF CRYSTALS: Ten crystal positions. Where JKO-2 temperature controlled oven is used. 2 crystals 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.

MODULATION: High level Class B.

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 thru grill intake at bottom front.

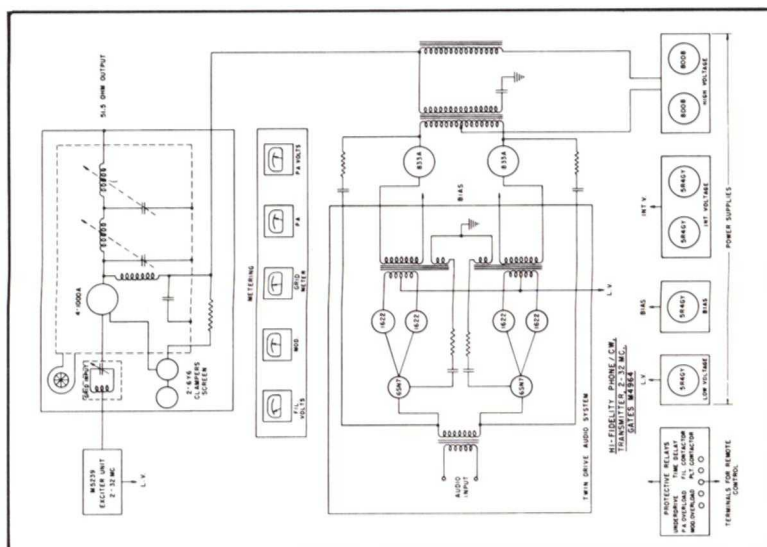
ORDERING INFORMATION

Model HF-1M High Frequency Transmitter complete w/one set

tubes, less crystals	M-4964
100% spare tube complement for above	TK-259
Crystal and holder for 0.02% accuracy*	H-7
Crystal and holder for 0.003% accuracy (mounts in JKO-2 oven)**	H-17
Temperature controlled oven (holds one or two H-17)	JKO-2
Limiter/Filter audio amplifier	M-5263
Exciter only	M-5239

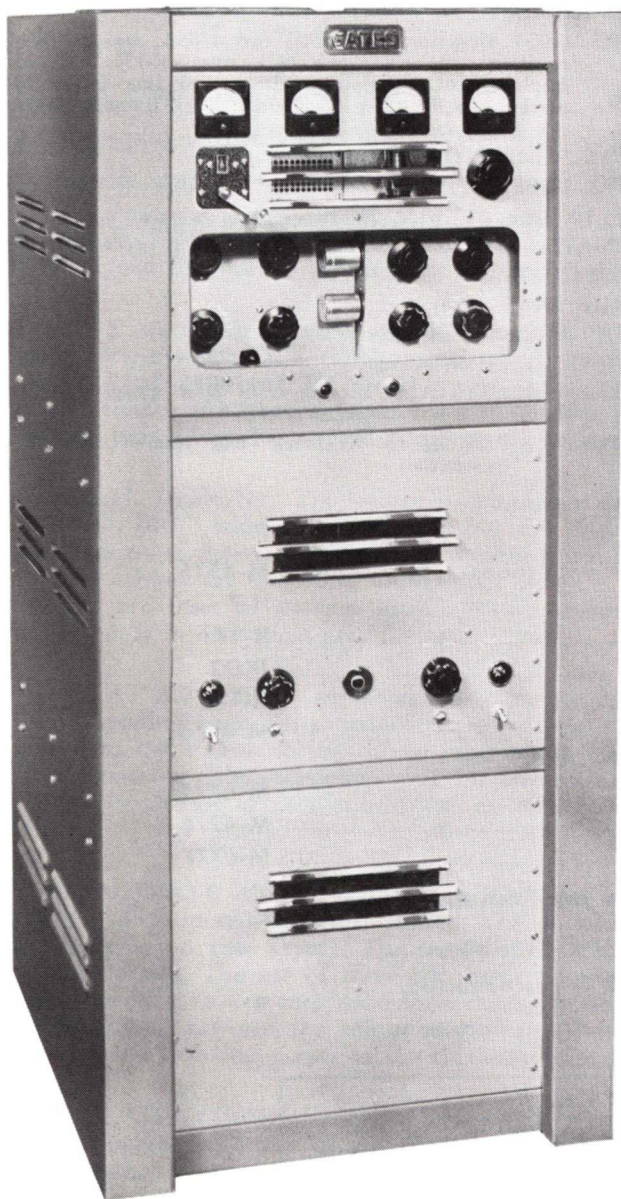
* State frequency when ordering.

** State frequency when ordering. Use only with JKO-2 oven.



250 WATT HIGH FREQUENCY TRANSMITTER

Model CMG-1



The CMG-1 250 watt high frequency transmitter is used for telephone and telegraph operation and is continually variable between 2-32 mc, with high level modulation. The CMG-1 may be quickly changed in frequency from the front panel.* Four crystal inputs, audio system for microphone or line, 3000 cycle cut-off filter, peak limiting amplifier to prevent over-modulation and small over-all size, make the CMG-1 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, servicing is greatly enhanced. Top chassis is a com-

plete 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 produce 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 .003% or better stability. There are no plug-in coils or relays to effect frequency change. Dial and veeeder 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 Chass 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 voltage 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.

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.

CMG-1 250 WATT HIGH FREQUENCY TRANSMITTER

SPECIFICATIONS

POWER OUTPUT: 250 watts to 26 mc, 200-225 watts up to 32 mc.
RF OUTPUT IMPEDANCE: 40-300 ohms.
RF RANGE: 2-32 mc continuously variable.
FREQUENCY STABILITY: When used as above, 0.003%.
RF HARMONICS: Suppression of harmonics meets or exceeds FCC requirements.
AUDIO FREQUENCY RESPONSE: ± 2 db 200-3000 cycles with sharp cut-off above 3000 cycles.
AUDIO HARMONIC DISTORTION: Less than 8% at all frequencies 200-3000 cycles. 100% modulation.
AUDIO INPUT: Hi-Z for microphone at -55 db input. 600 ohms at 0 dbm input level.
PRIMARY VOLTAGE: 115 volts, 50/60 cycles.
POWER CONSUMPTION: 900 watts at zero modulation, 1000 watts at average modulation, 1250 watts at 100% modulation.

CARRIER SHIFT: 5% or less at 100% modulation.
TUBES: 6AG7 oscillator; 6146 IPA; two 4/65A; two 866/866A rectifiers; one 6Y6; two 6C5; one VR-150; 6SJ7 mic amplifier; 6L7 second amplifier and line input; 6L6 driver; two PP 811A modulators; 6H 6 limiter tube and two 5U4G modulator rectifiers.
TOTAL NUMBER OF TUBES: 18.
TOTAL TUBE TYPES: 13.
SIZE: 50" high, 23" wide, 26" deep. Door swing 20".
ESTIMATED WEIGHT: 550 lbs. packed. Export packed, 720 lbs.
EXPORT CUBAGE: 53.8.
FINISH: Medium gray.
MODULATION: High level Class B.
KEYING SPEED: 60 WPM.
NUMBER OF CRYSTALS: Maximum of four (Type H-17 in JKO-2 oven).
VFO INPUT: Provided on receptacle rear terminal board of transmitter.

ORDERING INFORMATION

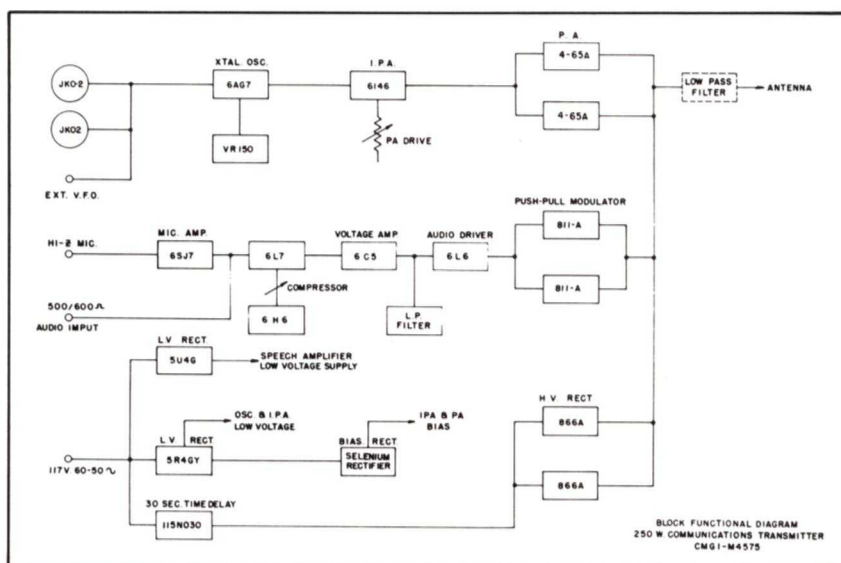
Model CMG-1 telephone and telegraph transmitter with tubes, less crystals **M-4575**
 Crystal in holder (less oven) for 0.02% accuracy **H-7**
 Crystal in holder for .003% accuracy **H-17**
 Oven to accommodate two H17 crystals **JKO2**
 100% spare tube complement **TK136**
 Microphone assembly complete **M-4576**
 Filters for added second harmonic attenuation:
 For 50 ohms **M-4775**
 For 72 ohms **M-4776**
 For 250 ohms **M-4777**

This model approved by the Federal Civil Defense Administration.

NOTE: Be sure to state crystal frequency when ordering.

* Except between 2-3 mc where one internal link is disconnected.

** The CMG-1 can be modified for transportable service in truck or trailer.



1000-WATT INPUT TELEGRAPH TRANSMITTER

Model CMP-1

- 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.

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, 28 1/2" 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.

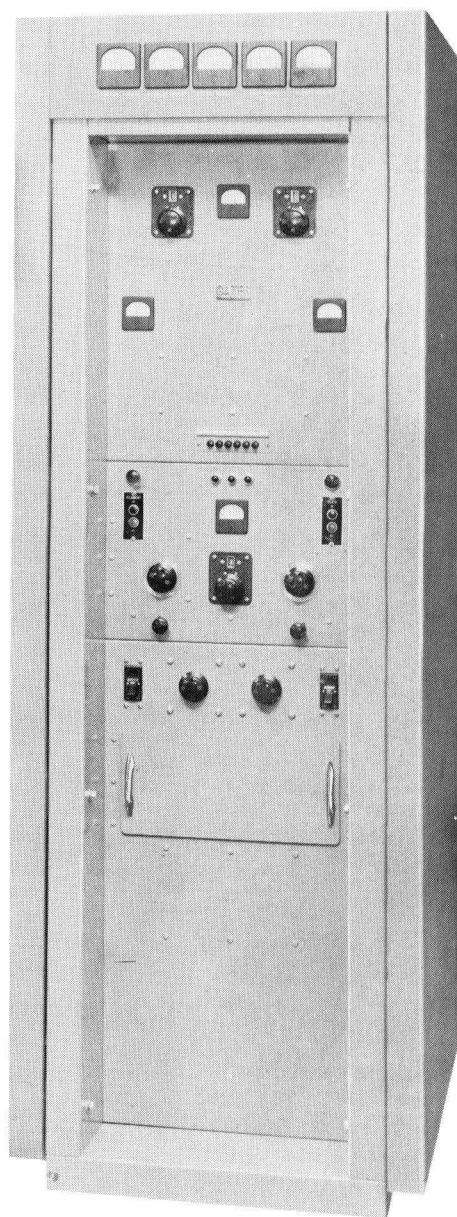
KEYER: Electronic keying, which operates in the plate circuit of the oscillator/first IPA — doubler stage, employs the principle of biasing an 811A tube where with the key closed, no current is drawn. Though keying up to 100 WPM is recommended, higher speeds are not unusual. This transmitter may also 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.



CMP-1 1000-WATT INPUT TELEGRAPH TRANSMITTER

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.

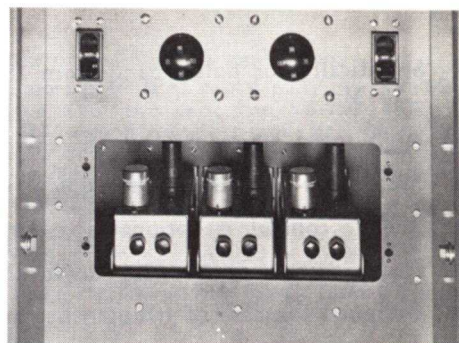
TUBES: Three 6AG7 oscillators, one 6AG7 Doubler, one 4/65A RF driver, two 4/400A RF amplifier, one 6B4G keyer, two 8008, high voltage rectifier, one 5U4G low voltage rectifier, one 5U4G bias rectifier, one 5U4G screen rectifier.

RF OUTPUT IMPEDANCE: 51.5 ohms.

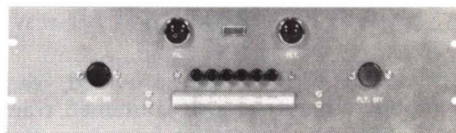
RF STABILITY: 0.003% or better.

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 cube, 90.0.



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 0.003% accuracy. Changing oscillators is accomplished through three relays, push-button operated from transmitter control, or optional remote control.



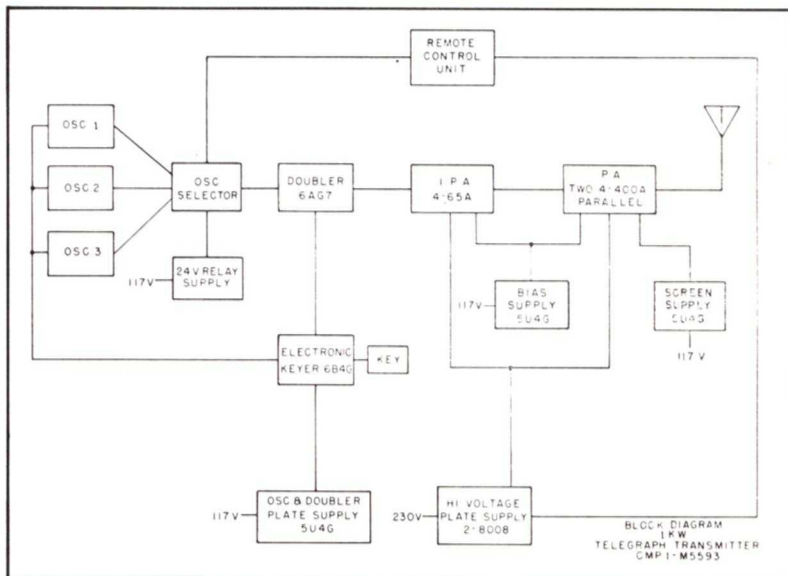
Remote control panel for use with CMP-1 transmitter where transmitter is remotely controlled from a control desk either adjacent or several hundred feet distant. Mounted on standard 19"x5¼" rack panel. Includes plate On-Off switch, keying facility, pilot lights indicating filament and plate On, and push-button for selection of operating frequencies.

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 to 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.



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.

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: 0.003% 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.

SHIPPING 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 12-33 Mc M-3645

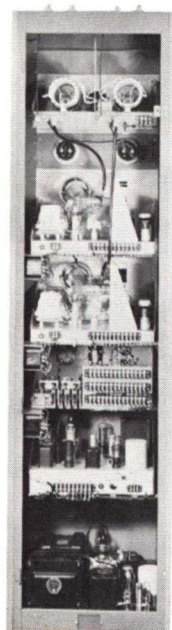
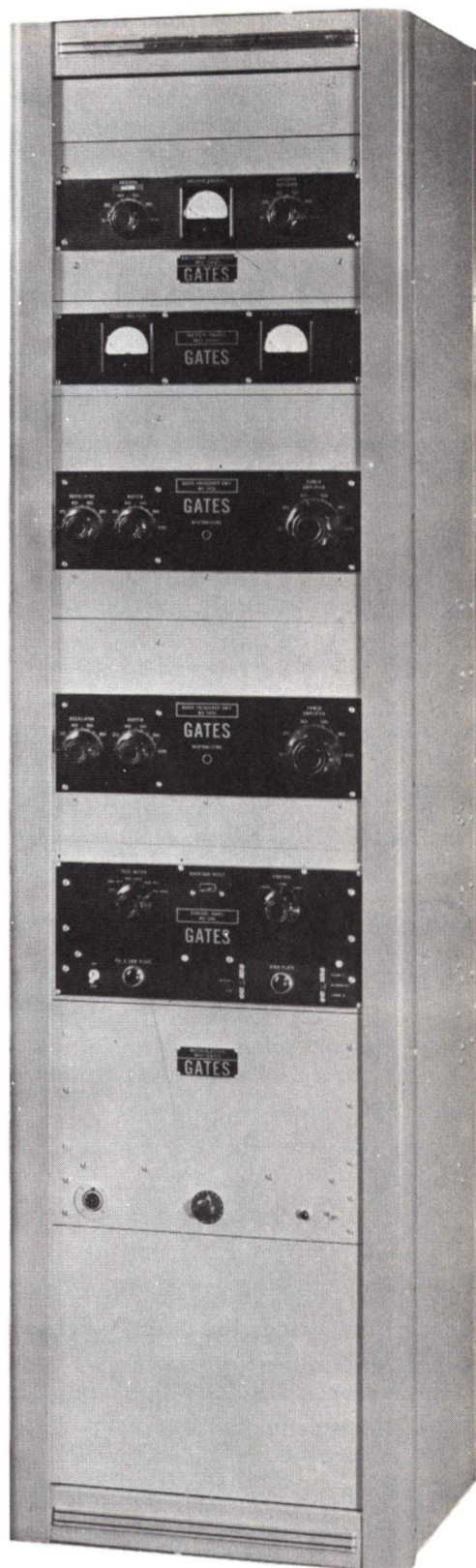
Crystal and holder for 0.02% accuracy H-7

Crystal and holder for use in JKO-2 oven (listed below) 0.003% 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 1/2 operating frequency.)



SINGLE CHANNEL PHONE CW 250 WATTS OUTPUT

Model M-3491

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.

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 0.003% accuracy.

SPECIFICATIONS

FREQUENCY RANGE: 2-22 Mc by coil selection.

