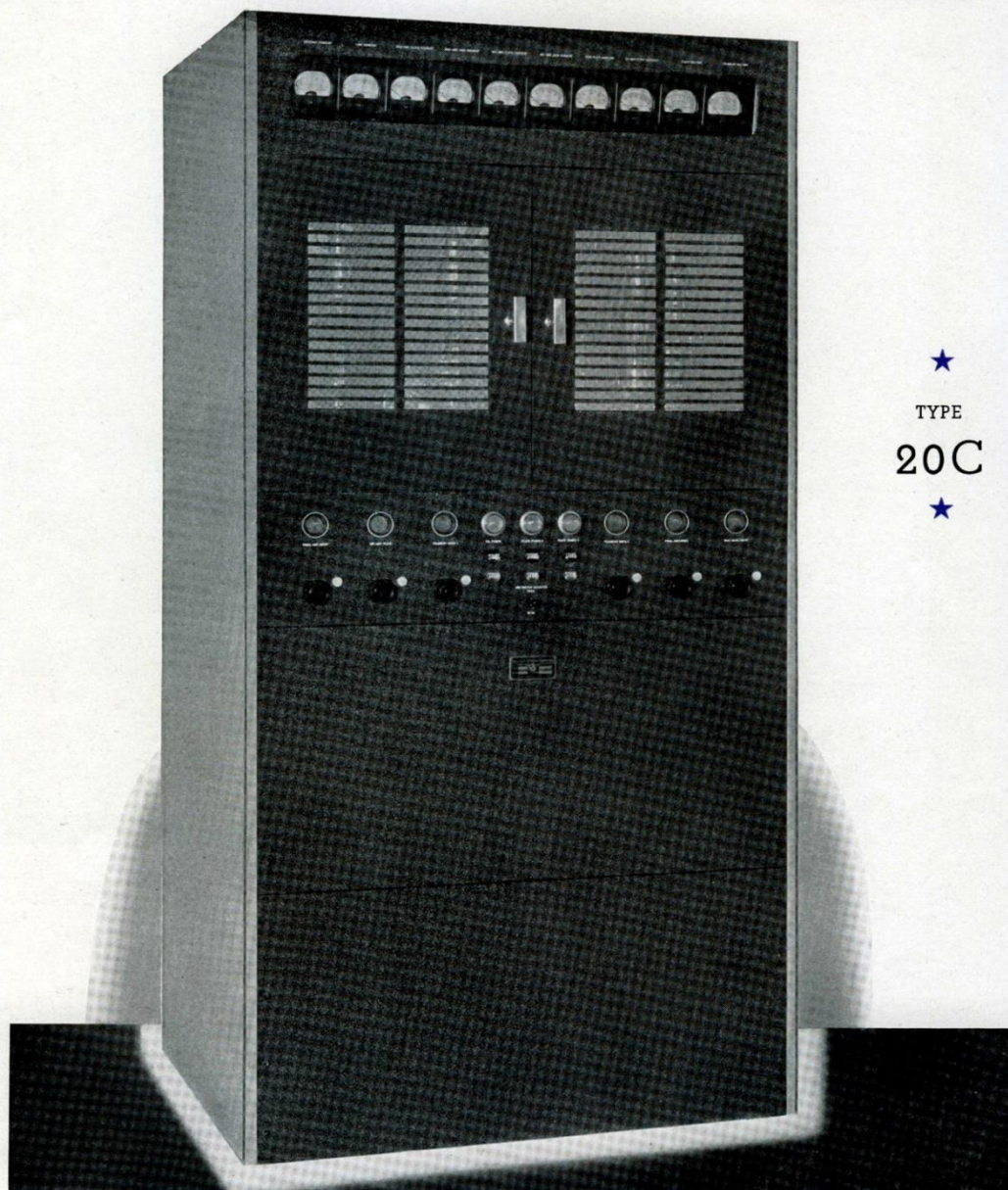


Modern Broadcast Transmitters

100 TO 1000 WATTS

COLLINS

1000 WATT BROADCAST TRANSMITTER



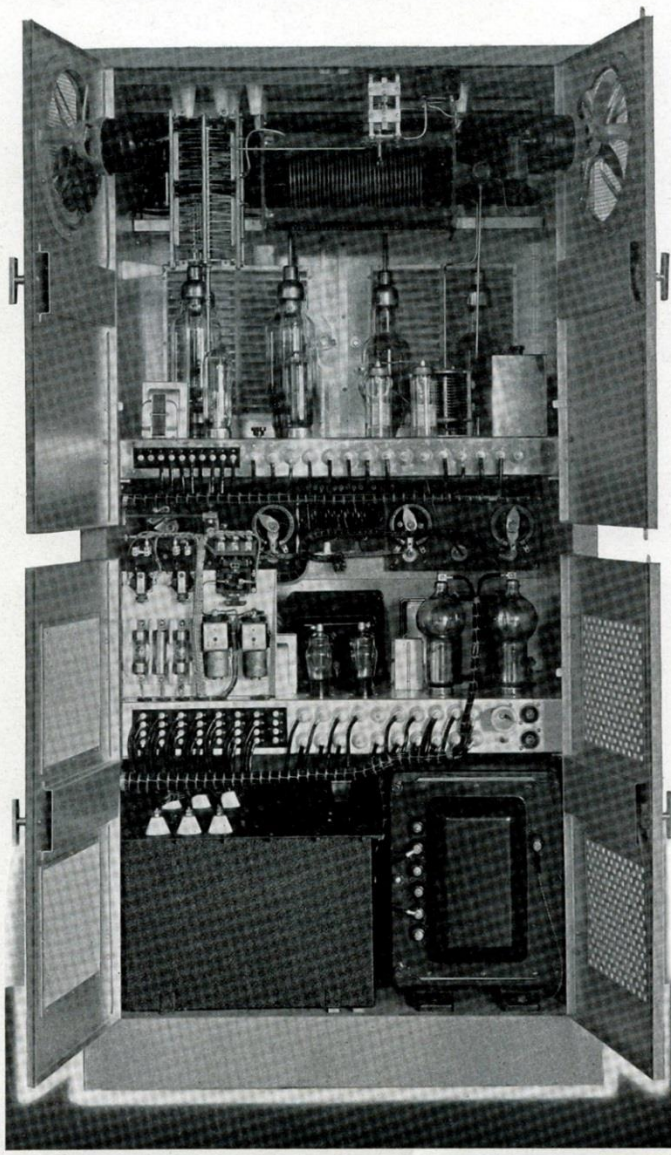
★
TYPE
20C
★

COLLINS 20 series and 300 series Transmitters have been installed in numerous broadcast stations during the past two years. Routine service in the field has proved these designs to be most dependable, economical and capable of highest fidelity



performance. The following specifications and illustrations describe the latest models embodying many noteworthy refinements. Advanced electrical design, mechanical excellence and modern appearance recommend this equipment to the alert broadcaster.

The 20C, 1,000 watt broadcast transmitter has many design features which make its value to the regional broadcast station readily apparent. The transmitter cabinet is unusually compact (36" wide, 28" deep, 72" high) for a transmitter of its power, yet all components are operated at very conservative ratings. The large iron core units, including the high voltage plate transformer, the high voltage filter reactors and the modulation transformer-reactor are mounted on the lower deck. The next deck carries the filament transformers, the intermediate voltage power supply, the bias rectifier, the high voltage rectifier tubes and the complement of control and protective relays. This deck can be removed as a single unit by sliding it to the rear on its supporting rails. The panel immediately above the second deck mounts the manual controls for the entire transmitter. These include power pushbuttons, key switches, filament voltage controls, bias voltage controls and remote tuning controls for the r-f circuits. The tuning controls have carefully machined gear trains and remote shafting, to accomplish smooth adjustment of the tuning. A locking arrangement is provided. The third deck carries all of the r-f and audio tubes and the r-f output circuits are arranged in the upper portion of the cabinet. The tubes are easily accessible through doors in both the front and rear of the cabinet. Proper operation of the transmitter is indicated by a complete set of instruments mounted behind a glass window in the top panel. These instruments are readily accessible for replacement or adjustment of the zero setting. Both the front and rear doors are fitted with



power interlocks as a safety measure, and the upper rear doors carry the blowers which assure proper ventilation.

The frequency response of the 20C is uniform within plus or minus 1.5 db from 40 to 10,000 c. p. s. and the r. m. s. harmonic content is less than 5% of the fundamental at full modulation. The carrier noise is more than 60 db (unweighted) below the program level.

