

GATES

BC-1T

**1000/250 Watt
AM Broadcaster
Transmitter**



GATES

BC 1T

for 1000/250 watts

Accent On Performance Emphasis On Dependability



Noted for its unequalled reliability and modern styling, the Gates BC-1T is an excellent example of a transmitter designed with the **customer** in mind. Many exclusive features suggested by broadcasters have been incorporated into the BC-1T, giving it a mark of distinction among one kilowatt transmitters.

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

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

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

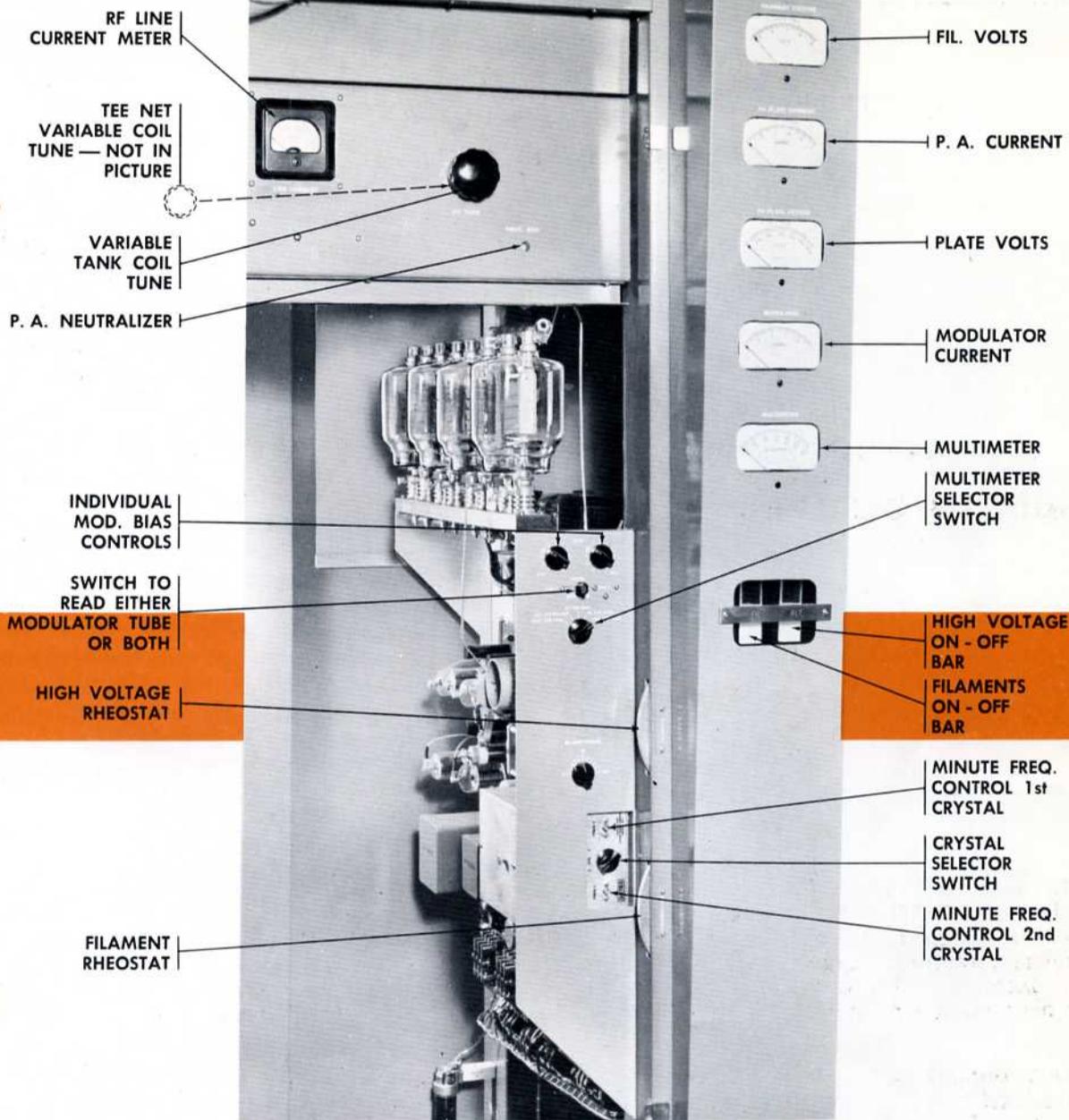
DESIGNED to accommodate Class IV stations with necessary power reduction to 250 watts nighttime. Flip one switch to change power and audio level for either local or remote control.