FREQUENCY STABILITY: 0.003% 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

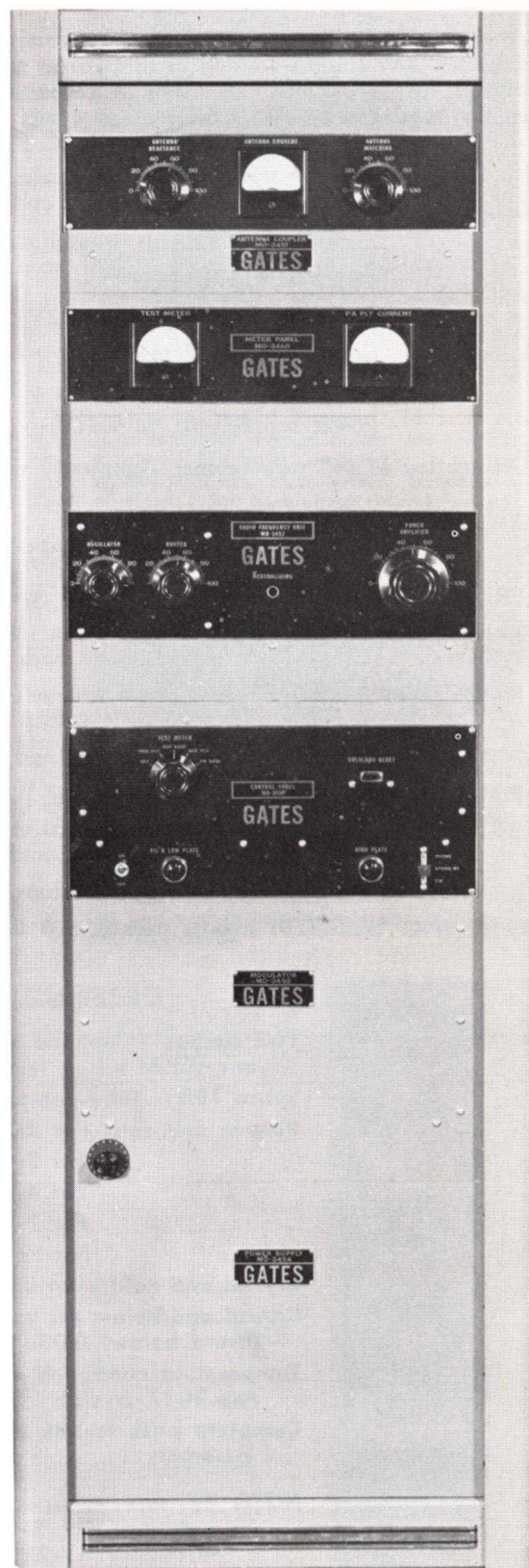
Crystal and holder for 0.02% accuracy H-7

Crystal and holder for use in JKO-2 oven
(listed below), 0.003% 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 1/2 operating frequency.)



CMW-1 2-22 MC TRANSMITTER

(700 Watts Input, Telephone and Telegraph)

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 Colpitt oscillator. Added crystals may be 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.

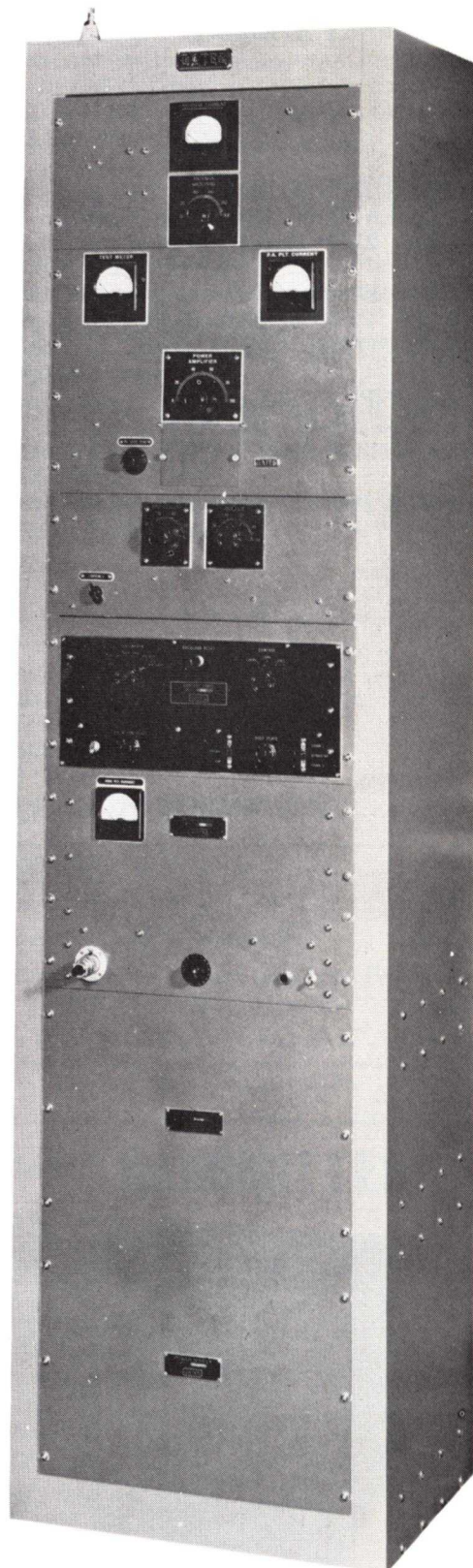
LOCAL REMOTE CONTROL provision is made by providing terminal connections for remote operation of: (a) plate on, (b) phone on, (c) channel on, (d) filament on light, and (e) plate on light.

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. An O-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.

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.



CMW-1 2-22 MC TRANSMITTER

SPECIFICATIONS

FREQUENCY RANGE: 2-22 Mc.

FREQUENCY STABILITY: Where used with JK02 temperature controlled oven (2 crystals in one oven), stability is .003%. 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 $\pm 2\frac{1}{2}$ 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) 800B.

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**

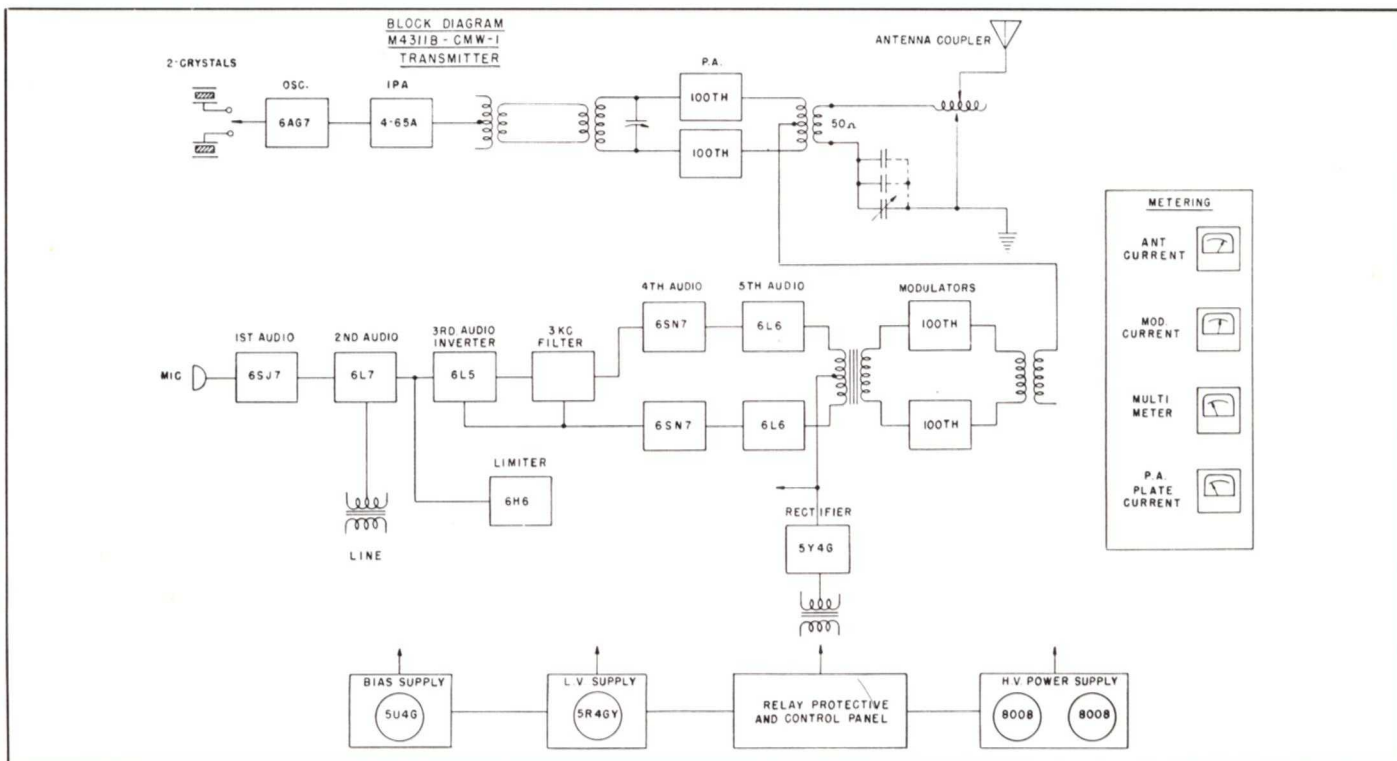
Spare 100% tube complement **TK137**

Crystal and holder for .02% accuracy* **H-7**

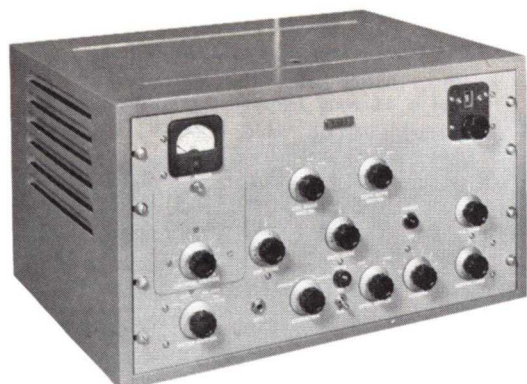
Temperature controlled oven for two H-7 crystals **JK02**

* State frequency desired when ordering.

NOTE: This model approved by Federal Civil Defense Administration.



65/85 WATT TRANSMITTER OR EXCITER



SPECIFICATIONS

(65/85 Watt Transmitter)

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 JKO2 temperature controlled ovens (2 crystals to an oven) for .003% 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 tubesM-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 .003% accuracyJKO2

NOTE: Please state carrier frequency desired when ordering crystals. For complete telegraph and telephone transmitters, see subsequent pages, Model CM-65.

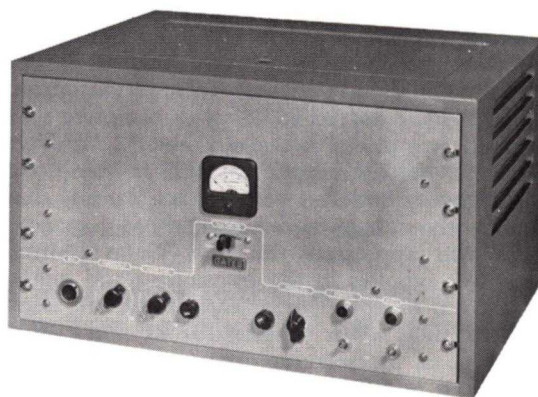
A carefully engineered precision RF unit having a wide variety of applications. Designed strictly for commercial applications and tunes all frequencies continuously variable, between 2 and 32 megacycles. When used with the M5570 amplifier modulator, described immediately following, an excellent 65 watt (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.

MODULATOR/AMPLIFIER FOR 65 WATT TRANSMITTER

Designed as a companion unit for M-5569 transmitter shown above. Has four stages with low-pass filter and peak limiting amplifier to meet full FCC specifications. 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. (con't)



MODULATOR/AMPLIFIER FOR 65 WATT TRANSMITTER

SPECIFICATIONS

APPLICATION: Designed for high level modulating the M-5569 transmitter on preceding page. 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, 10 $\frac{1}{2}$ " high, 14 $\frac{1}{2}$ " deep.

In cabinet as illustrated — 20 $\frac{1}{2}$ " wide, 12" high, 15" deep.

POWER: 115 volts, 50/60 cycles at 240 watts (100% modulation).

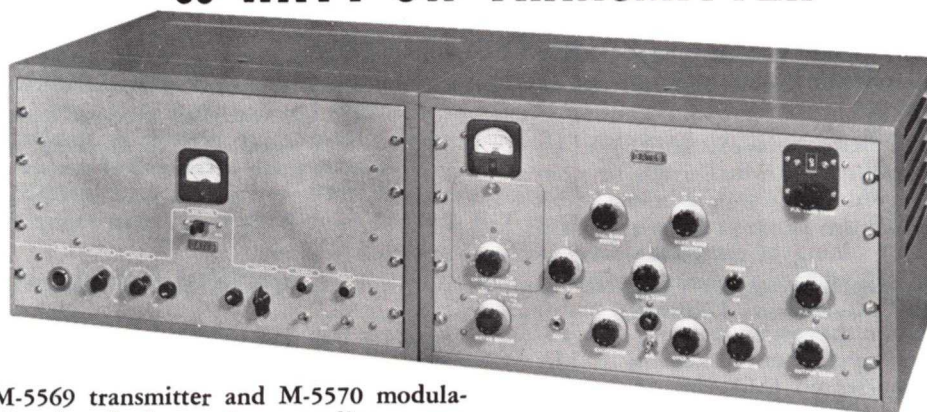
WEIGHT: 90 lbs. packed. Cubage 4.

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.

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 practical. 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 ready 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 page 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 .003% 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.



SSB-100 SINGLE SIDEBAND TRANSMITTER RECEIVER

Model SSB-100



The SSB-100 single sideband transmitter/receiver is a complete 100 watt SSB radio station primarily intended for point to point radio communication and including in the one cabinet both transmitter and receiver. With the use of SSB techniques, a performance equivalent to that provided by conventional amplitude modulated (AM) equipment of several times the power output may be obtained simply and at low cost. Other advantages resulting from SSB operation are much improved intelligibility during reception of signals subject to selective fading and reduction in interference from other transmissions due to a narrower and more sharply defined receiver passband.

The transmitter follows normal SSB design but has been simplified where feasible. Speech signals pass through the microphone amplifier to the 250 Kc/s balanced modulator. The upper sideband product is selected by a mechanical filter and then shifted to an IF frequency of 1650 Kc/s in the second modulator. After amplification at this frequency, the signal is shifted to the radiated frequency in

the third modulator. Two linear amplifiers follow and the output stage feeds the antenna via a Pi-L network.

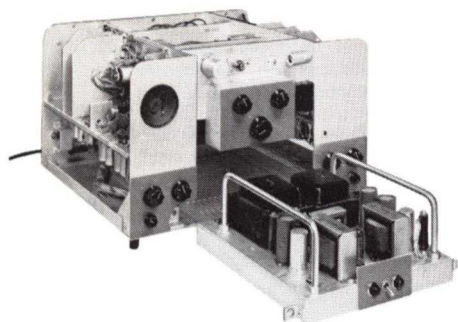
The receiver employs 3 successive frequency translations using the same IF frequencies as the transmitter. A tuned RF stage is included and a mechanical filter identical with the transmitter filter is used to select the wanted sideband. The audio output amplifier drives a loudspeaker mounted within the unit.

Audio squelch circuitry is provided to remove annoying noise when no signal is being received.

All local oscillators are crystal controlled with the crystals mounted in thermostatically controlled ovens in order to achieve the required frequency stability.

The power supply circuits are conventional and provide high voltage, low voltage and bias supplies for the equipment.

SSB-100 SINGLE SIDEBAND TRANSMITTER/RECEIVER



FEATURES

POWER ADVANTAGE — The radiated energy in SSB operation is concentrated in one sideband only. This results in a 4 to 1 power advantage over conventional AM operation for a given output rating when used with a SSB receiver.

SPECTRUM ECONOMY — The use of half the spectrum space necessary for AM permits closer spacing of HF SSB channel assignments.

REDUCED INTERFERENCE — The narrower bandwidth requirements result in reduced interference with other services.

GREATER INTELLIGIBILITY — The reduction of frequency selective fading in a SSB system, results in decreased distortion and greater intelligibility especially under marginal signal conditions.

DUPLEX FREQUENCY OPERATION — The option of operating with different transmit and receive frequencies in each channel is an important advantage not available on most competitive equipment.

SPEECH CLIPPER — The clipper increases the average transmitted speech power using simple and reliable circuitry.

TUNE-UP PROCEDURE — A self-contained audio oscillator facilitates tune-up procedure.

COMPATIBILITY — Compatibility in communicating with AM equipment is possible through re-inserting the carrier on transmission, and using on reception, the separate true envelope detection system which is incorporated in the SSB 100.

RECTIFIERS — Silicon rectifiers only are used in the power supply for increased reliability.

TECHNICAL SPECIFICATIONS

GENERAL

Frequency Range: 2-15.0 Mc/s.

Channels: 4 crystal controlled channels using the same frequency for transmit and receive

or

2 crystal controlled channels using different frequencies for transmit and receive

Service: Single sideband with suppressed carrier (A3a)

Single sideband with transmitter carrier

CW telegraphy (A1)

Keyed tone telegraphy (A2)

Either upper or lower sideband may be selected

Double sideband AM telephony (A3) can also be received

Power Source: 117/230 volts, 50/60 cps, single phase
Silicon rectifier.

Approx. 175 volt amperes required for receive and 300 volt amperes required for transmit

Size: Cabinet for desk mounting - Width 19", depth 18½", height 12"

Weight: 61 lbs.

Environment: Temperature range 0° - 50°C

Humidity range 0° - 90%

Antenna: Resistance 5 to 50 ohms, Reactance - 500 to 0 ohms

RECEIVER

Signal/Noise Ratio: 12 db min for 1 μ V input

Selectivity: (a) SSB BW. 6 db 3.2 Kc

BW. 60 db 5.4 Kc

(b) DSB BW. 6 db 7.5 Kc

BW. 60 db 70 Kc

Spurious Rejection: -70 db including images and sub-carrier responses

Audio Response: Within 3 db from 350-3000 c/s

Audio Output: 1.5 W maximum. More than 50 m W output with 1 μ V input.