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20C BROADCAST TRANSMITTER

The 20C Transmitter presents many advantages from the standpoint of ease of installation. Special power circuits are not required since the 20C operates from 110/220 volt 50/60 cycle single-phase power which is readily available. There are no external auxiliaries, and all wiring, including the transmission line, may be carried through standard conduit. The sides of the cabinet are removable and expose the internal cabling and provide a space for the incoming leads.

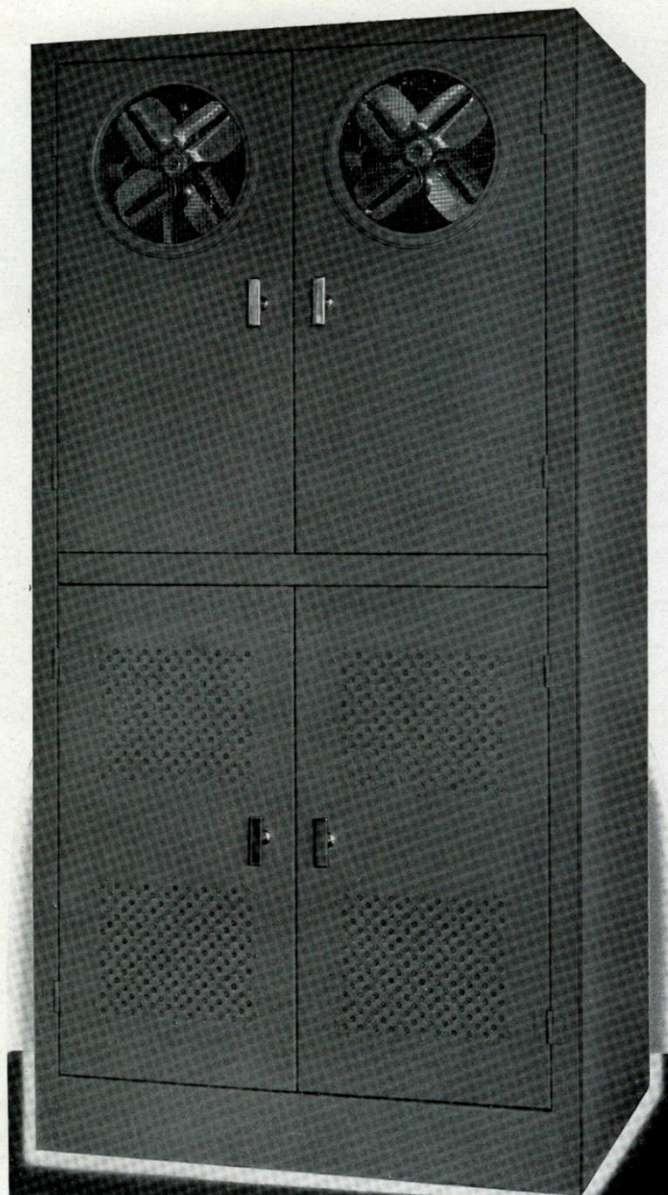
The tube complement is as follows:

- 2—RK20 Intermediate Amplifiers
- 4—C-204A Final Modulated Amplifiers
- 2—C-845 Audio Drivers
- 2—C-849 Class B Modulators
- 2—5Z3 Bias Rectifiers
- 2—C-866A Intermediate Voltage Rectifiers
- 2—C-375A High Voltage Rectifiers

★
TYPE
20E
★

The 20C Transmitter is arranged so that the power output may be adjusted to 1,000 watts, 500 watts or 250 watts and this model is approved for operation at any of these powers. Arrangements are made for instant change between any two of the above powers. This provision is utilized in stations where the power must be reduced at sunset. The tube complement can be modified for more economical full time 500 watt or 250 watt operation as follows:

- 1—RK20 Intermediate Amplifier
- 2—C-300 Final Modulated Amplifiers
- 2—C-845 Audio Drivers
- 2—C-300 Class B Modulators
- 2—5Z3 Bias Rectifiers
- 2—C-866 Intermediate Voltage Rectifiers
- 2—C-872A High Voltage Rectifiers



The modified transmitter is designated as the **type 20E** and this model is recommended for full time 500 watt stations and for 250 watt stations contemplating a power increase. The mechanical construction of the 20E Transmitter closely parallels that of the 20C Transmitter, so that it is possible to convert one model to the other with nominal expense.

