



Frequency and Power-Output Chart for RCA Transmitting Tubes

This Note presents a chart designed to simplify selection of an RCA transmitting-tube type for use in any type of service at a given frequency and power output. The chart, which is printed on the inside pages of this Note, covers power-output requirements up to 500 kilowatts, and operating frequencies up to 2000 megacycles per second. It is divided into power-frequency areas, each of which is labelled with the type designation of the RCA transmitting tube which can be expected to deliver optimum performance over that area. In some cases, two or more tube types are shown in an area. The tube type shown in large letters is the most popular or economical type for operation in that area; the types shown in small letters have essentially the same power-output and frequency characteristics as the one shown in large letters, but may differ in other respects. If the area is subdivided by dashed lines, the tube type shown in large letters outside the dashed lines is recommended for use over the entire area.

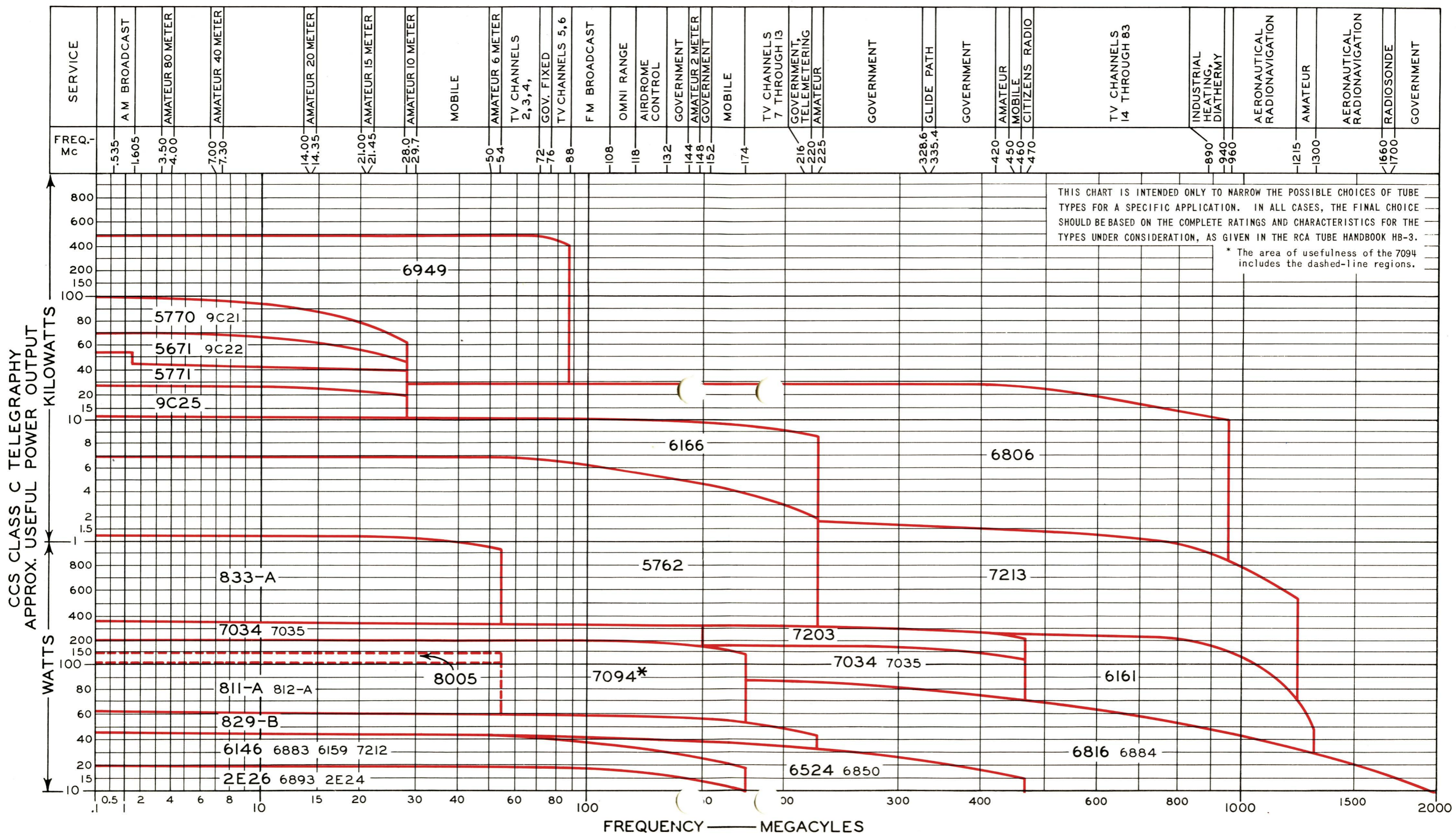
Conversion Table

The power-output values shown in the chart are for CCS class C Telegraphy service. To permit quick conversion of power-output requirements for other types of service to class C Telegraphy values, a conversion table is given in Table I. This table gives the approximate factor by which the required power output for each such type of service should be multiplied to obtain a corresponding class C Telegraphy output which can be read on the chart.

As an example of the use of the conversion table, assume that a grid-modulated class C amplifier capable of delivering an unmodulated-carrier output of 500 watts at a frequency of 2 megacycles is required. The multiplier for grid-modulated class C service is 5. Therefore, a tube capable of delivering 500×5 or 2500 watts in class C Telegraphy service at 2 megacycles is required. The indicated tube type in this case, as shown in the Selection Chart, is the 5762.

As another example, assume that the output stage of a television transmitter operating on vhf channel 2, 3, or 4 is required to deliver a