TRANSMITTER

Power Output: 100 watts PEP

Carrier, 36 db

Spurious Suppression: Unwanted sideband, 50 db

Second harmonic, 50 db into a 52 ohm load

Spurious radiation, 50 db

Intermodulation- At least 30 db below either of two equal tones resulting in PEP of 100 Watts

Frequency Tolerance: $\pm 0.0005\%$

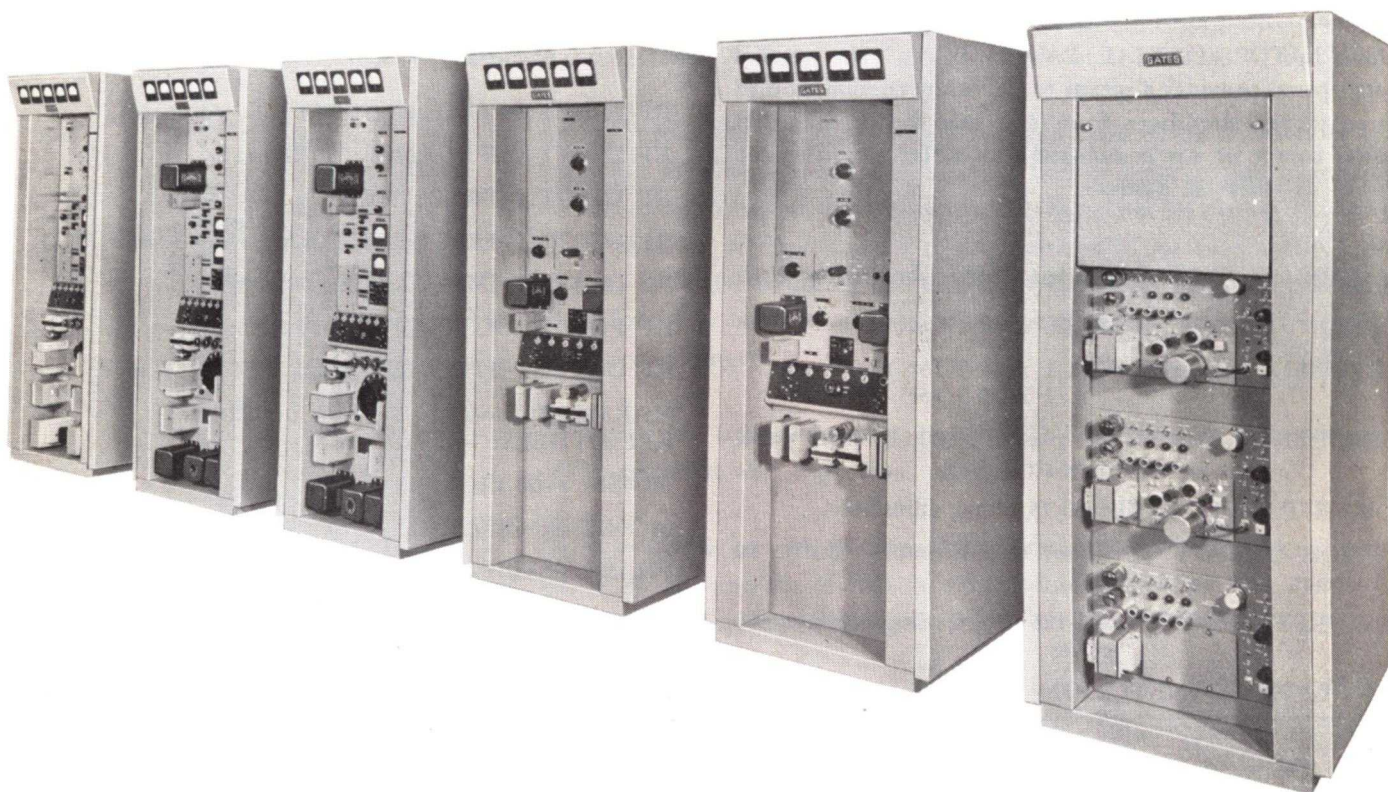
Audio Response: Within 3 db from 350-3000 c/s

ORDERING INFORMATION

SSB-100 Transmitter/receiver with tubes, less crystals	M-5805
Crystal for any frequency (specify when ordering) each	M-5882
Microphone with push to talk desk stand	M-5883
Spare 100% tube complement	TK-353

RADIO FREQUENCY REFERENCE SYSTEM

Model M-5687



The Gates M-5687 radio frequency reference system consists of five individual power amplifiers, along with a sixth cabinet, which contains three frequency control units, each with its own buffer amplifier. The first of the power amplifiers is a 1000 watt, 46-54 MC amplifier. It requires a driving power of 1 watt at the desired output frequency. The second unit is a 1000 watt 430-480 MC amplifier which requires a driving power of 1 watt at one-ninth of the desired output frequency. The third amplifier provides 100 watts output power in the range of 860-960 MC with an input power of 1 watt at one-eighteenth of the desired output frequency. In the complete system the 48 MC and 440 MC amplifiers are duplicated to provide for complete reliability.

The Gates M-5687 transmitting system is used normally in the UDOP system of measuring the velocity and posi-

tion of guided missiles to an accuracy which is unobtainable with any other system. The individual amplifiers, all of which are completely self-contained, can be provided for other applications.

In the system application, phase shift between amplifiers can be held to less than 5° during a fifteen minute operating period. Each of the oscillator-buffer amplifiers will provide a full 10 watts of driving power so that two or more of the individual amplifiers can be excited from one frequency source in the 46-54 MC range.

Built for trailer installation, all of the units in the system are ruggedized to allow this transportability. Your questions concerning individual application of the amplifiers will be welcomed.

(con't)

M-5687 RADIO FREQUENCY REFERENCE SYSTEM

SPECIFICATIONS

(Moving from right to left in the group photo)

OSCILLATOR-COAXIAL PATCH BAY: The coaxial patch panel provides a means to drive any combination of three power amplifiers from any one buffer amplifier power source or any combination of buffer amplifier and power amplifier as desired.

M-5708, M-5709 Oscillator Buffer Amplifier Unit

TUNING RANGE: 46-54 MC crystal control.

FREQUENCY STABILITY: 1 x 10⁻⁷ for 15 minutes.
1 x 10⁻⁵ for 8 hours.

FREQUENCY CHANGE: 1 part in 20,000 by front panel control.

OUTPUT IMPEDANCE: 50-75 ohms, adjustable.

POWER OUTPUT: Oscillator 10 milliwatts — Buffer 10 watts.

A.C. POWER INPUT: 105-125 Volts, single phase, 60 cycles.

RF OUTPUT CONNECTION: Type UG-291/U.

SIZE: 5½" x 8½" with rear cover projecting 2¾" at rear.

M-5704, 1 KW CW AMPLIFIER

RF INPUT FREQUENCY RANGE: 46-54 MC.

RF INPUT IMPEDANCE: 50 ohms.

RF INPUT POWER: 1 Watt.

RF OUTPUT FREQUENCY RANGE: 46 to 54 MC.

RF OUTPUT IMPEDANCE: 50 ohms.

RF OUTPUT POWER: 1000 watts.

RF OUTPUT FITTINGS: 1½" RETMA flange.

HARMONICS, 2nd: At least — 80 db.

ALL OTHERS: At least — 60 db.

NOISE: —60 db.

MONITOR OUTPUT: Minimum 10 MW into 50 ohms.

PHASE STABILITY: Less than 10° over 15 minute period, after 1 hour warm up.

AC POWER INPUT: 120/208 volt, 3 phase, 4 wire, 60 cycle.

Provision made to remote control unit over telephone pairs.

SIZE: 66 inches high x 25½" wide x 36" deep.

M-5705, 1 KW CW AMPLIFIER

RF INPUT FREQUENCY RANGE: 46-54 MC.

RF INPUT IMPEDANCE: 50 ohms.

RF INPUT POWER: 1 watt.

RF OUTPUT FREQUENCY RANGE: 430-480 MC.

RF OUTPUT IMPEDANCE: 50 ohms.

RF POWER OUTPUT: 1000 watts.

RF OUTPUT FITTINGS: 1½" RETMA flange.

HARMONICS,—2nd: —80 db or better.

ALL OTHERS: —60 db or better.

NOISE: —60 db.

MONITOR OUTPUT: 10 MW into 50 ohms.

PHASE STABILITY: Less than 10° over 15 minutes after 1 hour warm up.

AC POWER INPUT: 120/208 V, 3 phase, 4 wire, 60 cycles.

Provision is made to remote control over telephone pairs.

SIZE: 66" high x 25½" wide x 36" deep.

M-5706, 100W CW AMPLIFIER

RF INPUT FREQUENCY RANGE: 46-54 MC.

RF INPUT IMPEDANCE: 50 ohms.

RF INPUT POWER: 1 watt.

RF OUTPUT FREQUENCY RANGE: 860 to 960 MC.

RF OUTPUT IMPEDANCE: 50 ohms.

RF POWER OUT: 100 watts.

RF OUTPUT FITTINGS: 1½" RETMA flange.

HARMONICS: 60 db.

NOISE: 60 db.

MONITOR OUT: 10 MW into 50 ohms.

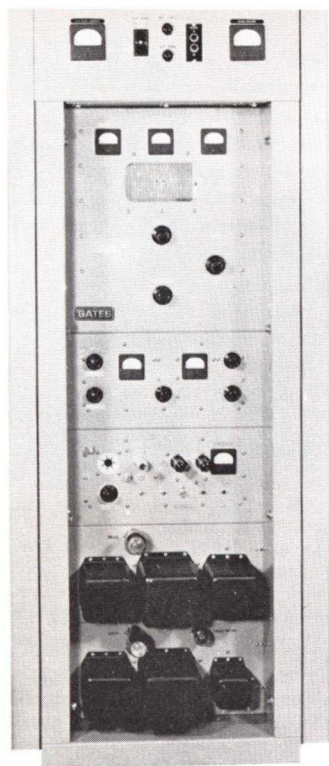
SIZE: 66 inches high x 25½" wide x 36" deep.

WEIGHT: 1200 lbs.

Provision made to remote control unit over telephone lines.

AC POWER INPUT: 120/208, 3 phase, 4 wire, 60 cycle.
Provision for a continuous reduction of RF power out. 60 db below the nominal 100 watts out.

250/300 WATT SPECIAL PURPOSE VHF TRANSMITTER



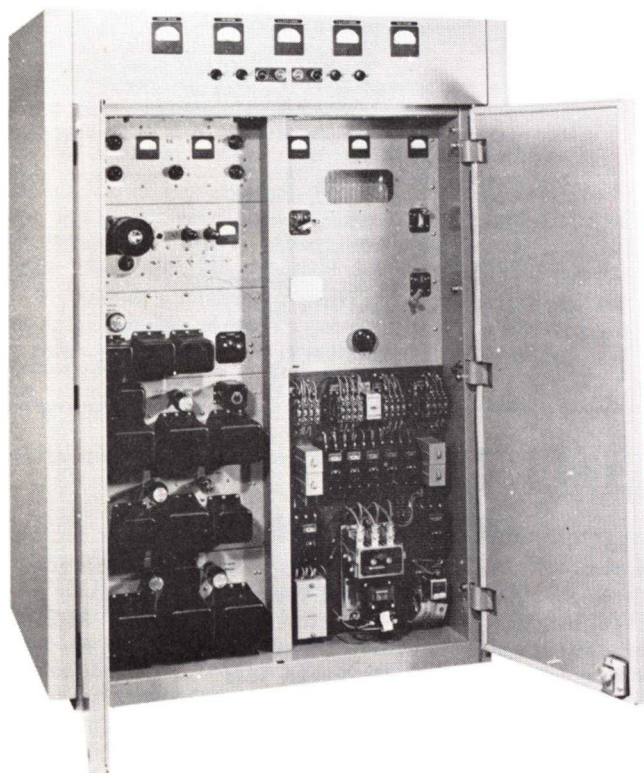
This transmitter has been designed for special applications where highly stable equipment is mandatory such as in Guided Missile projects or any application where a better than the best commercial standard is required.

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.

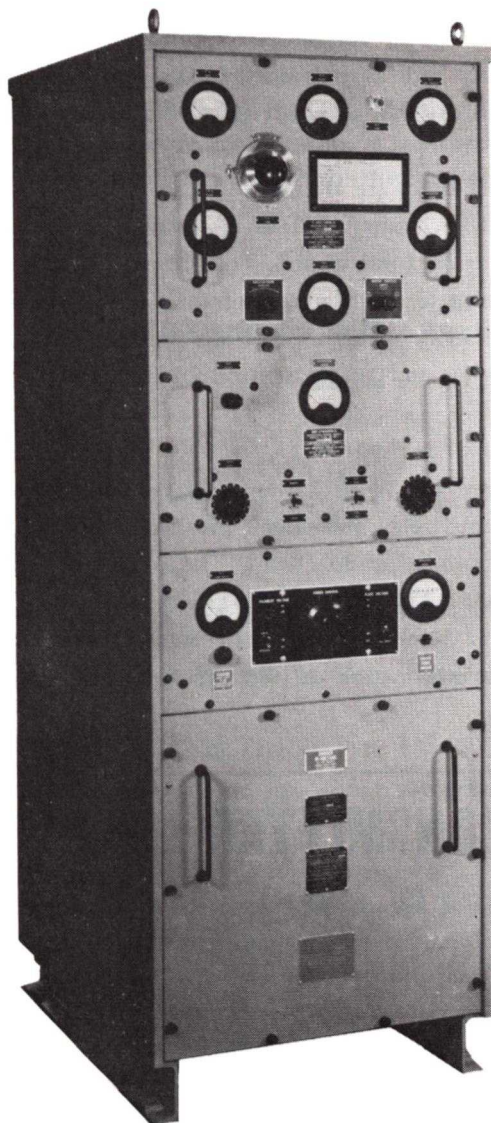
2 KW VHF PRECISION TRANSMITTER



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 inbuilt features that meet exacting demands. 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. Write for specific information on this model.

HOMING BEACON TRANSMITTER

Model MO-3975



Built to JAN specifications, 400 watts maximum power output with variable front panel power selector for lower powers to 25 watts. Includes associated antenna coupler, remote control station and automatic code keyer. Frequency range, 200-800 Kc.

The Gates MO-3975 low frequency homing beacon transmitter is designed for operation at any carrier power up to 400 watts. Carrier power is adjustable down to 25 watts by means of a tapped auto transformer controlled with a heavy tap switch on front of the transmitter. Pressurized forced air cooling is provided. High level modulation is employed, along with a complete audio system incorporating a peak limiter to prevent over-modulation, and a type 36 code keyer operating from a phase shift type audio oscillator at 1020 cycles.

General construction is to JAN specifications, in heavy steel frame to which each drawer section is secured by captive thumb screws. Design is heavy enough to stand Class B shock tests and operate in ambient temperatures between -54°C . and $+65^{\circ}\text{C}$. — Automatic reset of the carrier provides 4 instantaneous recycling periods

before turn-off. Transmitter may be reset from the switch provided on the remote control unit.

Xenon gas type high voltage rectifier tubes are employed to permit operation in extremely low ambient temperatures. — RF output is 51.5 ohms unbalanced, which may feed into coupling unit of purchaser's design or the Gates MO-4116 tuning unit which is designed to couple into T type antenna 200' on the horizontal and vertical down lead heights from 15 to 50 feet.

The remote unit consists of complete speech amplifier along with transmitter off-on switch. Amplifier is provided with decibel meter, level control and dynamic microphone of 50 ohms impedance attached to push-to-talk desk stand. — Designed either for desk or rack mount. Size $10\frac{1}{2}'' \times 19'' \times 12''$.

SPECIFICATIONS

CARRIER POWER: Maximum, 400 watts; minimum, 25 watts.

MODULATION: Class AB 1 high level — voice, or code wheel keying at 1020 cycles.

KEYER: Type 36 code keyer 8 RPM or equal to 4/6 RPM. Code wheel has 60 segments allowing for any three-letter identification with code signal. Segments are of stainless steel and adjustable with ordinary screw driver.

CARRIAGE RANGE: 200 to 800 Kc.

FREQUENCY STABILITY: 0.003%.

AUDIO RESPONSE: ± 2 db 400-3000 cycles with sharp cut-off at 3000 cycles and gradual roll-off below 400 cycles for good voice quality.

NOISE: 40 db below 100% modulation at 400 watts.

DISTORTION: 6% or less 400-3000 cycles.

RF IMPEDANCE: Transmitter, 51.5 ohms. When used with M-4116 coupler, to couple to T antenna 200' long and lead in to 50'.

AUDIO IMPEDANCE: Transmitter, 600 ohms — 10 db for 100% modulation at 400 watts output. Microphone input, 50 ohms.

CONTROL: Local or remote by means of 3-wire cable or 600 ohm 2-wire simplex telephone line.

POWER CONSUMPTION: 2200 watts at 115 volts, 60 cycles, single phase at full power output.

TUBES: 5670 (2C51) crystal or VF oscillator; 6AC7 first IPA, 807 second IPA, 4-400A power amplifier, PP 4-250A modulators, PP 6SJ7 audio drivers, pair 4B32 xenon gas rectifiers, pair 5U4G low voltage rectifiers, 6X5GT bias rectifier and 6L6 clamp tube. — Remote unit, three 6SJ7 and one each 5U4G, VR105.

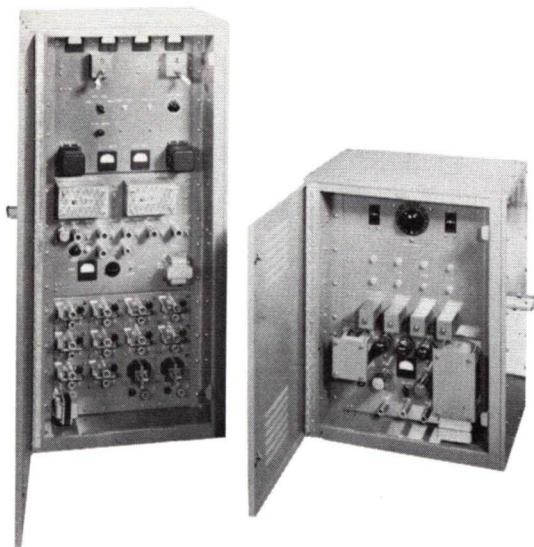
METERING: Individual 3" meters provided for: power line voltage, elapsed time, second IPA plate, PA grid, PA plate, modulator plate and RF output. — Single multi-metering for crystal oscillator plate, first IPA plate and second IPA grid.

SIZE AND WEIGHT: Transmitter 72" high, 26" wide and 30" deep, closed. Added 24" from front to back with drawers out. — Weight packed, 1400 lbs., 60 cu. ft. Antenna coupler and speech unit not included. Weight of remote unit, 80 lbs., 4 cu. ft. Weight of remote antenna coupler, 120 lbs., 8 cu. ft.

ORDERING INFORMATION

Transmitter complete with tubes and self-contained code keyer, less antenna coupler, remote control unit, and crystal	M-3975
Antenna coupler complete	M-4116
Remote control/audio amplifier, less microphone	M-4033
Microphone and desk stand assembly	M-4124
Crystal (state frequency)	H17

UHF COMMAND TRANSMITTER and CHECK-OUT GENERATOR



The Gates Model MPS-41 Command Transmitter and Model MPS-73 Checkout Generator are manufactured for operation on one fixed RF frequency in the range of 406-550 MC. Both are highly stable units designed for operation over a very wide range of ambient temperature and humidity. Both units provide up to 12 high-stability audio and supersonic tones for control functions. The tone generators are capable of extremely rapid keying with a minimum of keying transients.

The Command Transmitter consists of 2 lightweight, though ruggedly built, units of approximately relay rack dimensions, one of which is 4½ feet tall and the other, the power supply, being 3 ft. in height. These units can be truck or trailer mounted for convenience and will withstand forces of 10 g's while in transit between operating locations.

The Checkout Generator is identical to the transmitter except for size and output power. It is intended for relay rack mounting and is pictured here in an open rack for detail. With its output continuously variable in the range of 5-100,000 microvolts, it is ideal for checking out a drone or missile control system prior to launching. It is, of course, used in close proximity for convenience.

Many variations of these units can be provided. For example, the transmitter can be provided in power outputs up to 1 KW. Tone oscillators can be provided with relay keying rather than electronic gating. On special order, multi-channel units can be provided for instantaneous frequency change.

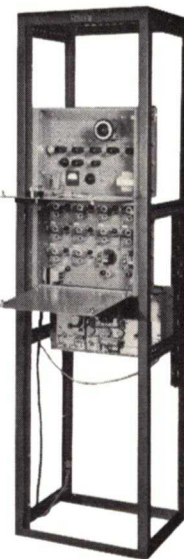
SPECIFICATIONS

TRANSMITTER

FREQUENCY RANGE: 406-550 Mc.
 FREQUENCY STABILITY: .0025%.
 POWER OUTPUT: Transmitter — 150 Watts.
 Generator — 5 to 100,000 microvolts.
 HARMONIC & SPURIOUS EMISSION: 60 db below carrier level.
 OUTPUT IMPEDANCE: 50 - 52 ohms.
 FREQUENCY SWING: ± 200 Kc Max.