100-100/250 WATT BROADCAST TRANSMITTERS

★
TYPES

300E—100 Watt

300F—100/250 Watt

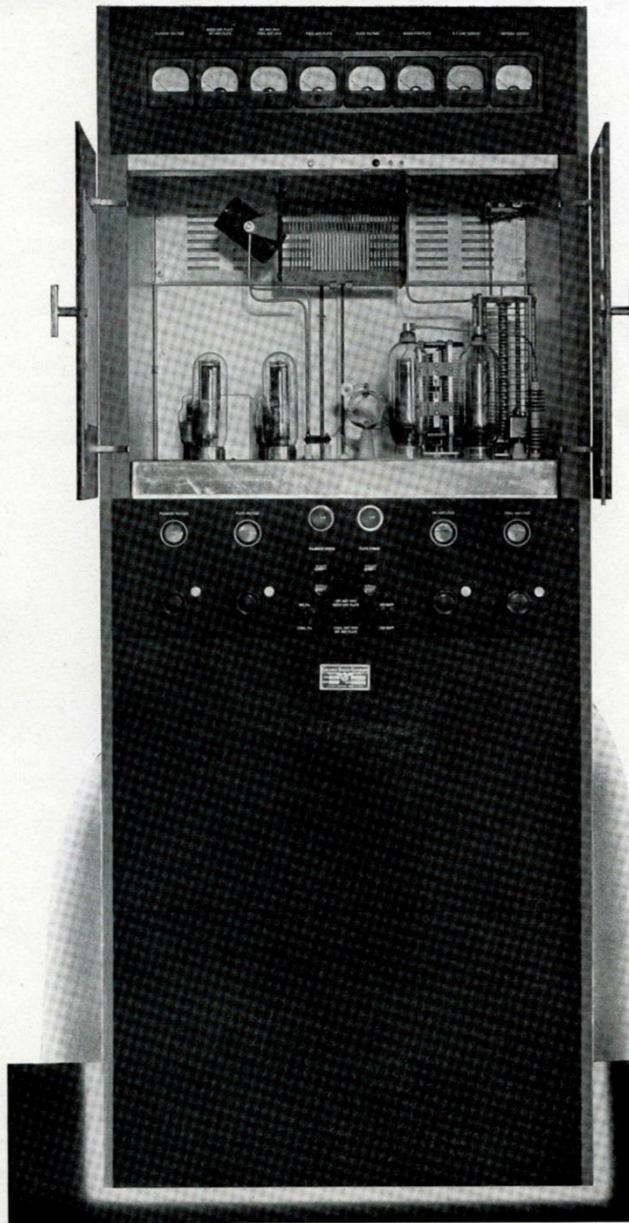
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THE COLLINS Type 300F Broadcast Transmitter is of an improved design especially built to meet the requirements of local broadcast stations. Its constructional arrangement follows closely that of higher powered Collins broadcast transmitters—such as, the type 20C—1,000 watt Transmitter and the Type 21C—5,000 watt Broadcast Transmitter. The accompanying illustrations show the neat arrangement of the components in a cabinet of distinctively modern design.

The larger iron core units, including the high voltage plate transformer, the high voltage reactors and the modulation transformer, are mounted in the lower deck. The next deck carries the filament transformers, the intermediate voltage power supply, the high voltage rectifier tubes, the control and protective relays and the fuses. The front panel in the center of the transmitter mounts the manual controls, including the power pushbuttons, the meter switches, the power change switch, the filament and plate voltage controls and the tuning controls for the r-f circuits. The tuning controls have accurately machined gear trains and remote shafting, arranged so that the tuning condensers are placed in the most advantageous position from an electrical standpoint—although all the controls are centrally located. Locking devices are provided on each panel control. The third deck carries all of the r-f and audio tubes which are accessible and plainly visible through the front doors. The instruments are of the square case 3" type mounted on an inclined instrument panel which is illuminated by a series of concealed lights and is protected by a plate glass window. The instruments are readily accessible for cleaning or adjustment. The front and rear doors are fitted with power interlocks which remove all dangerous voltages when any door is opened.