HIGH FIDELITY is often correctly thought of as wide frequency response. But in the BC-1T, lower distortion and lower noise are important features. BC-1T distortion is more frequent in the one percent range and noise in the lower sixties. The result is all the way high fidelity.

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

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

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



Creative Engineering At Its Very Best

CONSTRUCTION is in a heavy 16 gg. steel cabinet, rigidly reinforced and attractively styled. Meter panel slopes forward for ease in observation and gives the added touch for today's modern radio age. A full length front door is held closed by magnetic door catches. Behind the front door is a full length perforated grill, interlocked for personnel protection but affording full view of components from top to bottom, with the transmitter in operation. This perforated grill may be removed in seconds by means of snap locks. All operating controls are instantly accessible by opening the door. At the bot-

tom front is a full width filtered air intake grill. Exhausted air is brought out of the top by dual exhaust fans. Though the back of the transmitter is quickly removable, there is no need to do so as all servicing is accomplished from the front. With this exclusive design, the transmitter may be located near or against the wall with great savings in floor space and the convenience of more usable room in the transmitter building. The cabinet side is also removable. Though the need is unlikely, every part may be reached down to the smallest resistor in seconds.

General Information

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

INBUILT DUMMY ANTENNA: More than ever, with two-power operation of 1000 and 250 watts, the exclusive Gates feature of the inbuilt dummy antenna will be appreciated by the engineer. Not only does regular maintenance become a pleasure but initial alignment and periodic proof of performance, now required at two power levels, are accomplished with utmost simplicity. A light indicates when the dummy antenna is in use to eliminate possibility of accidentally leaving the dummy antenna in the circuit for regular broadcasting.

COMPLETE SERVICEABILITY FROM THE FRONT: All operation controls are instantly accessible by opening the front door. At the bottom front is a full width filtered air intake grill. Exhausted air is removed through the top by dual exhaust fans. Though the back of the transmitter is quickly removable, there is no need to do so as all servicing is accomplished from the front. With this exclusive design, the transmitter may be located near or against the wall with great savings in floor space and the convenience of more usable room in the transmitter building. The cabinet side is also removable. Though the need is unlikely, every part may be reached down to the smallest resistor, in seconds.

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

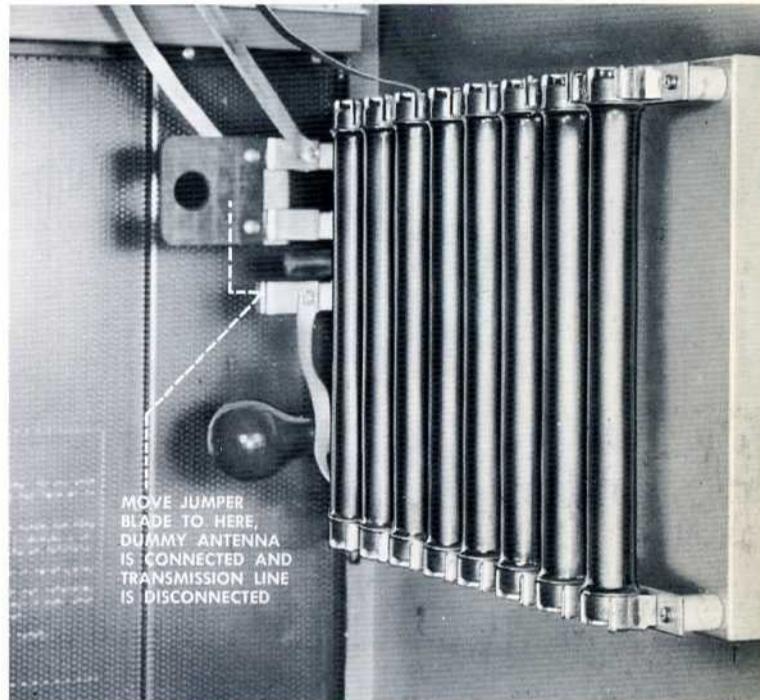


REMOTE CONTROL: As the BC-1T transmitter does not employ circuit breakers but in place, the reliable relay complement throughout, including filament and high voltage start-stop relays and overload and time delay relays, the adaption to remote control is greatly simplified. For power reduction, an inexpensive momentary contact type relay is available for changing power from the remote operating point. Provision is made in the transmitter for this relay in the case of remote control operation.