MODULATOR

Up to 12 modulating oscillators are provided in the frequency range of 7.5 to 40 KC (Exact frequencies as specified by customer.)
 10 crystal controlled audio oscillators are normally provided along with 2 variable frequency oscillators.
 AUDIO OUTPUT: Variable from ± 20 to ± 75 KC.
 STABILITY: ± 10 cycles.
 DISTORTION: 3% or less.
 MODULATING OSCILLATORY KEYING: Electronically gated.
 GATING CHARACTERISTICS:
 +15 VDC opens gate.
 +4 VDC or less gate closes.
 Gating current 300 ua or less
 KEYING TRANSIENTS: Exceed steady state amplitude by not more than 30%.
 Do not exceed 300 microseconds duration.
 TONE SIGNAL STABILITY: Amplitude of single keying tone changes less than 5% when up to 4 additional tones are keyed.



ORDERING INFORMATION

UHF Command
 Transmitter MPS-41
 Checkout Generator MPS-73

VLF LINEAR AMPLIFIER

Another example of Gates engineering leadership is the wideband VLF 10 KW amplifier which is used in the "CONSOL" navigation system. The center operating frequency of this unit is 190 KC, however, its frequency range extends from 140-240 KC without any retuning. RF input power required is 50 milliwatts at the desired operating frequency to provide an output power of 10 KW or more.

Extremely high stability is provided in this amplifier to

the extent that the output signal is in phase with the input signal to a tolerance of $\pm 2^\circ$. Provisions are made within the amplifier to provide for up to 30% tone modulation (A2 emission) and the unit is capable of blocked grid keying up to fifty words per minute.

This amplifier is built to perform under the extremely rigorous environmental requirements set forth by the Federal Aviation Agency in its Specifications FAA-R-777.

50 WATT VHF AM TRANSMITTER

Model M-5610

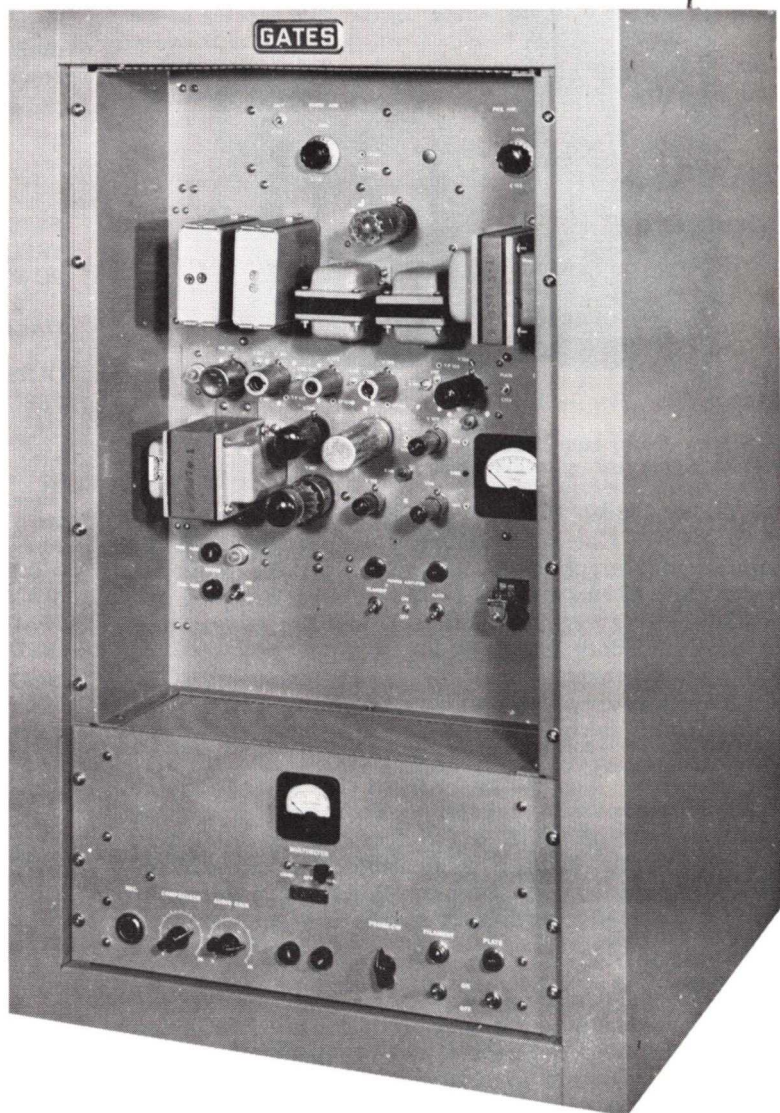
The Gates M-5610 Transmitter has been designed to provide a highly reliable, short range, VHF communications unit which is capable of continuous operation.

The transmitter is constructed in a waist-high rack cabinet, but can be provided for rack mounting in the regular manner if desired. The cabinet model size is 38" high, 24" wide and 23" deep. These transmitters may be installed one on top of the other if such mounting is more convenient for the customer.

This transmitter will provide a full 50 watts of amplitude modulated power output (approximately 90 watts input power) over the entire range of 90-150 MC. It is designed for crystal control operation on any one frequency within this range and if a frequency change becomes necessary in the field, it can be accomplished very readily.

High level plate modulation is used to provide maximum reliability and easiest possible servicing. The modulator provides its own separate power supply in order to maintain the low carrier shift so necessary in this service.

The modulator incorporates a fast acting limiting amplifier to maintain high modulation percentages. The audio input will accommodate either a crystal or high-impedance dynamic microphone. Push-to-talk operation can be used with any normal system and if desired Gates can provide a standard microphone with push-to-talk desk stand which has been designed to operate with this transmitter.



SPECIFICATIONS

POWER OUTPUT: 50 Watts.

FREQUENCY RANGE: 90 to 150 MC.

RF OUTPUT IMPEDANCE: 50-75 ohms.

TYPE OSCILLATOR: Crystal Control — overtone type crystal.

FREQUENCY STABILITY: .005% standard — up to .0005% available.

AUDIO INPUT: Hi-Z for Crystal or Dynamic microphone.

FREQUENCY RESPONSE: ± 3 db 300 to 2500 cycles.
Down 20 db at 50 cycles and
40 db at 5000 cycles.

AUDIO DISTORTION: 8% or less 300 to 2500 cycles.

NOISE: 40 db or better below 100% modulation.

HARMONIC RADIATION: 50 db or better below carrier.

POWER INPUT: 117 VAC, 60 cycles, 350 watts.

SIZE: 38" high, 24" wide, 23" deep. (Cabinet model)

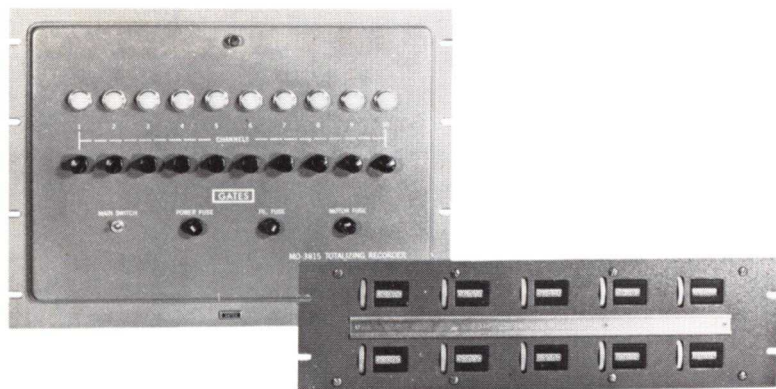
WEIGHT: Approx. 200 lbs. packed for shipment.

CUBAGE: 17 cubic feet.

TUBE COMPLEMENT:

1 - 5894	1 - 6AU6
1 - 6360	1 - OB2
3 - 6AK6	2 - 6550
3 - 12AT7	1 - 5879
1 - GZ34/5AR4	2 - OC3
1 - 6080	3 - 5R4 GY

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.

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.

SPECIFICATIONS

CONSTRUCTION: Totalizer recorder: 14"x19" cast aluminum panel and shelf with drop down front door for component servicing. Finish, gray. Counter panel: 5 1/4" x 19". 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

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 56 and 57 (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 229.

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.

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 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



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.

SPECIFICATIONS

INPUT IMPEDANCE: 600 ohms.

INPUT LEVEL: Approximately 0 VU.

FREQUENCY RESPONSE: +1 db 20-20,000 cycles.

DISTORTION: 1 1/2% 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, 5 1/4" high, 16 1/2" deep.

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

SHIPPING WEIGHT: 35 lbs.

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.	

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 $4\frac{1}{2}$ " 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 $3\frac{1}{2}$ " 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 $10\frac{1}{4}$ " 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, $14\frac{1}{2}$ " long and $5\frac{3}{4}$ " 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.

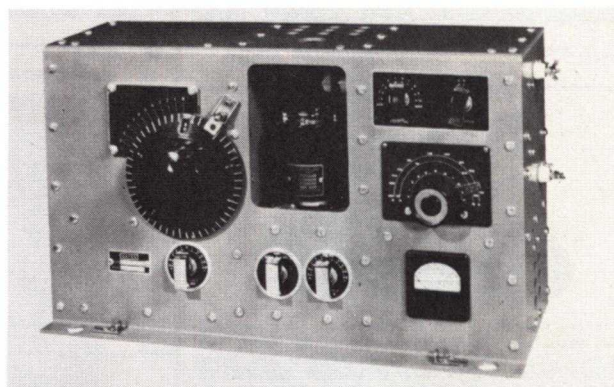
Mileage range of this equipment cannot be definitely stated as location has varying effect. The TR500 citizens unit has 10 watts input or 40 to 50 watts output which is in excess of normal citizens band equipment. Under normal conditions, coverage or several miles can be expected.

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, $\pm .0025\%$. 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

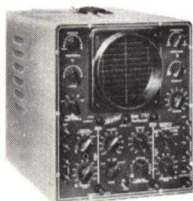


A specially designed unit for 540-1600 Kc operation providing the stability of crystal control on the operating frequency or switch to VFO for change to any broadcast frequency. Has calibrated dial in 10 Kc steps with 1-1500 dial and 200 cycles/div. straight line. Stability, crystal ± 10 cycles. VFO ± 200 cycles under normal operating conditions. Output, 2 watts at 70 ohms. — Size: 19" wide, $10\frac{1}{2}$ " high and $6\frac{1}{2}$ " 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

ACCESSORY EQUIPMENT

5" OSCILLOSCOPE

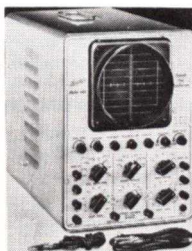


This large Hickok commercial scope is one of the industry's most popular. Frequency response wide band DC to 5 Mc and narrow band to 2.5 Mc within 3 db. Uses 5ADP1 flat faced cathode ray tube. Complete in every detail including illuminated calibrated green screen and filter. Size: 14" x 12" x 18" deep. For 115 volts, 50/60 cycles.

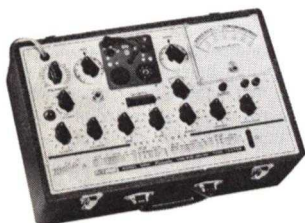
5" Oscilloscope 770

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

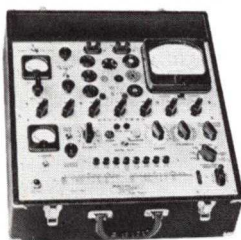


PORTABLE TUBE TESTER

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, 11 1/4" long, 7 1/2" 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 3 1/2" to 19 1/4" in 1 3/4" multiples.

Blank panels, per 1 3/4" multiples BL-1

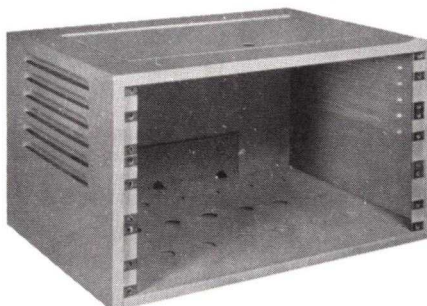
VOLT-OHM-METER



This Simpson model is the broadcaster's right hand. Over 3/4 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

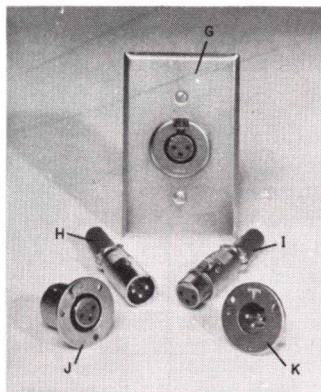
DESK RACK CABINET



Styled and finished in gray to match all Gates equipment as well as standard industry requirements. Holds 10 1/2" x 19" rack panel space with 14" inside depth clearance. Hinged lid and well louvered for ventilation. Size: 20 1/4" wide, 11 1/4" high, 15" deep.

Desk rack cabinet M-5644

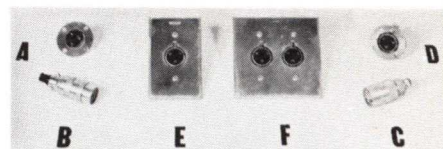
CANNON XLR CONNECTORS



Popular small size Cannon connector used universally in radio and TV.

Symbol	Description	Cat. No.
G	Single, 3 prong, female, wall plate	XLR3-B5-2G
H	Cable plug, 3 prong, male	XLR3-12
I	Cable receptacle, female, 3 prong	XLR3-11
J	Chassis receptacle, female, 3 prong	XLR3-13
K	Chassis receptacle, male, 3 prong	XLR3-14

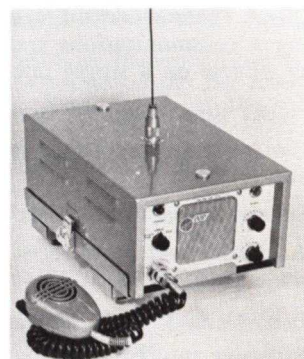
CANNON P CONNECTORS



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-GG-115
C	Cable plug, male, 3 prong	P3-GG-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

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

VACUUM TUBE VOLT-OHM-METER



A 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 $\pm 5\%$) to 1500V ohms to 1 meg. in 7 ranges.

Volt-Ohm-Meter 311
RF probe for above 0073

ACCESSORY EQUIPMENT

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.

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.

SPECIFICATIONS

SIZE: (automatic changer in steel cabinet) 38½" wide, 17½" deep, 16¼" high. (amplifier) — separate 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**

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.

SPECIFICATIONS

MODULATION INDICATION: Reads 0-110% modulation and in decibels.
ACCURACY: 2% at 100% modulation and 5% mid-scale.
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**

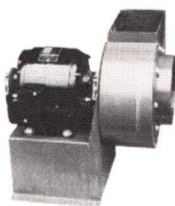
TRANSISTORIZED LOUDHAILER



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**

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**

50 KW TUBE SOCKET

Designed for use with 5891, 50 KW tube as used in Gates BC-50C transmitter. Heavy ceramic insulation and chrome plated top ring.



Tube Socket **B-40216**



3X2500 TUBE SOCKET

Ceramic insulated with aluminum base. Top section has fingers to grip plate ring on either 3X2500A3 or 3X2500F3 tube.

Tube Socket **M3934**

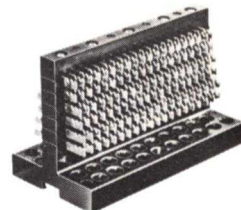
INVERTERS



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**

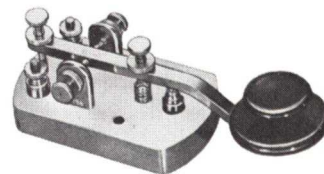
AUDIO TERMINAL BLOCK



Has 120 terminals in six rows. Molded one-piece phenolic black with base 3½" x 6⅛". Height 3½". Terminals plated brass. Polished phenolic finish makes easy removal of solder splash.

Audio terminal block **PT-106**

HEAVY DUTY KEY



Large ¼" 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**

GATES TOUCH-UP PAINT

4 colors in 16 oz. aerosol containers. For any Gates equipment. Gives superior finish.

Light gray **GF9**
 Medium gray **GF8**
 Slate gray **GF2**
 Black **GF3**

ACCESSORY EQUIPMENT

SSB CRYSTAL CONTROL



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" x 10 1/2" x 14" 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

FM RELAY RECEIVER



Designed specifically for air pickup of FM broadcasting and retransmitting 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 8 3/4" x 19". Please state frequency when ordering.

Relay Receiver CM-0

CONELRAD RECEIVER

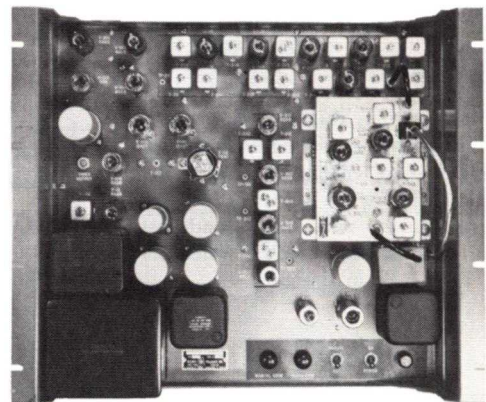


The New Conalart, 2 monitor Conelrad is specifically designed for Civil Defense and is FCDA approved Item 21. Required in all radio stations and very necessary in schools, hospitals, industries and those depending on Civil Defense. Continuously monitors all key radio stations to give warning for impending 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 8 3/4" x 9 3/4" deep. Cabinet model: 15" x 9" x 10 1/2" deep. For 115 volts, 50/60 cycles.

Conelrad Receiver, cabinet model 117R905

Conelrad Receiver, rack model 117R906

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 74 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" x 13 3/4" x 8 3/4" deep.

TV Receiver TR-1

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GATES

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GATES

PRICE LIST

(Effective July 1, 1960)

This is your price list for items listed in your Gates catalog. Each price has been carefully checked for accuracy. Rapidly changing conditions as well as the human element, will necessitate price changes or corrections from time to time. Therefore, the prices herein are subject to change without notice. — All prices are F.O.B. Quincy, Illinois. No charge is made for domestic packing. A small charge is made for export packing where overseas shipment is involved. Consistent with highest quality standards, we feel sure you will find the price on the items of your interest, both reasonable and fair.

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	UNIT
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Always Keep Price List In This
Convenient Pocket

GATES



Subsidiary of Harris-Intertype Corporation

QUINCY, ILLINOIS

DATE _____

TERMS AND CONDITIONS OF SALE

PRICE PROTECTION - Seller may adjust the price of any of the equipment covered by this order to seller's list price in effect immediately prior to shipment except that in the case of equipment manufactured by seller if (a) this order is accompanied by a downpayment of at least 25 percent of the total price of the equipment described herein and shipment is made within six (6) months after seller's acceptance of this order, or, (b) this order is herein designated as contingent upon issuance of a construction permit by the Federal Communications Commission and is accompanied by a downpayment of at least 5 percent of the total price of the equipment described herein and shipment is made within 9 (9) months after seller's acceptance of this order, no adjustment shall be made, other than as permitted herein under the provision entitled "Acceptance". If this order provides for deferred payment terms, seller may increase, but by not more than one percentage point, the rate of finance charge provided herein to its rate of finance charge in effect immediately prior to shipment.