The tube complement of the 300F is as follows:

- 1—RK20 Intermediate Amplifier
- 2—C-201 Final Modulated Amplifiers
- 2—2A3 Audio Drivers
- 2—C-838 Class B Modulators
- 1—5Z3 Intermediate Voltage Rectifiers
- 2—C-872 High Voltage Rectifiers



The 300F Transmitter is used in connection with the type 40C Frequency Control Unit which, although mounted externally, is supplied as a part of the transmitter.

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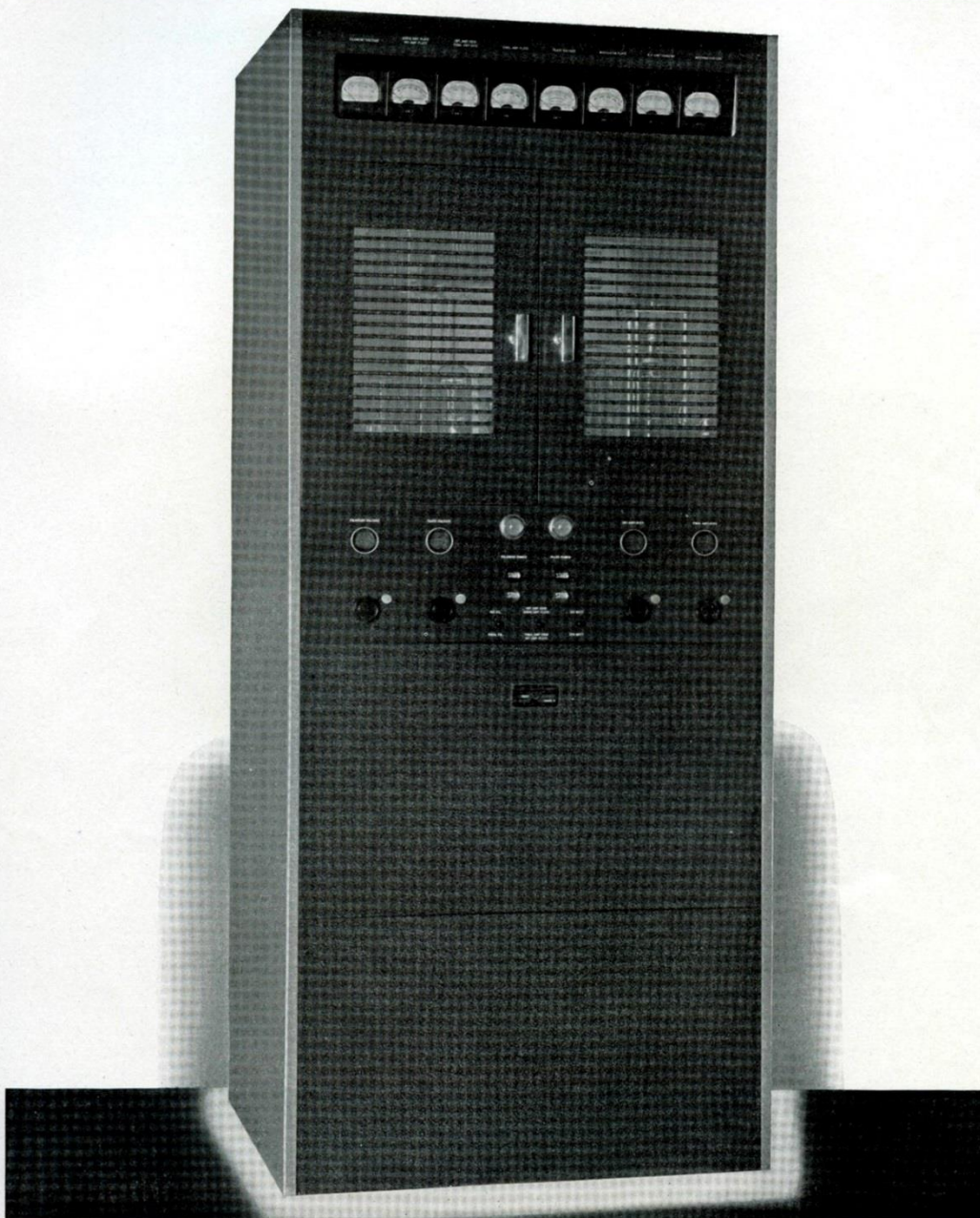
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The dimensions of the 300F cabinet are—72" high, 30" wide and 24" deep. The sides of the cabinet are removable and expose the internal cabling and provide space for the incoming leads. Installation of the transmitter consists merely of connecting the power leads, the audio input leads, the transmission line to the 40C

Exciter, the transmission line to the antenna and the leads to the modulation monitor. No complicated adjustments are necessary and it is possible to unpack the transmitter and place it on the air within a few hours.

