

The Collins Type 20B

The 20B Transmitter is a continuation into the higher powered field of the series of standard Collins Transmitters. It is capable of a fully modulated carrier output of 750 watts which is perhaps the highest power that can economically be obtained when using air-cooled tubes. The 20B is designed primarily as a broadcast transmitter although it has found application for amateur use where it was desired to obtain the maximum possible modulated output with the limitation of one kilowatt input which is placed upon amateur transmitters. It is a broadcast transmitter which may be used by an amateur to fulfill his dream of an outfit with which he can sit down and talk, by means of either code or voice, with almost any station in any part of the world which it is possible to hear. Although the cost of a transmitter of this size is higher than many amateurs will care to pay in view of the excellent results that can be obtained with lower powered transmitters, a technical description is set out at length with the thought that it will be of general interest.

CLASS B MODULATION

It will, perhaps, not be a surprise to people familiar with the general features of Collins design to learn that this transmitter employs class B modulation. The Collins Radio Company has virtually pioneered the application of class B modulation to low and medium powered transmitters. In view of the excellent results obtained with this method of modulation at lower power, it was decided to carry on extensive tests with larger tubes to determine the suitability of class B modulation at high level for use with transmitters having plate inputs of one kilowatt or higher. Experimental load curves were run on '04A's and '49's. These curves indicated that these tubes were well suited to class B circuits and showed that an audio power of 500 watts could be obtained with the '04A's and a power of slightly over 600 watts could be obtained with '49's using a plate potential of about 2500 volts. Filament emission rather than plate dissipation is the limiting factor in obtaining maximum output from existing radio tubes including these two types.

Although the 20B is constructed in a manner adapted to high power components, its appearance harmonizes well with rack-mounted excitation and speech units.

The load curves indicated that a relatively small amount of power would be required for driving the grids of the modulators and measurements showed that UX 250's could be used for this purpose. However, in order to obtain the least possible distortion and to avoid working close to the limitations of any part of the circuit, it was decided to employ 845's as class A drivers with a class B input transformer having a high step-down ratio. The 845 driver stage is located in the transmitter proper and obtains its power supply from the transmitter power circuits. The audio frequency input to the transmitter is approximately at plus 8db.

The class B modulation transformer is a standard Collins 795 oil insulated type.