CONTINGENT ORDERS - If this order is herein designated as being contingent, purchaser represents it has pending, or will file, with the F.C.C. an application for a construction permit. If such application as originally filed, or as amended, is denied, revoked, or abandoned, purchaser upon giving prompt written notice to that effect to seller, may cancel this order with respect to any or all items unshipped at the date of seller's receipt of said notice, whereupon seller shall refund to purchaser the balance of payments theretofore made for such cancelled items after deducting charges for special or custom-built equipment. If a balance remains payable to seller after deducting the price of such equipment, purchaser shall pay said balance upon receipt of invoice from seller.

TAXES - In addition to the purchase price, and following shipment, purchaser shall pay, or, within 10 days after receipt of invoice from seller, shall reimburse seller for, all sales, use, occupation, gross income, excise, documentary stamp, and other taxes, duties, tariffs, license fees and other charges levied, assessed, or imposed on purchaser, or at or after shipment of the equipment by seller, imposed on the equipment or required to be collected by seller by reason of, or on account of, the shipment, purchase, or sale of any article hereunder, or the execution of the contract or of notes or documents, or resulting from the transaction or any part thereof provided for herein.

WARRANTY - Seller warrants new equipment of its manufacture for one (1) year (six (6) months on moving parts) against breakage or failure of parts due to imperfection of workmanship or material, its obligation being limited to repair or replacement of defective parts upon return thereof, f.o.b. seller's factory, within the period aforesaid. Electron tubes shall bear only the warranty, if any, of the manufacturer thereof in effect at the time of shipment to purchaser. Other manufacturers' equipment covered by this order shall carry only such manufacturers' standard warranty.

Seller warrants that any new transmitter of its manufacture described herein, when properly installed by purchaser and connected with a suitable electrical load, will deliver the specified radio frequency power output at the output terminal(s) of the transmitter, but seller makes no warranty or representation as to the coverage or range of said apparatus. Seller's sole liability in the event said equipment does not so perform, or in the event that any of the equipment described herein does not conform to any statement herein relative to its operating characteristics or capabilities, shall be, at seller's option, either to demonstrate the operation of the equipment in conformance with the foregoing, or to replace it with equipment conforming with the foregoing, or to accept its return f.o.b. purchaser's point of installation and refund to purchaser all payments made thereon, without interest; provided, that seller shall have no responsibility to purchaser under the foregoing warranty unless purchaser shall give seller a written notice, within one (1) month after arrival of the equipment at purchaser's shipping point, that the equipment does not conform to said warranty.

INSURANCE - If this order provides for payment of the balance on deferred terms, purchaser will furnish to seller, prior to shipment, an insurance policy covering loss of or damage to the equipment in an amount equal to the full value of the equipment with a loss payable clause in favor of seller as its interest may appear.

SHIPMENT - Seller shall not be liable for any delay in, or inability to complete, the manufacture and shipment of the equipment, or installation of the tower and related equipment, on account of: labor difficulties; fires, casualties and accidents; acts of God; acts of the public enemy; transportation difficulties; inability to obtain equipment, materials or qualified labor sufficient to fill its orders; governmental interference or regulations; and causes beyond seller's control.

Subject to the foregoing, shipment on orders herein designated as contingent, shall be made by seller at such time, in seller's discretion, as its manufacturing scheduling and other conditions will permit.

DAMAGES AND RISK OF LOSS - Irrespective of any statement or specification herein as to the f.o.b. point of a shipment, purchaser assumes all responsibility for and risk of loss of, or damage to, the equipment upon shipment from seller's shipping point(s).

In no event shall seller be liable for anticipated profits, or for consequential damages, or for loss of use of the equipment or of any installation into which the equipment may be put.

There are no warranties, express, implied or statutory, and seller has made no representations and has, and shall have, no obligations or liabilities, whether on account of negligence or otherwise, other than as specified herein.

TOWER AND RELATED EQUIPMENT OR SERVICES - Tower erection work, ground system installation, installation of concrete foundations and anchors, and services related thereto and provided for herein, will be performed by an independent erector who shall not be deemed to be an agent of the seller.

With respect to the erection of the tower and related services, purchaser agrees that, (a) prior to shipment of the tower purchaser will have obtained from the F.C.C., the Civil Aeronautics Authority, and from any other governing bodies having jurisdiction thereof all necessary permits for the erection of the tower; (b) the erection of the tower on the proposed site will be in accordance with any building restrictions, zoning ordin-

ances, laws or governmental regulations; (c) the site will be level, clear and free from obstructions and debris, and staked off prior to arrival of the tower erection crew; (d) the site shall not consist of marshy land, swamps, dumps, rocky soil, peat or frozen soil, and the soil conditions shall be normal and suitable; (e) suitable electrical power will be available for construction work and for testing; and (f) there shall be suitable access to the site by truck and other vehicles for the hauling of all necessary materials and equipment.

The prices stated herein for tower erection and related work are based upon the presumed existence of the conditions above specified and also (g) upon normal weather conditions so that the work shall not be delayed by inclement weather; and (h) upon normal labor conditions and costs, including, but not limited to, the work not being delayed by strikes, lockouts or other labor difficulties and upon costs not being increased by the requirements of local unions for extra working or standby labor.

If either before or after the erection crew has begun the work of erection it is discovered that any of the conditions specified in (a) to (f), inclusive, do not obtain, then the erection crew foreman in his discretion may have the crew, at the expense of the purchaser, perform such work as may be necessary or appropriate in order that the specified conditions may be brought about, or may delay the beginning of the work, or if already begun may discontinue the work, and if he considers it impracticable to keep the erection crew on the site, may have the crew depart from the site. All extra costs incurred by the erection contractor as the result of the nonexistence of any one or more of the conditions specified in (a) to (f), inclusive, including the work done by the erection crew in correcting any of said conditions, and any extra costs incurred by the purchaser under conditions (g) or (h) do not exist or continue to exist during the prosecution of the work, and the cost incurred by reason of the crew's leaving the site and later returning to the site when the required conditions shall obtain, as well as the cost of any extra materials or services requested of the erection crew foreman which are not called for in this order, shall be paid by purchaser, who hereby agrees to pay to the erection crew foreman, prior to departure of the erection crew from the site, an amount equal to such costs computed at the erection contractor's normal rates and prices.

Prior to the departure of the erection crew, purchaser will inspect the work, and if the work is in conformity with the terms and provisions of this order, purchaser shall accept the same and shall deliver to the erection crew foreman, at the time when the latter states to the purchaser that the work is complete, and, in any event, prior to departure of the crew, a signed statement of acceptance. If purchaser declines to sign such statement, then purchaser before departure of the crew, shall inform seller in detail by telephone of the reasons for such declination. If, before departure of the crew, purchaser fails so to notify seller, or if purchaser fails to make such inspection, the work shall be conclusively deemed to have been accepted by purchaser.

RESERVATION OF TITLE - The equipment ordered herein and any equipment added by amendments hereto is and shall always remain personal property irrespective of the installation thereof.

Upon request of seller, purchaser shall furnish to seller a waiver of landlord's lien or other lien upon the equipment.

Title to and right to repossession of the equipment shall remain in seller until the entire purchase price, whether represented by promissory notes, open account, judgment or otherwise, shall have been fully paid in cash.

PAYMENT ARRANGEMENTS - If this order provides for payment of the balance in deferred installments, purchaser, prior to shipment of the equipment, and at such time as requested by seller, will execute either a conditional sales contract or a chattel mortgage or other instrument of security, as designated by seller, and a promissory note, both in such form as shall be prescribed by seller, and will obtain such guarantees of payment as required by seller.

If in the judgment of seller, either before or after manufacture or shipment of the equipment, the financial responsibility of purchaser is such as to indicate inability to pay its obligations, including those hereunder, as they mature, seller upon giving written notice to purchaser may require payment in full or of a specified part of the balance of the purchase price within ten (10) days after the giving of such notice, irrespective of the terms of payment stated herein.

MISCELLANEOUS - Purchaser agrees to indemnify seller against all claims, whether on account of negligence or otherwise, except those asserted by seller's employees, arising out of or resulting from the erection, operation or use of the equipment.

All prices are net. Prices on items manufactured by seller are f.o.b. Quincy, Illinois, and on equipment manufactured by others are f.o.b. point of shipment. In the absence of specific shipping instructions herein, the method of shipment and the carrier shall be selected by seller.

ACCEPTANCE - This proposal and acceptance when signed by purchaser shall constitute an order by purchaser, which shall be deemed to be accepted by seller when seller mails to purchaser its standard form of acknowledgment. Seller reserves the right in its acknowledgment to change prices and specifications herein to seller's prices and specifications in effect on the date of the acknowledgment. If the prices or specifications in the acknowledgment differ from those herein, purchaser may cancel this order by written notice by certified mail to seller within seven (7) days after receipt of the acknowledgment. In case of such cancellation, seller shall refund to purchaser any payments previously made on account of the purchase price, without interest. If written notice is not received from purchaser, as above provided, then such change shall be deemed to be accepted. The order together with the acknowledgment above mentioned shall constitute the entire contract between the parties, and shall be changed only by written agreement of the parties. The banking of, or other use of the down payment, shall not constitute acceptance of this order by seller. The contract shall be governed by the laws of the State of Illinois.

Purchaser acknowledges receipt of a copy of this order as signed by it.



PRICE LIST

(Effective July 1, 1960)

This is your price list for items listed in your Gates catalog. Each price has been carefully checked for accuracy. Rapidly changing conditions as well as the human element, will necessitate price changes or corrections from time to time. Therefore, the prices herein are subject to change without notice. — All prices are F.O.B. Quincy, Illinois. No charge is made for domestic packing. A small charge is made for export packing where overseas shipment is involved. Consistent with highest quality standards, we feel sure you will find the price on the items of your interest, both reasonable and fair.

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
11	M5913	BC-50C	Broadcast transmitter, 50KW, with tubes	\$87,675.00
		TK367	Tube kit, 100% for BC-50C	6,170.75
		TK368	Tube kit, FCC spares for BC-50C	3,240.12
		A30866	Spare crystal and holder for BC-50C	70.00
13	M5967	BC-100C	Broadcast transmitter, 100KW, with tubes	(on application)
		TK376	Tube kit, 100% for BC-100C	(on application)
		TK377	Tube kit, FCC spares for BC-100C	(on application)
		A30866	Spare crystal and holder for BC-100C	70.00
17	M4779	BC-20B	Broadcast transmitter, 20KW, with tubes	39,985.00
			NOTE: Catalog states above as BC-20P, in error	
		TK229	Tube kit, 100% for BC-20B	2,068.00
		TK361	Tube kit, FCC spares for BC-20B	995.60
21	M5383	BC-10P	Broadcast transmitter, 10KW with tubes	16,995.00
			Broadcast transmitter, 10KW, with silicon dry rectifiers and tubes	(on application)
	M6003	BC-10P	Tube kit, 100% for M5383 above	1,101.25
		TK314	Tube kit, FCC spares for M5383 above	576.10
		TK315	Spare crystal and holder for BC-10P	70.00
		A30866	Tube kit, 100% for M6003 above	957.25
26	M5565	BC5P-2	Tube kit, FCC spares for M6003 above	505.78
		TK381	Broadcast transmitter, 5KW, with tubes	13,895.00
	M5932	BC5P-2S	Broadcast transmitter, 5KW, with silicon dry rectifiers and tubes	15,090.00
		TK382		

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
26 (cont'd)	M5190A	TK321	Tube kit, 100% for M5565 above	745.50
		TK322	Tube kit, FCC spares for M5565 above	497.00
		TK363	Tube kit, 100% for M5932 above	670.95
		TK364	Tube kit, FCC spares for M5932 above	460.23
		A30866	Spare crystal and holder for BC5P-2/S	70.00
			Complete extra cubicle for Conelrad and/or standby, with tubes	3,445.00
	M5969		Inbuilt Conelrad in BC5P-2/S transmitter	(on application)
32	M5393	BC-IT	Broadcast transmitter, 1KW, with tubes	4,595.00
		TK287	Tube kit, 100% for BC-IT	271.50
		TK288	Tube kit, FCC spares for BC-IT	136.95
		A30866	Spare crystal and holder for BC-IT	70.00
33	M5790	BC-IT	Broadcast transmitter, 1000/250 watts for Class IV operation, with tubes	4,670.00
			NOTE: For spare tubes and crystal, see prices Page 32 above.	
36	M5554	BC-500T	Broadcast transmitter, 500 watts, with tubes	4,125.00
		TK300	Tube kit, 100% for BC-500T	216.50
		TK307	Tube kit, FCC spares for BC-500T	78.08
		A30866	Spare crystal and holder for BC-500T	70.00
			Kit, to increase BC-500T to 1KW	459.00
39	M5627	BC-250T	Broadcast transmitter, 250 watts, with tubes	3,195.00
		TK306	Tube kit, 100% for BC-250T	154.10
		TK307	Tube kit, FCC spares for BC-250T	78.08
		A30866	Spare crystal and holder for BC-250T	70.00
			Kit, to increase BC-250T to BC-500T	1,130.00
40	M5637 M5638		Kit, to increase BC-250T to BC-IT	1,670.00
		GY-1000B	Packaged radio station	6,483.00
		GY-1000BRDC	Packaged radio station w/remote control	7,525.00
		GY-500B	Packaged radio station	6,018.00
		GY-500BRDC	Packaged radio station w/remote control	7,035.00
41		GY-250B	Packaged radio station	5,088.00
		GY-250BRDC	Packaged radio station w/remote control	6,099.00
			NOTE: All packaged stations include tubes.	
41			Conelrad	(on application)
43	M3760A M3074	BC-250GY	Broadcast transmitter, 250 watts, with tubes	2,750.00
			Tube kit, 100% for BC-250GY	157.90
		TK201	Tube kit, FCC spares for BC-250GY	91.76
		JK57M	Spare crystal and holder for BC-250GY	60.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
47	M5833	FM-10A	Broadcast transmitter, 10,000 watts FM, with tubes	18,450.00
		TK349	Tube kit, 100% for FM-10A	1,349.48
		TK350	Tube kit, FCC spares for FM-10A	1,196.82
51	M5598	FM-5B	Broadcast transmitter, 5000 watts FM, with tubes	10,950.00
		TK313	Tube kit, 100% for FM-5B	756.80
		TK319	Tube kit, FCC spares for FM-5B	408.90
53	M5597	FM-1B	Broadcast transmitter, 1KW FM, with tubes	5,195.00
		TK312	Tube kit, 100% for FM-1B	164.00
		TK318	Tube kit, FCC spares for FM-1B	92.25
55	M5596	FM-250B	Broadcast transmitter, 250 watts FM, with tubes	3,150.00
	M5596	FM-250C	Broadcast transmitter, 250 watts FM, special frequency, with tubes (State frequency and bandwidth when ordering.)	3,390.00
		TK311	Tube kit, 100% for FM-250B and FM-250C	82.90
		TK317	Tube kit, FCC spares for FM-250B and FM-250C	72.05
57	M5595	BFE-50B	Broadcast transmitter, 50 watts FM, with tubes	1,695.00
		TK309	Tube kit, 100% for BFE-50B	45.95
		TK360	Tube kit, FCC spares for BFE-50B	32.45
	M5594	BFE-10B	Broadcast transmitter, 10 watts FM, with tubes	1,365.00
		TK308	Tube kit, 100% for BFE-10B	34.00
		TK359	Tube kit, FCC spares for BFE-10B	25.35
59	M5633A		Multiplex single sub-carrier with tubes	(on application)
	M5633B		Multiplex dual sub-carrier with tubes	(on application)
		TK383	Tube kit, 100% for M5633A	19.23
		TK384	Tube kit, 100% for M5633B	27.91
60	M5796		FM Exciter with tubes	1,195.00
		TK308	Tube kit, 100% for FM Exciter	34.00
		JK07E	Spare crystal and oven for FM Exciter	78.00
65	M5491	BT-5CL	Television transmitter, 5000 watts, with tubes	35,995.00
		TK341	Tube kit, 100% for BT-5CL	1,437.63
		TK342	Tube kit, FCC spares for BT-5CL	886.32
	M5892		Optional color video filter with power supply	795.00
	M5777	BT-5CH	Television transmitter, 5000 watts with tubes	35,995.00
		TK343	Tube kit, 100% for BT-5CH	1,502.33
		TK344	Tube kit, FCC spares for BT-5CH	935.77
	M5892		Optional color video filter with power supply	795.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE	
68	M5901	BT-500CL	Television transmitter, 500 watts, with tubes	17,750.00	
		TK357	Tube kit, 100% for BT-500CL	372.15	
		TK365	Tube kit, FCC spares for BT-500CL	240.27	
	M5892		Optional color video filter with power supply	795.00	
	M5902	BT-500CH	Television transmitter, 500 watts, with tubes	17,750.00	
		TK358	Tube kit, 100% for BT-500CH	240.27	
		TK365	Tube kit, FCC spares for BT-500CH	436.85	
	M5892		Optional color video filter with power supply	795.00	
	70	M5364A	BT-100AL	Television transmitter, 100 watts, with tubes	6,150.00
			TK289	Tube kit, 100% for BT-100AL	257.65
TK372			Tube kit, FCC spares for BT-100AL	114.02	
M5113A		BT-100AH	Television transmitter, 100 watts, with tubes	6,150.00	
		TK354	Tube kit, 100% for BT-100AH	193.30	
		TK372	Tube kit, FCC spares for BT-100AH	114.02	
		JK07E	Spare crystal and oven (audio)	70.00	
		JK09E	Spare crystal and oven (visual)	65.00	
71		320-BV	Dage vidicon live camera, less lens	1,890.00	
	320-BF	Dage film camera, less lens	1,275.00		
		LENSES FOR TV CAMERAS:			
	A-069-2	1/2" 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 sunshade	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, 3/4" to 3" manually operated, Pan Cinor	410.00		
72	EPS-21	Dage TV system, less cameras			
		—with control for 1 camera	2,895.00		
		—with control for 2 cameras	5,635.00		
		—with control for 3 cameras	8,355.00		
74	C-466-1	Camera cable	\$60 + 75c/ft.		
	A-2482	Master monitor	1,000.00		
	A-2500	Video monitor	515.00		
	A-2541	Master waveform monitor	790.00		
	A-2576	Camera control & waveform monitor assembly	1,100.00		
	PC	Projector control	225.00		

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE	
74 (cont'd)	521B	A-3966-2	Switcher-fader amplifier (includes parts A-2584-1 and A-3966-2)	845.00	
75		ETS-1	Dage TV system, less camera —for single camera chain —for dual camera chain —for triple camera chain	4,022.00 5,096.00 5,705.00	
77		A-2531 A-2530 A-2532	Camera control panel Video processing assembly Switcher	600.00 (on application) 345.00	
78		431-A 431-B 334	Dage Twin-generator Dage Twin-generator Dage miniature TV camera	3,000.00 3,150.00 5,000.00	
79		330A 330C 322A 322C 323 349 343 344 344A 345 348 335ER GR-973 GR-974 GR-975 GR-976 614CBVM 3B 35A 31L 31R 63A 62A	Selectroslide Selectroslide Selectroslide Selectroslide Spare turret Lens, Support Lens for Selectroslide Lens for Selectroslide Lens for Selectroslide Lens for Selectroslide Lens for Selectroslide VHF-UHF TV monitor Professional Junior spring head tripod Model B triangle Friction head tripod Carrying case Projector Telejector Manual control unit Additional turret Additional turret Mounting shelf Multiplexer	1,048.00 1,132.00 268.00 322.00 49.60 15.00 42.00 48.00 63.00 75.00 110.00 2,700.00 200.00 26.00 150.00 18.00 2,400.00 695.00 295.00 14.00 14.00 130.00 245.00	
LENSES FOR TV CAMERAS:					
		A-069-2	1/2" 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 sunshade	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, 3/4" to 3" manually operated, Pan Cinor	410.00	