COOLING: Across the bottom front is a full width grill behind which is a replaceable air filter. In the top of the cabinet are two quiet operating suction fans. One of these is directly over the power tube section. The other removes all other air. By observing the inner BC-1T construction, the engineer will note all components, large and small, are in the exact circulating air stream. BC-1T cooling has been as much of the engineering consideration as the outstanding electrical design.

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

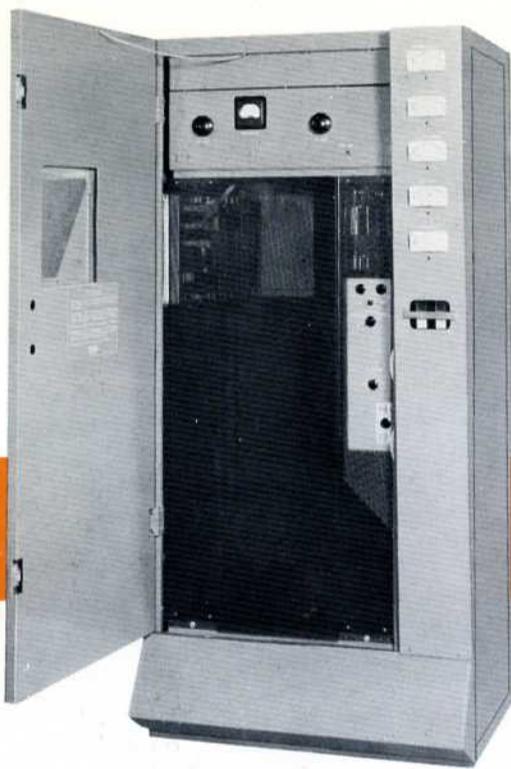
RF SECTION: Dual vacuum type crystal units require no temperature oven for pin-point stability. Frequency adjustment and crystal changeover are from the front. There are four RF stages, with all stages



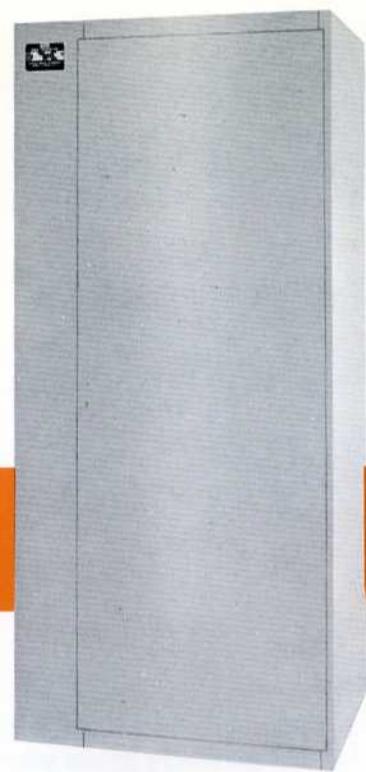
MOVE JUMPER
BLADE TO HERE,
DUMMY ANTENNA
IS CONNECTED AND
TRANSMISSION LINE
IS DISCONNECTED

self-neutralized except the last. Dual long-life 833A tubes feed 1000 watts into a complete Tee network for exact loading and harmonic attenuation. The final amplifier and Tee network are tuned by variable coils of the large edgewise type, manufactured by Gates. A portion of the audio is applied to the RF driver plate to provide linear RF drive under modulation for improved performance and ease of modulating. The oscillator-IPA unit and RF driver section incorporate printed wiring throughout.

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



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



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

POWER SUPPLIES in proper design and distribution can contribute greatly to listenability. Noise can be substantially below 60 db. One husky, low voltage supply with dual 866A rectifiers delivers well filtered direct current to all stages except the RF power amplifier and modulators. The power tubes are then operated exclusively from the high voltage supply with full wave 8008 rectifier tubes assuring excellent regulation and negligible carrier shift. A third bias supply for the Class B modulators with individual bias rheostats completes a most dependable power section.