The performance of the 300F Transmitter conforms to and exceeds the technical requirements of the Federal



Communications Commission. The frequency response is uniform within plus or minus 1 db. from 30 to 10,000 c. p. s. and the total r. m. s. harmonic content is less than 5% of the fundamental at any percentage of modulation. Carrier noise is more than 55 db. (approximately 70 db. weighted value) below 85% modulation. The out-

put circuit has the configuration of a low pass filter, so that radio-frequency harmonics are greatly attenuated. The arrangement provides for use of a concentric transmission line which is most convenient for use with modern antenna systems. An instrument is provided on the meter panel for remote indication of antenna current.

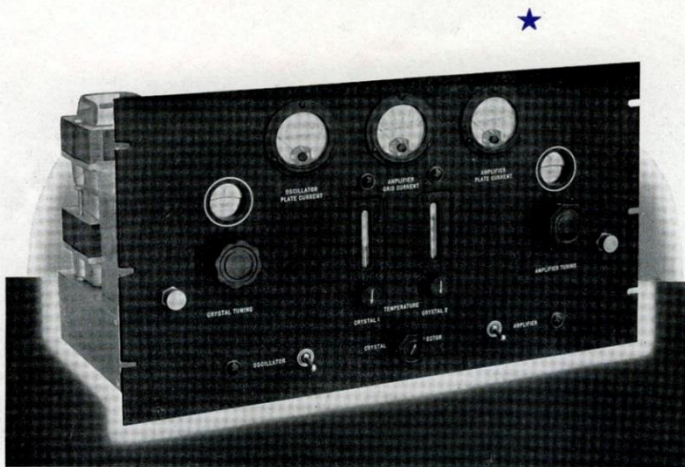
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7

300E TRANSMITTER ★ 40C FREQUENCY CONTROL UNIT

The type 300E Transmitter is supplied in place of the 300F to stations who are licensed for 100 watt operation only. The 300E Transmitter is identical to the 300F in mechanical construction. The modifications consist of the substitution of two 203A tubes for the two C201's in the 300F and the substitution of different transformers and reactors in the power supply and modulation circuits. The resistors and relays associated with the

power-change circuit are omitted in the case of the 300E. The mechanical and performance specifications given for the 300F apply also to the 300E. A station licensed for 100 watts may install the 300E Transmitter and when a power increase to 250 watts is granted, the equipment can be converted in the field to the type 300F Transmitter at a moderate cost and without loss of time on the air.



★
TYPE
40C
FREQUENCY
CONTROL UNIT
★

The 40C Frequency Control Unit is a standardized unit of new design which is used with all Collins Broadcast Transmitters—including, the 300E—100 watt, 300F—100/250 watt, 20C—1,000 watt and the 21C—5,000 watt Transmitters. The 40C Unit is constructed on a standard 19" x 10½" panel and is intended to be mounted in a Collins type 19G rack cabinet, together with the frequency monitor and the modulation monitor required by the Federal Communications Commission. Two type 296 precision temperature controlled crystal holders with thermometers and "A" cut quartz plates are provided with independent automatic heat control circuits and either crystal may be selected instantly by means of a panel switch.

The tubes used in the 40C Unit are as follows:

- 1—C100A Oscillator
- 1—45 Class A Buffer
- 2—RK23 Second Buffer
- 1—5Z3 Rectifier

Appropriate instruments are located on the panel and output terminals are provided for connection to the frequency monitor and to the transmitter. The cabinet containing the 40C Unit and the modulation and frequency monitors can be located at any convenient place in the transmitter building, and the r-f connections between this cabinet and the transmitter can be run any distance by means of duplex lead covered wires, or other suitable low impedance shielded wiring.

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Collins Radio Company

CEDAR RAPIDS

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