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
80		44N3TVG	Spotlight	29.50
		44N6TVG	Spotlight	137.20
		44N8TVG	Spotlight	67.50
		44N12TVG	Spotlight	129.00
		1420CR	Floor stand	39.00
		1421CR	Floor stand	42.00
		44NP8G	Pole-Op	95.00
		44	Handle and loop	17.50
			100 watt bayonet base lamp	1.50
			150 watt bayonet base lamp	2.95
		order lamps by description as to the right	500 watt medium pre-focus lamp	5.50
			750 watt medium pre-focus lamp	6.60
			1000 watt mogul pre-focus lamp	7.10
			1500 watt mogul pre-focus lamp	12.10
			2000 watt mogul pre-focus lamp	14.35
		BP6	2000 watt mogul pre-focus lamp	14.00
		1365EG	Kliegl light	58.75
		1365EG-IRS	Kliegl light	75.25
		1366EG	Kliegl light	122.50
		1366EG-IRS	Kliegl light	139.00
		1174G	Kliegl light	406.00
		1178G	Kliegl light	629.00
		TV-1155G	Scoop light	44.50
		TV-111	Hanger	46.00
		TV-112	Hanger	46.00
		TV-113	Hanger	70.50
		963	Video patch panel	215.00
		965	Looping plug	6.50
		967A	Patch cord	6.50
		967B	Patch cord	6.75
		for:	LAMP SIZES:	
		44N3TVG	100/150W bayonet base lamp	2.95
		44N6TVG	500/750W T20 medium pre-focus base lamp	6.60
		44N8TVG	1000, 1500, 2000W G40 mogul pre-focus lamp	12.10
		44NP8G	1000, 1500, 2000W G40 mogul pre-focus lamp	14.35
		44N12TVG	2000W G48 mogul pre-focus lamp	14.00
81			TV monitor, 14" CMB	
			— C	585.00
			— R	575.00
			— N	505.00
			TV monitor, 17" CMB	
			— C	590.00
			— R	580.00
			— N	510.00
			TV monitor, 21" CMB	
			— C	630.00
			— R	610.00
			— N	530.00
		CNA8/C	TV monitor, 8" in portable case	325.00
		CNA8/N	Chassis only	275.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
81 (cont'd)		CNA8/2R CLB	Rack assembly TV monitor, 14" rack mount	595.00 310.00
82	M5504 M5471	TV-100L TV-100H TV-500L TV-500H I302 I304 I306 I308 I312	Antenna Antenna Antenna Antenna Multi-V antenna Multi-V antenna Multi-V antenna Multi-V antenna Multi-V antenna	1,600.00 1,600.00 2,500.00 2,275.00 550.00 1,150.00 2,400.00 3,200.00 7,800.00
			JANPRO ANTENNAS:	
		JA-2	(not listed in catalog) Power gain 1.8. Power rating 5KW or less	600.00
		JA-4	As listed in catalog	1,250.00
		JA-8	As listed in catalog	3,350.00
		JA-12	As listed in catalog	6,900.00
		JA-16	(not listed in catalog) Power gain 15.8. Power rating 55KW.	9,950.00
		FM-11	Broad band antenna	125.00
		FM-22	Broad band antenna Electric generating sets	335.00 (on application)
83	M5178 M5179 M5309A M5309B	44	Antenna coupler Antenna coupler Antenna coupler Antenna coupler Antenna coupler Antenna couplers, high power	335.00 175.00 175.00 595.00 875.00 (on application)
84	M3935 M3936 M3937 M3938		Tower choke Tower choke Tower choke Tower choke	60.00 81.50 95.75 115.00
		A-2100 A-2101 A-2102 A-2103 A-1970 A-1971 A-1972 A-1973	Austin tower choke Austin tower choke Austin tower choke Austin tower choke Austin tower choke Austin tower choke Austin tower choke Austin tower choke	303.00 313.00 303.00 313.00 338.00 354.00 338.00 354.00
	M3073 M4561A M5634 M5573 M3283 M3383 M3133 M3386 M3294 M3294B M3294D		Isolation coil, includes M4561A coil Isolation coil only Isolation unit, includes M5573 coil Isolation coil Phase sampling loop Remote metering kit Remote metering kit Remote metering kit Remote metering kit Remote metering kit Remote metering kit	237.50 150.00 195.00 110.00 115.00 85.00 85.00 85.00 75.00 75.00 75.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
84 (cont'd)	M5334 M5335 M3759 M2765B		Remote metering kit Remote metering kit Diode only, less meter Diode only, less meter	79.50 79.50 70.00 82.00
85			Directional phasors	(on application)
87		GY-60B TK302	Complete accessory cabinet Tube kit	1,893.00 57.02
89	M4990	TK281	Frequency monitor with tubes Tube kit	795.00 16.50
	M5631 M5549		Remote frequency meter on panel Whip antenna and coupler	77.50 52.50
91	M5693		Modulation monitor, broadcast model with tubes	525.00
		TK345	Tube kit	20.66
	M5837		Remote meter panel NOTE: Catalog states M5834, which is error. Order M5837.	65.00
92	M5774		Modulation monitor, high freq. model with tubes	720.00
		TK346	Tube kit	32.71
	M5836B		Remote meter panel	65.00
93		108D 108E 108F 335BR 120D	Phase monitor Phase monitor Phase monitor FM monitor Field meter, less batteries	700.00 725.00 750.00 1,695.00 850.00
94	M4055	CCD2	Transmitter control console	850.00
96	M5862	RDC-10AC	Basic remote unit, 19 metering positions NOTE: Above unit listed for special remote control requirements by using accessories on Page 99. Items B thru J are described and priced on Page 99. Item K standard equipment in RDC- 10 models and not available separately. See M5145, Page 99, for separate tower light indicator.	796.00
	M5876		Complete remote control package, 250 watts	961.00
	M5877		Complete remote control package, 500 watts	961.00
	M5878		Complete remote control package, 1000 watts	966.00
98	M5870	RDC-200A	Remote control system, 40 metering positions	1,550.00
	M5145		Extra tower light indicator	19.95
99	M5270 M5631		Frequency monitor extension unit Extension meter, use with Gates M4990 monitor	225.00 77.50

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
99 (cont'd)	M5144A		RF amplifier with tubes	295.00
	M5936		Automatic sequence switcher	125.00
	M4703-A		Motor/rheostat	100.00
	M4703-B		Motor/rheostat	100.00
	M4703-C		Motor/rheostat	105.00
	M5066		Tuning motor	85.00
	M5145		Tower light unit	19.95
	M5631		Remote meter and panel	77.50
	M5837		Remote meter only	65.00
	M5210		Monitor extension meter	60.00
	M5206		Monitor extension meter	65.00
	M5208		Monitor extension meter	65.00
	M5207		Monitor extension meter	65.00
	M5209		Monitor extension meter	65.00
	M3759		Antenna diode	70.00
	M2765B		Antenna diode	82.00
	M4801		Relay assembly	39.50
	M4806		Relay assembly	50.00
	M5249		Relay assembly	35.00
	M5248		Relay assembly	39.50
	M4719A		Plate voltage unit	13.95
	M4848A		Output loading kit	173.00
	M4791		FM amplifier	295.00
	M4845		FM indicator	55.00
	M5129		Overload relay	32.50
	M4825		Rectifier	43.00
	M4720		Plate current unit	10.50
	M4800		Tuning motor assembly	85.00
100	M5508		VHF dummy antenna (heat exchanger)	(on application)
	M3968	DU-551	Dummy antenna	215.00
	M3968A	DU-570	Dummy antenna	215.00
	M5343	DU-151	Dummy antenna	105.00
	M3483	DU-170	Dummy antenna	105.00
			Dummy antenna, air cooled	(on application)
	M5645		VHF dummy antenna	35.00
101			Water cooled dummy antenna (all models)	(on application)
			TRANSFORMERS FOR 250 WATTS:	
		BM-1	Modulation transformer	37.50
		BR-1	Modulation reactor	57.30
		BD-1	Driver transformer	20.70
		AP-7235	Power transformer	136.00
		CG-109	Swinging choke	27.00
		CG-105	Smoothing choke	15.00
			TRANSFORMERS FOR 500 WATTS:	
		AM-30613	Modulation transformer	178.00
		AC-10650	Modulation reactor	136.00
		AS-3172C	Driver transformer	177.45
		AP-12001E	Power transformer	149.00
		CG-109	Swinging choke	27.00
		CG-105	Smoothing choke	15.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
101 (cont'd)		AM-30469	TRANSFORMERS FOR 1000 WATTS: Modulation transformer	251.00
		AC-10465	Modulation reactor	167.00
		AS-3172C	Driver transformer	177.45
		AP-10459E	Power transformer	194.00
		AC-10458	Swinging choke	146.00
		AC-10457	Smoothing choke	39.00
			TRANSFORMERS FOR 5000 WATTS:	
		AM-7718E	Modulation transformer	765.00
		AM-7718M	Modulation transformer	1,355.00
		AC-7719E	Modulation reactor	605.00
102		AC-7719M	Modulation reactor	1,008.00
		AP-8000E	Power transformer	577.50
		AP-8000M	Power transformer	1,019.00
		AC-3143E	Input or smoothing choke	104.00
		AS-3172C	Driver transformer	177.45
			TRANSFORMERS FOR 10,000 WATTS:	
		AM-30643	Modulation transformer	1,150.00
		AM-32886	Modulation transformer	1,670.00
		AC-3168E	Modulation transformer	835.00
		AC-32887	Modulation reactor	937.50
		AS-3172C	Driver transformer	177.45
		AP-3090E	Power transformer	1,190.00
		AP-3090M	Power transformer	1,445.00
		AC-3147E	Input or smoothing choke	200.00
			TRANSFORMERS FOR 20KW:	
		AM-8674M	Modulation transformer	3,325.00
		AC-8675M	Modulation transformer	2,800.00
		AS-8672E	Driver transformer	205.00
		AC-8673M	Filter reactor	830.00
			TRANSFORMERS FOR 50KW:	
		AM-11788M	Modulation transformer	5,644.00
		AC-11787M	Modulation reactor	5,224.00
		AM-11788M	Driver transformer	5,644.00
		AP-11785M	Power transformer	1,885.00
		AC-11786	Filter reactor	1,129.00
		AF-7782E	Filament transformer	57.00
		AF-10434E	Filament transformer	136.00
		AF-11856E	Filament transformer	146.00
		AF-30099E	Filament transformer	94.00
		AF-10432E	Filament transformer	136.00
		AF-10456K	Filament transformer	41.00
		AF-11857E	Filament transformer	232.00
		AI-3002U	Audio input transformer	50.00
		AI-10379T	Audio input transformer	18.00
		AI-10386	Audio input transformer	18.00
		AO-10427T	Audio output transformer	16.00
		AO-10864T	Audio output transformer	20.00
		114A	Audio repeater transformer	22.14

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
103		87FA4634	Inductor	51.50
		6FB0854	Inductor	31.25
		10FB0855	Inductor	31.50
		13FB0856	Inductor	32.50
		18FB1754	Inductor	36.00
		26FB1755	Inductor	36.50
		35FB1756	Inductor	38.00
		58FB2845	Inductor	45.75
		78FB2846	Inductor	48.00
		128FB4635	Inductor	61.50
		6FC0854	Inductor	36.00
		10FC0855	Inductor	34.00
		13FC0856	Inductor	34.75
		17FC1654	Inductor	42.25
		24FC1655	Inductor	47.25
		32FC1656	Inductor	46.00
		42FC2266	Inductor	44.00
		67FC2856	Inductor	71.50
		78FC2568	Inductor	76.00
		10FBT1066	Inductor	62.00
		32FBT1658	Inductor	96.50
		45FBT2158	Inductor	162.50
		65FBT2559	Inductor	130.00
		17FCT1178	Inductor	97.25
		35FCT1779C	Inductor	155.50
		6VC0854	Variable inductor	59.25
		15VC1444	Variable inductor	58.25
		26VC2144	Variable inductor	76.30
		16VB1544	Variable inductor	55.25
		30VB2344	Variable inductor	72.00
		105VB3735	Variable inductor	73.90
		LC4	Clip	.39
		LC6	Clip	.68
		LC8	Clip	.98
		RC6	Clip	2.50
		RC8	Clip	2.90
		M3401F	Dial for variable coil	15.00
		M5521	Dial for variable coil	30.00
104		order capacitors by description	G1 MICA CAPACITORS:	
			.00001 thru .00005 mfd.	22.92
			.0001 and .0002 mfd.	24.36
			.0004 mfd.	26.61
			.0005 mfd. and .001 mfd.	27.99
			.00155 and .002 mfd.	29.34
			.003 thru .005 mfd.	30.36
			.006 thru .02 mfd.	30.90
			G2 MICA CAPACITORS:	
			.0001 thru .005 mfd.	39.33
			.006 thru .02 mfd.	41.49

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
104 (cont'd)		 order capacitors by description	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 thru .0004 mfd. 302.40 .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: .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	

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
104 (cont'd)		order capacitors by description	.01 mfd. .05 mfd. 0.1 mfd. 0.25 mfd. 0.5 mfd. 1.0 mfd.	33.12 37.11 29.16 26.76 31.53 49.11
			TYPE E MICA CAPACITORS:	
		E-1245	.00005 mfd., 12,500V	10.80
		E-1231	.00001 mfd., 12,500V	10.80
		E-12325	.00025 mfd., 12,500V	10.80
		E-1235	.0005 mfd., 12,500V	10.80
		E-1221	.001 mfd., 12,500V	10.80
		E-12215	.0015 mfd., 12,500V	12.60
		E-1222	.002 mfd., 12,500V	15.00
		E-1023	.003 mfd., 10,000V	16.20
		E-1024	.004 mfd., 10,000V	17.40
		E-1025	.005 mfd., 10,000V	19.44
		E-721	.001 mfd., 7,000V	9.66
		E-722	.002 mfd., 7,000V	12.60
		E-723	.003 mfd., 7,000V	13.80
		E-711	.01 mfd., 7,000V	20.40
		E-3524	.004 mfd., 3,500V	12.60
		E-3525	.005 mfd., 3,500V	12.78
		E-3511	.01 mfd., 3,500V	19.44
		E-3512	.02 mfd., 3,500V	19.44
		E-3515	.05 mfd., 3,500V	22.56
		E-215	.05 mfd., 2,000V	19.32
		E-201	.1 mfd., 2,000V	22.56
			TYPE H MICA CAPACITORS:	
				(priced on catalog page)
			FILTER CAPACITORS:	
		7106-2	2 mfd., 600V	4.29
		7106-4	4 mfd., 600V	5.46
		7106-8	8 mfd., 600V	8.10
		7106-10	10 mfd., 600V	9.09
		7110-2	2 mfd., 1000V	4.95
		7110-4	4 mfd., 1000V	6.27
		7110-8	8 mfd., 1000V	9.09
		7110-10	10 mfd., 1000V	10.08
		7120-2	2 mfd., 2000V	6.45
		7120-4	4 mfd., 2000V	9.09
		7120-8	8 mfd., 2000V	15.03
		7120-10	10 mfd., 2000V	18.33
		7130-2	2 mfd., 3000V	15.03
		7130-4	4 mfd., 3000V	22.11
		7130-8	8 mfd., 3000V	37.41
		7140-2	2 mfd., 4000V	23.16
		7140-4	4 mfd., 4000V	36.00
		7140-6	6 mfd., 4000V	51.45