MONITORS: This transmitter will operate with all current makes of frequency and modulation monitors. A scramble wound pickup coil inductively couples the modulation monitor. The frequency monitor connects to the 1st IPA in the crystal oscillator section. A modern transmitter accessory cabinet in-

cluding monitors and limiting amplifier also available.

POWER REDUCTION: With the Gates BC-1T 1000/250 watt transmitter, you efficiently reduce power to 250 watts nighttime operation by changing the primary voltage of the plate transformer. In this manner, when operating at reduced power of 250 watts, the primary power consumption is at a minimum, and the use of plate voltage dropping resistors, which are power consuming, is eliminated. The reduced plate voltage at 250 watts power to both the modulator and power amplifier tubes results in hundreds of added tube hours and a great savings in power cost.

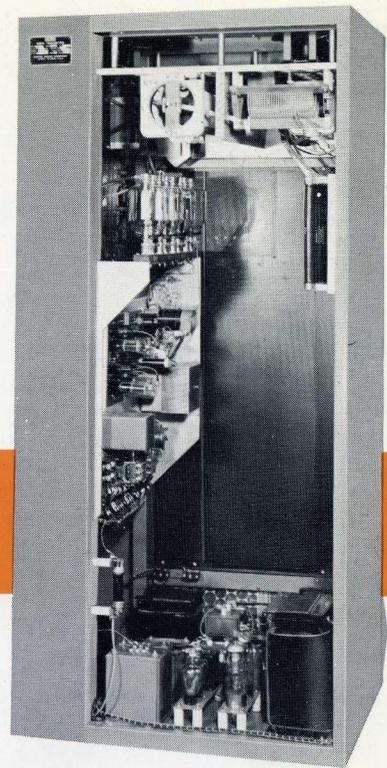
CONELRAD: The BC-1T is designed for instantaneous Conelrad switching by remote control or from front panel controls. The addition of the Conelrad feature is optional.



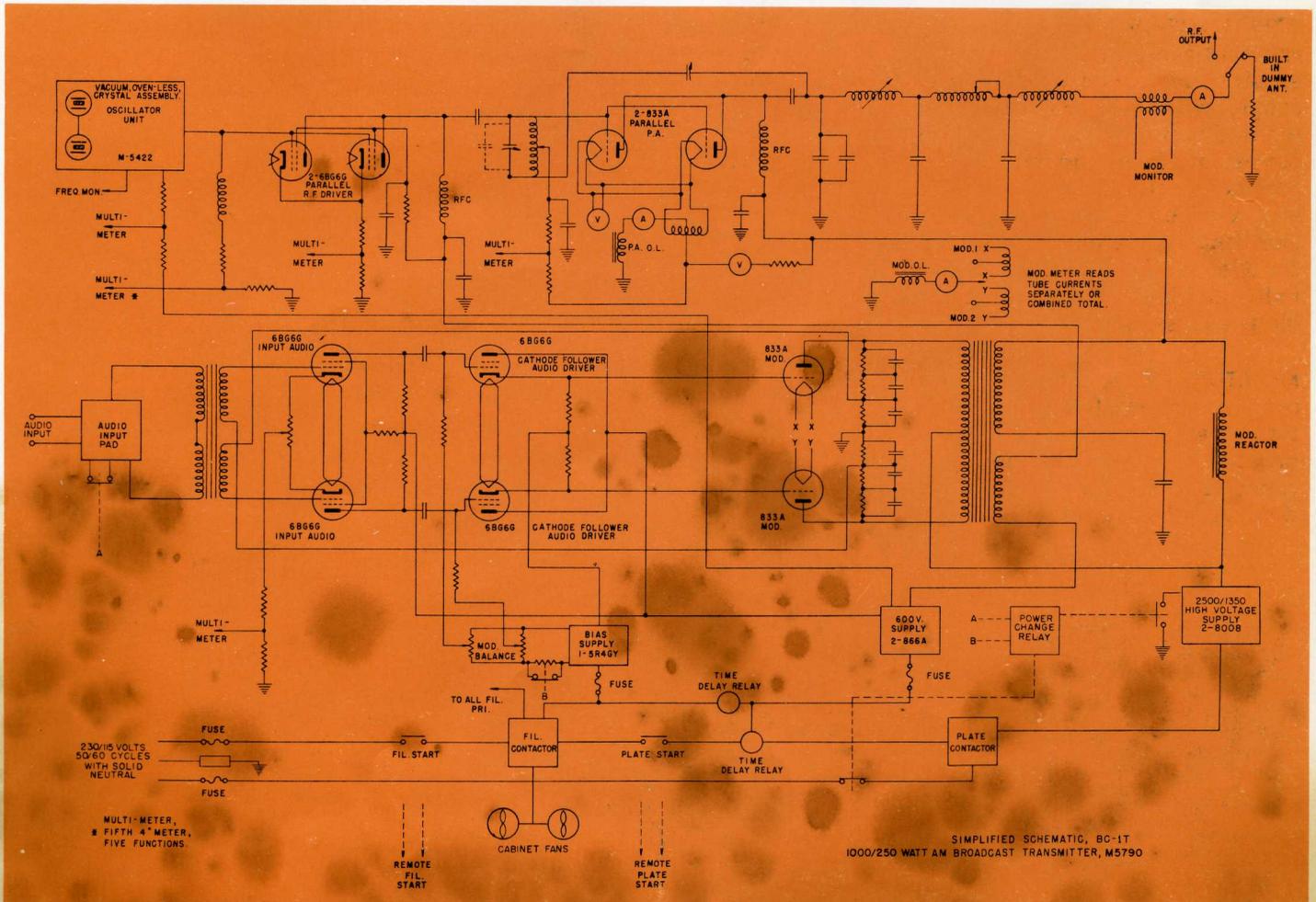
Open and closed views of the new ovenless, low drift crystal oscillator-first IPA unit.



