

The 202-A TRANSMITTER

PRECISE design methods applied to class B and class C amplifiers have made it possible to build a relatively high powered radiophone transmitter using tubes of only moderate plate dissipation. The new criteria indicate the value of high filament emission and of insulation for high plate voltages, and the improved efficiency eliminates the need for large heat dissipating capability. Several types of tubes meeting these requirements are now available, and the Collins Radio Company has developed the 202A Transmitter to exploit their possibilities.

The power rating of the 202A transmitter may be stated most generally by saying that it is designed to operate with a final amplifier plate input of one kilowatt with complete high level modulation. This one kilowatt input rating is determined by the ratings of the power supply and modulation system. The minimum plate circuit efficiency is 65 per cent at 15 mc. and the efficiency rises to approximately 80 per cent on the lower frequencies so that the r-f output varies between 650 and 800 watts. U. S. amateur regulations specify a maximum plate input of one kilowatt without regard to plate efficiency so that the 202A is adapted to full power amateur operation. Arrangement is also made to reduce the plate input to 666 or 833 watts when the transmitter is used for commercial service under a 400 or 500 watt license based on the indirect method of output rating. An understanding of the 202A's design can best be obtained by immediate reference to its constructional details.

Filament transformers and sockets in the 202A are interchangeable so that two or three groups of r-f tubes may be used. One arrangement consists of a C100 oscillator, an RK25 first amplifier, an RK20 second amplifier and two C200 class C final amplifiers. In this case the audio drivers are four 2A3's and the class B modulators are two C200's. An alternative combination substitutes 150T's in the class C and class B stages. The 150T's are similar in characteristics to the C200's except that the filament voltage is 5 instead of 10, and the anode

material is tantalum instead of graphite.

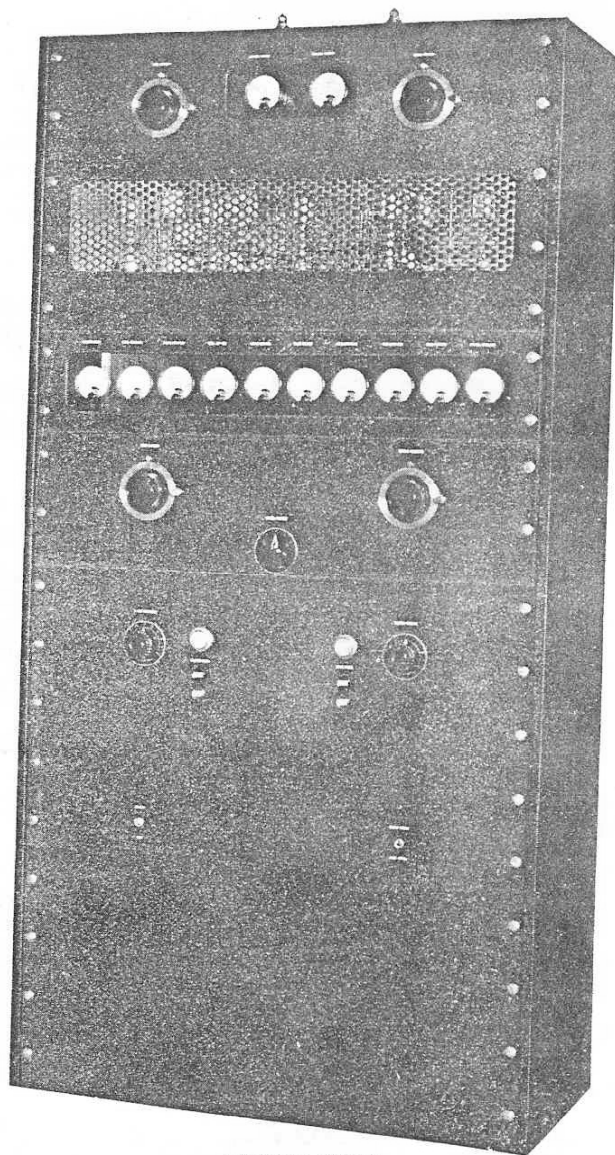
The high voltage power supply has two 872 mercury vapor rectifiers connected with transformer and filter components to deliver 1.0 ampere at 2500 volts. The three low voltage rectifier-filter systems each use a 5Z3 high vacuum rectifier to furnish plate voltage to the oscillator, first amplifier and the audio drivers and to furnish bias voltage to the class B and class C stages.

The apparatus is arranged in the most compact manner consistent with good electrical placement. The plate and modulation transformers are located on the bottom deck with the 872 rectifiers and the filament transformers. The second section carries the high voltage filter reactors, capacitors and the relay control equipment. The third deck mounts the oscillator, first amplifier stage of the r-f channel and the audio drivers with the associated power supplies. Suitable shielding prevents interaction between r-f, a-f and power circuits. The fourth or upper deck accommodates the class B modulators, the second r-f amplifier and the final r-f amplifier. The deck type of construction was adopted in the interests of neatness and accessibility. Each deck except the lower one may be pulled out on its side rails for inspection by loosening the ceramic insulated terminals on its rear edge. The cabling between decks is carried in the sides of the cabinet where it is made accessible by removing the side covers.

Maintenance of the very high plate efficiency of which the 202A is capable

requires each stage to be operated at exact conditions of supply voltage and current. A complete check on these relations is possible by means of the ten instruments mounted on a glass-protected instrument panel which is located at a convenient height for observation from the operator's desk, as well as from a standing position, when one is tuning the transmitter. The line current instruments are on a separate, protected panel near the top of the cabinet.

Devices to afford safeguards for the operator, and to protect the apparatus, have been given very careful study in connection with the 202A. The four rear doors are fitted with interlocks which



FRONT VIEW