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
104 (cont'd)		7150-2	2 mfd., 5000V	30.60
		7150-4	4 mfd., 5000V	50.25
		7160-1	1 mfd., 6000V	29.40
		7160-2	2 mfd., 6000V	89.76
		7175-1	1 mfd., 7000V	65.19
		7175-2	2 mfd., 7000V	100.32
		TK70040	4 mfd., 7000V	150.48
105	M3327		Line bracket	31.50
	M3864		Center post assembly	18.50
	M3328		End plate	38.00
	M3322		Horn gap	48.00
	M2870-D		Feedthru bowl	13.95
	M3254		Feedthru bowl	13.95
	M5280		Feedthru bowl	9.00
106	M5281		Feedthru bowl	9.00
		RG-8U	Coaxial cable	per ft. .14
		RG-11U	Coaxial cable	" .13
		RG-17U	Coaxial cable	" .65
		RG-19U	Coaxial cable	" 1.12
		RG-20U	Coaxial cable (same as RG-19U but armored)—special price	" .65
		RG-22U	Coaxial cable	" .26
		H-O	Coaxial cable, Helix type	" 1.50
		H-I	Coaxial cable, Helix type	" 3.40
		20-T	End terminal, Helix	30.00
		21-R	End terminal, flange, Helix	50.00
		83	Air-dielectric coaxial cable	.80
		1701-GV	End terminal	12.00
		1701-P	End terminal	8.00
		1701-R	End terminal	10.00
		S-450	Air-dielectric coaxial cable	1.35
		1703AGV	End terminal	16.00
		1703-AP	End terminal	11.00
		1703-AR	End terminal	14.00
		451	Air-dielectric coaxial cable	90.00
		1211	Air-dielectric coaxial cable, any special length	(on application)
		1051-M	Right angle elbow	50.00
		1351	Gas inlet coupling	12.50
		T-1551	Clamp connector	15.00
		13942	End terminal	46.50
		GR-10	#10 soft drawn copper ground wire per lb.	.61
			NOTE: Copper ground wire prices will vary upward and downward in accordance with market.	
			Copper ground strap, 2" (for 100 ft. pkg.)	22.68
			Copper ground strap, 4" (for 50 ft. pkg.)	22.68
		GR8R	Ground rod	4.35
		GR24SC	Ground screen	51.00
		878	Dry air pump	48.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
106 (cont'd)		1910	Dehydrator, automatic	450.00
		6600	Gas distribution manifold	14.00
				(add \$12.00 per coax outlet)
		OB-20	Single obstruction light	14.50
		OB-21	Single obstruction light	14.50
107		OB22-4	Double obstruction light	26.60
		OB22P-4	Double obstruction light	30.00
		KG114-3	Code beacon	293.35
		RG114-4	Code beacon	293.35
		100A21-TS	Replacement lamp	.42
		111A21-TS	Replacement lamp	.42
		500PS-40	Beacon lamp	2.50
		620PS-40	Beacon lamp	2.50
			Tower lighting kit, Spec. A1 (exposed wiring)	
			Kit 1E-2A, less photo-cell unit	80.00
			Kit 1E-2AP, includes photo-cell unit	160.00
			Tower lighting kit, Spec. A2 (exposed wiring)	
			Kit 2E1-2A, includes beacon flasher, less photo-cell unit	493.00
			Kit 2E1-2AP, includes beacon flasher and photo-cell flasher LC-2074A	600.00
			Tower lighting kit, Spec. A3 (exposed wiring)	
			Kit 3E1-4A, includes beacon flasher, less photo-cell unit	546.70
			Kit 3E1-4AP, includes beacon flasher, and photo-cell unit LC-2074A	660.00
			Tower lighting kit, Spec. A4 (conduit wiring)	
			Kit 4C2-6A, includes 2-circuit beacon flasher, less photo-cell unit	1,150.00
			Kit 4C2-6AP, includes 2-circuit beacon flasher and photo-cell control LC-2072 or LC-2073	1,240.00
			NOTE: Kits A2, A3 and A4 are shipped freight prepaid to common carrier shipping point nearest cus- tomer.	
			NOTE: Price per tower foot is for open wire connecting cable.	
		LC-2077	Flasher and photo-cell unit	247.20
		LC-2076	Flasher and photo-cell unit	282.50
		BF-31	Beacon flasher	60.00
		BF-32	Beacon flasher	85.30
		63305C	Photo-cell unit	55.00
		63306C	Photo-cell unit	55.00
		LC-2074	Flasher unit	158.90
		LC-2072	Flasher unit	178.90
		RTA-300	Rhombic antenna	440.00
		RTL-300	Transmission line for Rhombic antenna	451.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
107 (cont'd)		TDL-340 DTA-430 DTL-400	Dissipation line for Rhombic antenna Doublet transmitting antenna Transmission line for Doublet	198.00 110.00 407.00
108			Utility towers	(price based on height & size)
113	M5236A	TK294	Dualux console with tubes Tube kit	1,795.00 56.50
	M5303		Intercom sub-station	16.00
	M5372		Desk	105.00
	M5304	AK-11939	Extra preamplifier Extra relay	51.50 13.50
115	M5133A	AK-11939	Gatesway console with tubes Extra relay	1,475.00 13.50
	M5303		Intercom sub-station	16.00
	M5371		Desk	97.50
		TK290	Tube kit	44.50
	M5304		Extra preamplifier	51.50
121	M5526	TK282	Yard console with tubes Tube kit	1,095.00 41.00
	M5304		Extra preamplifier	51.50
		AK-12626	Extra muting relay	13.50
	M5528		Desk (only available when purchased with Yard)	35.00
		A-30601	Speaker matching transformer	3.75
	M5303		Intercom sub-station	16.00
125	M5381	TK270	Studioette console with tubes Tube kit	895.00 28.25
	M5304		Extra preamplifier	51.50
		AK-12626	Extra muting relay	13.50
		A-30601	Speaker matching transformer	3.75
128	M5421A	TV-10	Television console with tubes	1,895.00
		TK295	Tube kit	56.30
	M5304		Extra preamplifier	51.50
129	M4309	CSE-9	Master preset console	(on application)
			Sound effects wagon, less loudspeaker	5,500.00
	M4364	LSB-2	Loudspeaker assembly	358.00
		TK155	Spare tube kit	66.40
132	M5739	CB-500	Transcription turntable	245.00
	M5739A	CB-500A	Transcription turntable	255.00
133	M5820	CB-510	Transcription turntable	385.00
	M5820A	CB-510A	Transcription turntable	412.50
	M5828	CB-525	Transcription turntable	449.00
	M5828A	CB-525A	Transcription turntable	480.00
	M5830		Stepdown transformer	15.00
	M5269	CAB-6	Cabinet only	90.00
135	M5274	CB-4	Desk	350.00
		CB-4M	Desk w/cutouts for CB-500 switches and wired	415.00
		CB-4N	Desk w/two CB-510A turntables wired	1,217.50

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
135 (cont'd)		CB-4P	Desk w/two CB-500 turntables, uses Gray 108-C arms (106-SP listed in catalog in error)	1,167.00
		CB-4R	Desk equipment w/console	2,693.00
		CB-4S	Desk equipment w/console	2,642.00
		NOTE: Models CB-4P and CB-4S do not include preamplifiers for pick- ups. If preamplifiers desired, order M5530, Page 170.		
137	M5798	CB-77	Transcription turntable	225.00
	M5798A	CB-77-50	Transcription turntable	235.00
	M5890	CB-88	Transcription turntable	366.00
	M5890A	CB-88A	Transcription turntable	382.00
	M5943	CB-99	Transcription turntable	867.00
	M5943A	CB-99A	Transcription turntable	899.00
	M5941	CB-880	Transcription turntable	441.00
	M5941A	CB-880A	Transcription turntable	457.00
	M5937	CAB-8	Single chassis cabinet only	75.00
	M5938	DTT-2	Dual chassis cabinet only	135.00
138		108C	Transcription arm	39.95
		212	Transcription arm	36.50
		602C	Equalizer	57.50
		4G-050	Pickup cartridge	9.95
		4G-052	Pickup cartridge	19.95
		4G-053	Pickup cartridge	30.95
		4G-040	Pickup cartridge	7.50
		4G-041	Pickup cartridge	7.50
		4G-061	Pickup cartridge	17.95
		4G-063	Pickup cartridge	17.95
		4GD-01S-02S	Pickup cartridge	12.95
		4GD-01D-02D	Pickup cartridge	22.50
		4GD-01D-02D	Pickup cartridge	33.50
		4GS-01D	Pickup cartridge	20.50
		4GS-02D	Pickup cartridge	20.50
		4GS-01S	Pickup cartridge	10.50
		4GS-02S	Pickup cartridge	10.50
		4G-01S	Pickup cartridge	2.00
		4G-02S	Pickup cartridge	2.00
		4G-03S	Pickup cartridge	2.00
		4G-01D	Pickup cartridge	9.95
		4G-02D	Pickup cartridge	9.95
		4G-03D	Pickup cartridge	9.95
		RPJ-01S	Pickup cartridge	2.00
		RPJ-02S	Pickup cartridge	2.00
		RPJ-03S	Pickup cartridge	2.00
		RPJ-01D	Pickup cartridge	9.95
		RPJ-02D	Pickup cartridge	9.95
		RPJ-04D	Pickup cartridge	10.50
		RPJ-005	Pickup cartridge	2.10
		RPJ-006	Pickup cartridge	2.10
		RPJ-001	Pickup cartridge	2.10
		RPJ-004	Pickup cartridge	10.50
		RPJ-002	Pickup cartridge	10.50
		RPJ-003	Pickup cartridge	10.50

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
138 (cont'd)		AI-504 RKP-009B GC-5	Adapter Replacement parts kit Stereo w/diamond .5 stylus	.73 .30 26.95
139	M5235	TK225	Preamplifier, equalized, with tubes Tube kit	79.50 2.56
	M5530 M5635		Preamplifier, 3-stage utility, with tubes Cue Sta-Level patch cabinet	89.50 410.00
143	M5735	ST-101 TK351	Spot Tape recorder Tube kit	995.00 8.75
	M5840		Extra tape roll	28.75
147	M5944 M5944A M5952 M5952A M5953 M5953A M5960 M5965		Cartrtape playback unit Cartrtape playback unit Recording panel Recording panel Switcher Switcher Remote panel Mounting box	520.00 520.00 345.00 345.00 134.50 134.50 39.75 6.50
148		F-300 F-300A F-300B F-300C F-300D F-300E F-300G F-600 F-600H F-1200 F-1200J F-1200K V-300 V-1200	Automatic tape cartridge Automatic tape cartridge Automatic tape cartridge Automatic tape cartridge Automatic tape cartridge Automatic tape cartridge Automatic tape cartridge Automatic tape cartridge (empty/no tape) Automatic tape cartridge Automatic tape cartridge (empty/no tape) Automatic tape cartridge Automatic tape cartridge Viking cartridge (empty/no tape) Viking cartridge (empty/no tape)	2.20 2.95 2.95 3.50 3.90 4.73 5.00 3.25 6.75 4.70 14.00 17.24 2.75 4.16
149	M5452		Auto-Trans	895.00
152	M5671		Nite-Watch automatic programming unit	2,945.00
	M5628 M5664 M5665		Nite-Watch, less cabinet for recorder Recorder panel Auto-Trans control switch box	2,895.00 97.50 22.50
153	M5429		Auto-Station complete with production unit and automatic playback unit	5,975.00
155	M3529B	SA-39B TK-150	Limiting amplifier with tubes Tube kit	425.00 19.86
157	M5167	TK-243	Sta-level with tubes Tube kit	242.50 15.00
160	M5546	TK-331	Level Devil program amplifier Tube kit	325.00 19.45

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
160 (cont'd)	M5881		Balanced set of (2) 5749 and (1) 12AU7 tubes, includes charge for testing and selecting	16.75
161	M5377		UniQue, rack mount	115.00
	M5377A		UniQue, desk mount	99.50
		TK305	Tube kit	2.35
	M5576		Program amplifier with tubes	165.00
		TK304	Tube kit	7.25
	M5575		Monitoring amplifier with tubes	189.00
		TK303	Tube kit	14.45
		A-30601	Speaker matching transformer	3.75
164	M4880-A		Dynamote with XL connectors and tubes	375.00
	M4880-B		Dynamote with P connectors and tubes	394.00
	M4933		Continumatic battery compartment	45.00
		TK183	Tube kit	7.31
	M5983		Spare batteries	8.85
		XL3-12	Microphone plug, Cannon	.99
		P3CG-12S	Microphone plug, Cannon	3.40
165	M5136		Biamote remote amplifier with tubes	215.00
		XL3-12	Microphone plug, Cannon	.99
		TK183	Tube kit	7.31
166	M5168		Twinsistor remote amplifier NOTE: If carrying case not desired, deduct \$4.95.	215.00
		XL3-12	Microphone plug, Cannon	.99
	M5339		Battery kit	12.75
	M5332		Microphone with swivel	44.65
		XL3-12	Microphone plug, Cannon	.99
		XL3-11	Output connector, Cannon	1.03
	M5350		Battery kit	2.25
167	M5531		Unimote remote amplifier with tubes	105.00
		XL3-12	Microphone plug, Cannon	.99
		TK280	Tube kit	5.50
168	M5500		Automote remote amplifier with tubes	195.00
		XL3-12	Microphone plug, Cannon	.99
	M5339		Battery kit	12.75
		XX30	Relay battery	2.75
169	M5311		Transmote with carrying case	145.00
	M5311-A		Transmote, less carrying case	136.75
	M5339		Battery kit	12.75
		XL3-12	Microphone plug, Cannon	.99
	M5312		Tubeless tube	39.75
	M5350		Battery kit	5.50
170	M5530		All-purpose utility amplifier with tubes	89.50
		TK280	Tube kit	5.50
		XL3-13	Chassis connector, Cannon	1.03
		XL3-12	Microphone plug, Cannon	.99

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
171 (cont'd)	M4174	PRE-4	Preamplifier with tubes	79.00
		TK112	Tube kit	3.50
	M4176	PGM-4	Program amplifier with tubes	105.00
		TK122	Tube kit	5.44
	M3982	PAS-1	Bridging controls (all models) Panel and shelf assembly	6.50 29.50
			NOTE: For special color, add \$2.00.	
	M4618	BA-20	Base and receptacle	5.95
	M4619	BA-21	Base and receptacle	6.25
172	M4175	MON-4	Monitoring amplifier with tubes	117.50
		TK121	Tube kit	6.89
	M5000	PWR-3	Power supply	89.00
		TK103	Spare tube kit	11.85
	M4453	PWR-10	Bias supply	9.25
	M4619	BA-21	Base and receptacle	6.25
173	M4577	V-22	Volume indicator panel	108.25
	M4242	SFP-1	Switch and fuse panel	38.50
		PJ-343	Jack strip	25.14
		PJ-341	Jack strip	42.75
	M4399	PD-1	Jack mat	8.75
	M4400	PD-2	Jack mat	8.75
	M4401	PD-3	Jack mat	8.75
		PJ-12	Patch cord	7.41
		PJ-13	Patch cord	7.59
		PJ-14	Patch cord	7.86
		PJ-15	Patch cord	8.07
174	M3664	SA-116	Equalizer	90.00
	M3665	SA-117	Equalizer	90.00
	M3666	SA-118	Equalizer	90.00
	M3667	SA-119	Equalizer	85.00
	M3668	SA-120	Equalizer	80.00
	M3669	SA-121	Panel to mount equalizer	10.00
	M4391	LE-1	Equalizer	25.00
	M4392	LE-2	Equalizer	91.00
	M4389	FSE-1	Equalizer	145.00
	M4390	FSE-2	Equalizer	145.00
175	M3706	RAK-1	Rack cabinet	120.00
	M3708	TRM-1	Single corner trim	10.00
	M3707	TRM-2	Double corner trim	11.00
	M3709	SP-1	Side panel	19.00
	M3710	SH-1	Shield	5.50
	M3711	SH-2	Shield	6.25
	M3712	BRK-1	Terminal board mounting bracket	3.40
	M4875	RAK-F-1	Ventilating fan	39.50
	M5527	RAK-7	Rack cabinet	85.00
	M5577		Joiner trim	12.50
176		200	Audio oscillator	138.00
		400	Noise and distortion meter	168.00
	M3625		Gain and measuring set	165.00
	M3663	SA-131	Complete proof of performance package	513.00
	M3626		Rectifier/pickup coil	42.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE	
177 (cont'd)		665	Microphone	90.00	
		664	Microphone	51.00	
		655C	Microphone	120.00	
		654	Microphone	60.00	
		636	Microphone	43.50	
		623	Microphone	34.20	
		635	Microphone	49.20	
		647	Microphone	49.50	
		315	Microphone	53.70	
		556S	Microphone	81.00	
		639	Microphone	250.00	
178			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	
		15TRX	Loudspeaker	149.00	
		15TRXB	Loudspeaker	79.00	
		SP12	Loudspeaker	66.00	
		848	Loudspeaker	49.50	
		847	Loudspeaker	30.60	
		SP8B	Loudspeaker	29.50	
		345	Shock mount	9.00	
		346	Shock mount	9.00	
		366	Shock mount	24.00	
		300	Clamp	6.00	
		524	Wind screen	4.80	
		335	Blast filter	3.30	
		418	Desk stand	6.00	
		418S	Desk stand	9.00	
		419	Desk stand	6.00	
		419S	Desk stand	9.00	
		420	Desk stand	12.00	
		423A	Desk stand	3.00	
		428	Desk stand	10.50	
	179		CS-33	Floor stand	8.10
			DS-7	Desk stand	3.00
			TS-6	Banquet stand	5.40
			MS-25	Floor stand	15.60
			MS-10C	Floor stand	5.85
			BB-1	Boom bracket	4.50
			BS-36	Boom stand	37.80
		BS-36W	Boom stand	43.80	
		AM-1	Studio warning light	19.00	
		AM-2	Studio warning light	19.00	
		AM-3	Studio warning light	19.00	
		AM-5	Studio warning light	19.00	
		AM-4	Studio warning light, "On Air"	16.60	
		RB-89	Clock (includes tax)	14.25	
		602	Clock (includes tax)	18.65	
		QT-7	Studio warning light, "On Air"	19.00	

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
179 (cont'd)	M5611	BA-200	Record-tape service cabinet	19.95
		BA-201	Dual head set	15.00
		107	Single head set	9.95
		35-3	Trim dual head set	6.60
			Trim head set	20.40
180		1203A	Loudspeaker	19.95
		A1-406B	Speaker cabinet	64.95
		A1-406M	Speaker cabinet	64.95
		A1-406U	Speaker cabinet	56.20
		A1-412	Speaker cabinet	37.95
		A1-411	Speaker cabinet	35.95
		A1-414	Speaker cabinet	32.95
		DWB-12	Wall baffle	8.40
		DWM-12	Wall baffle	8.40
		C12A-B	Corner baffle	10.95
		C12A-M	Corner baffle	10.95
		A18-A	Ceiling baffle	7.29
		6N	Disc recorder	1,245.00
		6NP	Disc recorder	1,323.50
		6NC	Disc recorder	1,383.50
		32M	Microgroove feed screw	76.50
		A-93	Recording amplifier	420.00
		ID-16	Cutting head	269.00
		ID-500	Cutting head	269.00
			Recording stylus (all types)	4.95
		ZY-2002	Speaker matching transformer	4.95
		ZY-4004	Speaker matching transformer	4.95
		ZY-2003	Speaker matching transformer	5.95
		P8S	Jensen speaker	6.81
		PI0T	Jensen speaker	6.45
		PI2T	Jensen speaker	7.08
		TT4	Bogen-Presto turntable with standard motor	99.50
		TT5	Bogen-Presto turntable, same as TT4 but hysteresis motor	129.50
			NOTE: Catalog refers to TT4 as T68AH, which is error. Correct T68AH is listed at bottom of column 3, Page 180.	
		T68AH	Turntable	170.00
181		HD-11	Tape eraser	23.38
		255	Chair	65.00
		A-7	Disc cabinet	25.50
		B-10	Disc cabinet	28.50
		C-12	Disc cabinet	37.50
		D-16	Disc cabinet	51.00
		SR-420	Film separator	8.00
		SR-6820	Film separator	8.75
		SR-1216	Film separator	9.50
		TR-742	Tape cabinet	15.75
		TR-1021	Tape cabinet	11.55
		F50-6120	Film cabinet	90.00
		RM-77	Film Reel-Mobile	89.25

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
181 (cont'd)		DM-360X	Disc Reel-Mobile	183.00
		C-540	Disc cabinet	240.00
		301	Stylus gauge	1.50
		602C	Equalizer	57.50
		TS4H	Tape Splicer	8.65
			Industrial tape splicer (all models)	55.00
		SH-20	Shielded two conductor wire	
			— less than 1000 ft. (per ft.)	.051/2
			— per 1000 ft. spool	50.00
		8440	Shielded wire	
			— 100 ft. package	4.60
			— 500 ft. package	19.95
			— 1000 ft. package	39.75
		1261	Shielded wire	
			— 250 ft. package	11.97
			— 500 ft. package	22.05
			— 1000 ft. package	44.10
		8428	Shielded wire	
			— 50 ft. package	5.40
			— 100 ft. package	10.50
		MIC-100	Microphone cable (per ft.)	.08
		8410	Microphone cable (per ft.)	.09
183			AMPEX SERIES 300 (ALL 7 1/2"—15")	
		7425-01	Single channel Model 300-U, uncased 1/4" tape, full track	2,150.00
		7425-03	Single channel Model 300-C console, 1/4" tape, full track	2,250.00
		30902-01	Two channel Model 300-2U, uncased, 1/4" tape, two tracks	3,490.00
		30902-03	Two channel Model 300-2C console, 1/4" tape, two tracks	3,815.00
		30903-01	Three channel Model 300-3U, uncased, 1/2" tape, three tracks	4,374.00
		30903-03	Three channel Model 300-3C console, 1/2" tape, three tracks	4,698.00
		30903-05	Three channel with Sel-Sync, uncased, Model 300-3SSU, 1/2" tape	4,800.00
		30903-07	Three channel with Sel-Sync, console, Model 300-3SSC, 1/2" tape	5,124.00
		30904-01	Four channel with Sel-Sync, uncased, Model 300-4SSU, 1/2" tape	5,576.00
		30904-03	Four channel with Sel-Sync, console, Model 300-4SSC, 1/2" tape	5,900.00
			NOTE: All above, 60 cycle models. No extra charge for 50 cycles when specified.	
			AMPEX 351-U SERIES (NAB CURVE)	
		30700-13	Uncased, 3 3/4—7 1/2" full track	1,475.00
		30700-1	Uncased, 7 1/2—15" full track	1,475.00
		30700-19	Uncased, 3 3/4—7 1/2" half track	1,475.00
		30700-07	Uncased, 7 1/2—15" half track	1,475.00
185				