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



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



Specifications

Ordering Data

POWER OUTPUT: Rated 1000/250 watts. Maximum capability, 1100/275 watts.

AUDIO INPUT: +16 db \pm 2 db for 100% modulation at impedance choice of 150, 250 or 600 ohms.

AUDIO RESPONSE: \pm 1 1/2 db. 30-12,000 cycles. (Typical: \pm 1 1/2 db 30-16,000 cycles under practical programming conditions.)

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

NOISE: (unweighed): At 1000 watts, 60 db or better below 100% modulation. At 250 watts, 55 db or better below 100% modulation.

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

RF OUTPUT IMPEDANCE: 50/70 ohms.

FREQUENCY STABILITY: \pm 10 cycles.
(Typical: \pm 2 cycles)

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

MODULATION: High level Class B.

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

POWER CONSUMPTION: At 1000 watts carrier power, primary power is
— at zero modulation, 2740 watts.
— at 100% modulation, 3940 watts.

At 250 watts carrier power, primary power is
— at zero modulation, 1740 watts.
— at 100% modulation, 2140 watts.

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

DUMMY ANTENNA: 51 1/2 ohms at 1000 watts 100% modulation.

TUBES: 12BY7A oscillator
12BY7A 1st IPA
(2) 6BG6G 2nd IPA
(2) 833A power amplifiers
(2) 6BG6G 1st audio
(2) 6BG6G 2nd audio
(2) 833A modulators
(1) 5R4GY rectifier
(2) 866A LV rectifiers
(2) 8008 HV rectifiers
Total number of tubes: 17
Total tube types: 6

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

WEIGHT: 950 lbs. net, 1140 lbs. packed. Cubage, 61.
Export, 1500 lbs., estimated packed. Cubage, 110.0.

ORDERING INFORMATION

BC-1T transmitter for 1000/250 watts complete with tubes, one crystal, dummy antenna and ready to operate Cat. No. M5790

NOTE: FCC type approval on this transmitter is Model BC-1T. Catalog Number M5790 is for ordering purposes only.

Extra crystal and vacuum holder	M5602
100% spare tube complement for BC-1T	TK-287
FCC required spare tube complement for BC-1T	TK-288
Conelrad for BC-1T — optional	M-5884 640 Kc M-5885 1240 Kc

GATES

GATES RADIO COMPANY

Subsidiary of Harris-Intertype Corporation

QUINCY, ILLINOIS

HARRIS
INTERTYPE
CORPORATION