RCA Power Tube Selection Chart





power output of 10 kilowatts on synchronizing-signal peaks. The multiplier for class B Linear-amplifier or class C Television service is 1.45. Therefore, a tube capable of delivering 10×1.45 or 14.5 kilowatts at 54 to 72 megacycles in class C Telegraphy service is required. The indicated tube type in this case is the 6806.

When the desired operating point is near a power or frequency limit of an area, consideration should be given to parallel or push-pull operation of tubes in lower adjacent areas or to single tubes in higher adjacent areas. Thus, in the second example given above, it might be more economical or otherwise advantageous to use three parallel-connected air-cooled type 5762 triodes, or push-pull air-cooled type 6166 tetrodes in place of the water-cooled type 6806 indicated in the chart.

TABLE I

Type of Service	To Determine CCS Class C Telegraphy Power-Output Requirements	
	Multiply Required	By
Plate-Modulated RF Power Amplifier--Class C Telephony	Carrier Power	1.5
AF Amplifier or Modulator--Class AB ₂ or Class B	Maximum-Signal Power Output for Two Tubes in Push-Pull	0.7
Linear RF Power Amplifier--Class AB ₁ --Single-Sideband, Suppressed-Carrier Service	Peak Envelope Power	1.45
Grid- or Screen-Grid-Modulated RF Power Amplifier--Class C Telephony	Carrier Power	5
RF Power Amplifier--Class B Telephony	Carrier Power	5
RF Power Amplifier--Class B Television Service (Bandwidth = 6 Mc)	Synchronizing-Level Power Output	1.45
Grid- or Bias-Modulated RF Power Amplifier--Class C Television Service (Bandwidth = 6 Mc)	Synchronizing-Level Power Output	1.45

Additional Considerations

It is important to emphasize that the power output obtainable from a tube at a given frequency depends upon the conditions under which the tube is operated, and upon the circuit efficiency. The power-output values shown on the chart can be achieved by operation of the indicated tube types within their maximum ratings, in circuits having reasonably high efficiency, but are not guaranteed values. A tube type indicated for use in a particular power-frequency area can be expected to perform as well or better in any area below or to the left of the one in which it is listed.