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
185 (cont'd)			AMPEX 351-P SERIES (NAB CURVE)	
		30700-17	Two case portable, 3 $\frac{3}{4}$ —7 $\frac{1}{2}$ " full track	1,575.00
		30700-05	Two case portable, 7 $\frac{1}{2}$ —15" full track	1,575.00
		30700-23	Two case portable, 3 $\frac{3}{4}$ —7 $\frac{1}{2}$ " half track	1,575.00
		30700-11	Two case portable, 7 $\frac{1}{2}$ —15" half track	1,575.00
			AMPEX 351-C SERIES (NAB CURVE)	
		30700-15	Console model, 3 $\frac{3}{4}$ —7 $\frac{1}{2}$ " full track	1,625.00
		30700-03	Console model, 7 $\frac{1}{2}$ —15" full track	1,625.00
		30700-21	Console model, 3 $\frac{3}{4}$ —7 $\frac{1}{2}$ " half track	1,625.00
		30700-09	Console model, 7 $\frac{1}{2}$ —15" half track	1,625.00
186		652	Portable in case, 7 $\frac{1}{2}$ " half track	595.00
		654	Portable in case, 7 $\frac{1}{2}$ " full track	595.00
		656	Portable in case, 3 $\frac{3}{4}$ " half track	625.00
		658	Portable in case, 3 $\frac{3}{4}$ " full track	625.00
		662	Uncased model, 7 $\frac{1}{2}$ " half track	545.00
		664	Uncased model, 7 $\frac{1}{2}$ " full track	545.00
		666	Uncased model, 3 $\frac{3}{4}$ " half track	575.00
		668	Uncased model, 3 $\frac{3}{4}$ " full track	575.00
		620	Ampex amplifier-speaker	189.50
		938C	Telectro recorder	1,340.00
187		938R	Telectro recorder	1,150.00
		938P	Telectro recorder	1,300.00
		M-90ACC	Magnecord recorder in new metal console cabinet	1,495.00
		M-90AC	Magnecord recorder/amplifier with case	1,405.00
		M-90ACX	Magnecord recorder/amplifier, less case	1,295.00
		91X3319	Portable case for recorder	70.00
		81050	Portable case for amplifier	40.00
		M-90BAC	Binaural model in portable case (not listed in catalog)	2,255.00
		M-90BACX	Binaural model, less case (not listed in catalog)	2,105.00
		727AX	Magnecord recorder (not listed in catalog) (new type number P75-AX)	535.00
188		727BX	Magnecord recorder (not listed in catalog) (new type number P75-CX)	265.00
		PT63-A2HZ	Magnecord recorder in case	495.00
		PT63-A2HZX	Recorder, less case	450.00
		91X3318	Case	45.00
		PT63-J	Recorder-playback amplifier	390.00
		PT63-JX	Recorder, less case	345.00
		91X1890	Case	45.00
		PT6-6A	Magnecord recorder	405.00
		PT6-6AX	Magnecord recorder	375.00
		7A	Carrying case for recorder	30.00

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
188 (cont'd)		PT6-6J	Magnecord recorder	295.00
		PT6-6JX	Magnecord recorder	265.00
		7C	Amplifier case	30.00
		728-4X	Magnecord recorder (uncased)	759.00
		728-4	Magnecord recorder, with case	809.00
		S36-BX	Tape recorder rack mount	385.00
		S36-B	Rack mount in case	415.00
		111-1.5	Recording tape	.47
		111-3	Recording tape	.90
		111-6	Recording tape	1.50
		111-12	Recording tape	2.34
		111-24H	Recording tape	5.67
		111-24R	Recording tape	7.27
		111-48H	Recording tape	11.33
		111-48R	Recording tape	14.73
		120A-6	Recording tape	2.34
		120A-12	Recording tape	3.67
		190-9	Recording tape	2.34
		190-18	Recording tape	3.67
		190-36R	Recording tape	8.57
		190-36H	Recording tape	6.67
		190-72R	Recording tape	17.33
		190-72H	Recording tape	13.33
		150-9	Recording tape	2.40
		150-18	Recording tape	4.13
		150-36H	Recording tape	8.00
		150-36R	Recording tape	9.60
		150-72H	Recording tape	16.00
		150-72R	Recording tape	20.00
		200-24	Recording tape	6.33
		200-48R	Recording tape	14.67
		41-1/2S	Recording tape	.39
		43-1.5	Recording tape	.60
		200	Recording tape	6.00
		GR-LST	Recording tape	12.50
		RB-3	Recording tape	.17
		RB-4	Recording tape	.37
		RB-5	Recording tape	.44
		RB-7	Recording tape	.50
		RB-10 1/2 M	Recording tape	3.00
194	M5481	HF-50C	Broadcast transmitter, 50KW	(on application)
		TK367	Tube kit, 100% for HF-50C	(on application)
		TK368	Tube kit, FCC spares for HF-50C	(on application)
		JK-02C,H17	Spare crystal and holder for HF-50C	(on application)
196	M5966	HF-100C	Broadcast transmitter, 100KW	(on application)
		TK376	Tube kit, 100% for HF-100C	(on application)
		JK-02,H17	Spare crystal and holder for HF-100C	(on application)
199	M4748	HF-20B	Broadcast transmitter, 20KW	41,500.00
	M4748A	HF-20B	Broadcast transmitter, 20KW	41,500.00
	M4778	HF-20BX	Broadcast transmitter, 20KW	41,750.00
	M4778A	HF-20BX	Broadcast transmitter, 20KW	41,750.00
	M4780	HF-20TX	Telegraph transmitter, 20KW	22,900.00

all transmitters
include tubes

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
199 (cont'd)	M4780A	HF-20TX JK-03,H17 TK139 TK140	Telegraph transmitter, 20KW Crystal and holder Tube kit Tube kit <i>all transmitters include tubes</i>	22,900.00 34.60 2,067.00 1,078.00
202	M3787	HF-10B	Broadcast transmitter, 10KW, with oil-filled external transformers, for 60 cycles. Shipping wt.: 10,700 lbs. Cubage: 551.	24,059.00
	M3787A M3787C	HF-10B HF-10B	Same as above but for 50 cycles Broadcast transmitter, 10KW, with dry type external transformers, for 60 cycles. Shipping wt.: 7000 lbs. Cubage: 492.	24,059.00
	M3787D M3789	HF-10B HF-10BX	Same for above but for 50 cycles Broadcast transmitter, 10KW, same as M3787, with keying, for 60 cycles	22,500.00 22,500.00
	M3789A	HF-10BX	Broadcast transmitter, 10KW, same as M3789, with keying, for 50 cycles	24,459.00
	M3789B	HF-10BX	Broadcast transmitter, 10KW, same as M3787C, with keying, for 60 cycles and dry external transformers	24,459.00
	M3789C	HF-10BX	Broadcast transmitter, 10KW, same as M3789B but for 50 cycles	22,900.00
	M3791	HF-10C	Communications transmitter, 10KW	22,900.00
	M3791A	HF-10C	Communications transmitter, 10KW	21,500.00
	M3793	HF-10CX	Communications transmitter, 10KW	21,500.00
	M3793A	HF-10CX TK255 TK253 TK256	Communications transmitter, 10KW HFTSX-10 tube set* HFTSB-10 tube set HFK tube set	21,900.00 21,900.00 611.00 1,141.50 5.65
	* Also erroneously listed as an HF-10TX transmitter. See Page 203 for Model HF-10TX and accessories.			
203	M3795 M3795A	HF-10TX HF-10TX TK255	Telegraph transmitter, 10KW Telegraph transmitter, 10KW Tube kit	15,985.00 15,985.00 611.25
	M3794 M3794A	HF-5TX HF-5TX TK254	Telegraph transmitter, 5KW Telegraph transmitter, 5KW Tube kit	15,485.00 15,485.00 611.00
	PLEASE NOTE: Weights and cubages shown on Page 205 are in error. Correct data is given below. Also listed are new models not in catalog and using dry type external transformers in place of heavier oil-filled units.			

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
205	M3786	HF-5B	Broadcast transmitter, 5KW, with oil-filled external transformers, for 60 cycles. Shipping wt.: 9800 lbs. cu: 535	21,900.00
	M3786A M3786B	HF-5B HF-5B	Same as above but for 50 cycles Broadcast transmitter, 5KW, with dry type external transformers, for 60 cycles. Shipping wt.: 6500 lbs. Cubage: 485.	21,900.00
	M3786C M3788	HF-5B HF-5BX	Same as M3786B but for 50 cycles Broadcast transmitter, 5KW, same as M3786, with keying added, and for 60 cycles.	21,100.00 21,100.00
	M3788A M3788B	HF5-BX HF-5BX	Same as M3788 but for 50 cycles Broadcast transmitter, 5KW, same as M3788 but with dry type external transformers, keying, and for 60 cycles	22,300.00 22,300.00
	M3788C	HF-5BX	Same as M3788B but for 50 cycles	21,500.00
	M3790	HF-5C	Communications transmitter, 5KW	21,500.00
	M3790A	HF-5C	Communications transmitter, 5KW	19,250.00
	M3792	HF-5CX	Communications transmitter, 5KW	19,250.00
	M3792A	HF-5CX	Communications transmitter, 5KW	19,650.00
	M3794	HF-5TX	Telegraph transmitter, 5KW	19,650.00
	M3794A	HF-5TX	Telegraph transmitter, 5KW	15,485.00
	M3796	HFXT-1	Crystal and oven	15,485.00
		TK252	HFTSB-5 tube set	34.60
		TK254	HFTXB-5 tube set	1,070.25
		TK256	HFK tube set	611.00
				5.65
208	M4964	HF-1M	Broadcast transmitter, 1KW with tubes	5,875.00
		TK249	Tube kit	304.25
		H-7	Crystal and holder	14.95
		H-17	Crystal and holder	14.95
		JK-02	Crystal oven	12.50
	M5263		Limiter/filter amplifier	295.00
	M5239		Exciter only	515.00
210	M4575	CMG-1	Communications transmitter, 250 watts, with tubes	1,895.00
		H-7	Crystal and holder	14.95
		H-17	Crystal and holder	14.95
		JK-02	Crystal oven	12.50
		TK136	Tube kit	92.10
	M4576		Microphone assembly	39.50
			Filters (all models)	60.00
212	M5593	CMP-1	Communications transmitter, with tubes	4,350.00
	M5593A	CMP-1A	Communications transmitter, with tubes	4,350.00
		CMP-1B	Communications transmitter, with tubes	4,350.00
		CMP-1D	Communications transmitter, with tubes	4,695.00
		CON-2	Remote control panel	116.50
		CON-3	Remote control panel	(on application)
		TK138	Tube kit	149.37

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
213 (cont'd)	M3449Y	TK222	Two-channel transmitter with tubes	1,975.00
			Tube kit	60.25
			Coil sets (any range)	18.00
			H-7 Crystal and holder	14.95
			H-17 Crystal and holder	14.95
			JK-02 Crystal oven	12.50
			Microphone assembly	39.50
214	M3491-Y	TK237	Single channel transmitter with tubes	1,705.00
			Tube kit	45.05
			Coil sets (any range)	18.00
			H-7 Crystal and holder	14.95
			H-17 Crystal and holder	14.95
			JK-02 Crystal oven	12.50
			Microphone assembly	39.50
216	M4311-B	CMW-1	700-watt input communications transmitter	3,250.00
			Microphone assembly	47.50
			TK137 Tube kit	142.75
			H-7 Crystal and holder	14.95
			JK-02 Crystal oven	12.50
217	M5569	TK291	CW transmitter	693.00
			CW transmitter, less cabinet	670.50
			Tube kit	23.10
			H-17 Crystal and holder	14.95
			JK-02 Crystal oven	12.50
218	M5570	TK292	Modulator	467.00
			Modulator, less cabinet	444.50
			Tube kit	22.65
			Microphone assembly	39.50
			M4576 Transmitter	1,160.00
			M5588 Transmitter	1,115.00
			Microphone assembly	39.50
			H-17 Crystal and holder	14.95
			JK-02 Crystal oven	12.50
220	M5805	SSB-100	Transmitter/receiver	(on application)
			Crystal	(on application)
			TK353 Tube kit	(on application)
222.	M5708		Oscillator buffer amplifier unit	(on application)
			Oscillator buffer amplifier unit	(on application)
			M5704 CW amplifier, 1KW	(on application)
			M5705 CW amplifier, 1KW	(on application)
			M5706 CW amplifier, 1KW	(on application)
223	M5077	JK-07E	Transmitter	(on application)
			Crystal oven	(on application)
			H-18 Crystal for above oven	(on application)
			TK199 Tube kit	(on application)
			Transmitter	(on application)
			JK-07E Crystal oven, less crystal	(on application)
			H-18 Crystal for above oven	(on application)
			TK198 Tube kit	373.64

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
224	M3975 M4116 M4124	H-17	Homing beacon transmitter Antenna coupler Remote control/audio amplifier Microphone desk stand Crystal	7,900.00 425.00 525.00 32.50 14.95
225		MPS-1 MPS-73	UHF command transmitter Checkout generator VLF linear amplifier	(on application) (on application) (on application)
226	M5610		VHF transmitter, 50 watts	1,995.00
227	M3815 M5507		Totalizing recorder Totalizing recorder	1,375.00 905.00
		TK230 BFR-50C TK310	Tube kit FM relay transmitter Tube kit Single Multiplex sub-channel Dual Multiplex sub-channel	36.25 1,875.00 69.40 895.00 1,195.00
228	M5645		VHF dummy antenna Water cooled dummy antenna (all models)	22.50 (on application)
	M5263 M5263A		Communications amplifier Communications amplifier	295.00 295.00
		TK235	Tube kit Selective amplifier (single quantities) Selective amplifier (quantities 2 thru 9) Tube kit	8.15 300.00 260.00 9.86
229	M3922 M3922 M5138			
	M4230	117C903	Remote control system VFO/crystal oscillator	280.00 950.00
		JK-57M	Crystal and oven	60.00
		12TR500	Citizens Band transceiver	532.00
		12TR500	Citizens Band transceiver, with remote control	562.00
		12/117TR500	Citizens Band transceiver, for 12 volt DC or 117 volt AC	554.00
			Set of 3 crystals	38.00
		8355	Roof top antenna	9.80
		8417	Dynamic microphone	4.00
			50Kc IF filter (optional)	13.80
		A-4002	Whip antenna	(on application)
230		770	Oscilloscope	470.00
		685	Oscilloscope, portable	(on application)
		6000	Tube tester	197.50
		539B	Tube tester, industrial	439.00
		BL-1	Blank panels, per 1 3/4" multiples	1.50
		335B	FM monitor	1,695.00
	M5644		Desk rack cabinet	22.50
		XLR3-11	Cannon connector	1.03
		XLR3-12	Cannon connector	.99
		XLR3-13	Cannon connector	1.03
		XLR3-14	Cannon connector	.79
		XLR3-35-2G	Cannon connector	6.17
		XL3-35	Cannon connector	2.90
		P3-14	Cannon connector	2.19

CATALOG PAGE	FACTORY NUMBER	TYPE NUMBER	DESCRIPTION	UNIT PRICE
230 (cont'd)		P3-13	Cannon connector	3.68
		P3-35	Cannon connector	5.74
		P3-CG-11S	Cannon connector	4.16
		P3-CG-12S	Cannon connector	3.40
		P3-35-2G	Cannon connector	12.24
		260	Volt-Ohm-Meter	43.95
		0073	RF probe	7.50
		311	Vacuum tube Volt-Ohm-Meter	64.95
		TR-325	Industrial mobile phone	360.00
		TR-426	Industrial mobile phone	360.00
		TR-426A	Industrial mobile phone	360.00
231	M5666 M3737		Auditorium system	995.00
			Tubeless modulation monitor	95.00
		5907	Transistorized loudhailer	125.00
		GR-120	Battery kit	1.20
		6U-RSF	Inverter	49.90
		6S-HSJ	Inverter	83.34
		12U-RSF	Inverter	49.90
		12U-HSJ	Inverter	83.34
	M3934		Tube socket	45.00
		B-40216	Tube socket	150.00
		A-30687-1	Blower	130.00
		PJ-106	Audio terminal block	9.45
		114-321	Telegraph key	8.80
		GF-9	Touch-up paint	3.50
		GF-8	Touch-up paint	3.50
		GF-2	Touch-up paint	3.50
		GF-3	Touch-up paint	3.50
232		GPR-90RX	SSB crystal control receiver	640.00
		GSB-1	TMC SSN adaptor	149.50
		CM-O	FM relay receiver	75.00
		117R905	Conelrad receiver	140.00
		117R906	Conelrad receiver	140.00
		TRC-1	TV rebroadcast receiver	1,150.00
			Extra tuners	150.00

GENERAL SALES POLICY AND TERMS

PRICES

Gates maintains a standard price policy. All prices are F. O. B. Quincy, or F. O. B. point of origin for non-Gates manufactured items. Prices do not include any Federal, State or Local Tax. All published prices are subject to change without notice.

WARRANTY

Gates warranty provides excellent product protection. A copy of our comprehensive warranty will be furnished on request. Products, not manufactured by Gates, bear only the maker's warranty. Equipment installation, maintenance and operation are the responsibility of the purchaser. In no event shall Gates be liable for anticipated profits or for consequential damages.

MODIFICATION

Gates reserves the right to modify any product without notice in the interest of improved performance or design. Gates also reserves the right to withdraw any product from sale without notice.

SHIPMENT

Gates proudly offers fast shipment service. In absence of specific shipping instructions, the method of shipment and the carrier shall be selected by Gates. Gates shall not be liable for any delays in or inability to complete the manufacture and shipment of equipment. Delays shall not relieve the purchaser of his obligation of performance. Items damaged in transit should be called to the attention of the delivering carrier immediately and claims placed within five days. Purchaser must provide satisfactory insurance when special transportation utilized.

PAYMENT ARRANGEMENTS

Gates recommends establishment of a standard credit account. Where credit is not established, to expedite service, shipments will be made on a C.O.D. basis. Gates offers an excellent time payment plan for larger purchases. The customer must confirm by purchase order, letter or wire, all verbal orders. All terms of payment are subject to final acceptance by Gates Radio Company, Quincy, Illinois.

REPAIRS AND RETURNS

If necessary to return any item for repair or adjustment, customers should receive Gates standard return authorization form which is available from Gates Home Office—Quincy, Illinois. Gates can not accept liability for unauthorized returns.

ACCEPTANCE

All orders are subject to final written acceptance at Gates Home Office—Quincy, Illinois. The banking of, or other use of the down payment, shall not constitute acceptance of any order by seller.

OUR OBJECTIVE

Our objective is to provide the best possible equipment and the finest possible service to a wonderful industry that we have been privileged to serve for nearly 40 years.

GATES RADIO COMPANY

Subsidiary of Harris-Intertype Corporation

Quincy, Illinois, U. S. A.