



RCA MANUFACTURING COMPANY, INC.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

Harrison, New Jersey

RCA RADIOTRON
D I V I S I O N

APPLICATION NOTE No. 82

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APPLICATION NOTE
ON
WIDE-ANGLE TUNING WITH THE 6E5, 6G5, OR 6U5

It is possible to increase the shadow-angle sensitivity of the 6E5, 6G5, or 6U5 as a tuning indicator by increasing the maximum shadow angle from the usual value of 90 degrees to approximately 180 degrees. This improvement is obtained by using a separate triode in a new circuit to control the action of the ray-control electrode in the tuning-indicator tube. The cost of using this new circuit is but little more than the cost of the additional tube.

The circuit for obtaining wide-angle tuning is shown in the accompanying diagram. When a high negative bias is applied to T_1 , the plate current of T_1 is nearly zero and the voltage drop across R is nearly zero. Under this condition, the shadow angle is zero. When the grid of T_1 is at zero potential, the plate current of T_1 is high and the potential of point (a) is nearly -125 volts with respect to the cathode of the 6E5, 6G5, or 6U5. The shadow angle under these conditions is approximately 180 degrees. In the usual circuit, the maximum shadow angle is only 90 degrees because the potential of the ray-control electrode (a) does not become negative with respect to cathode.

The accompanying curve shows the relation between shadow angle and control voltage when T_1 is a type 76. Other tube types may be used in place of the 76; the shadow-angle characteristic with the 76 is shown merely to illustrate the performance of the circuit. For example, when T_1 is a 6J5, the cut-off voltage is approximately -12 volts; when T_1 is a 6K7, the cut-off voltage is approximately -40 volts, provided the suppressor is connected to control grid and screen voltage is obtained from the 250-volt source through a 5-megohm resistor.

A well-defined shadow angle is not obtained over the entire range of 180 degrees. The edges of the pattern are sharp for shadow angles from 0 to approximately 150 degrees; from 150 degrees to 180 degrees, the edges of the pattern are not sharp. However, by reducing the potential of point (b) with respect to ground, the maximum shadow angle is reduced and the edges of the pattern are sharp over the entire range. A suitable compromise can be made easily. In order to stabilize the potential of point (b), it is suggested that the bleeder current through R_1 be approximately 15 milliamperes.

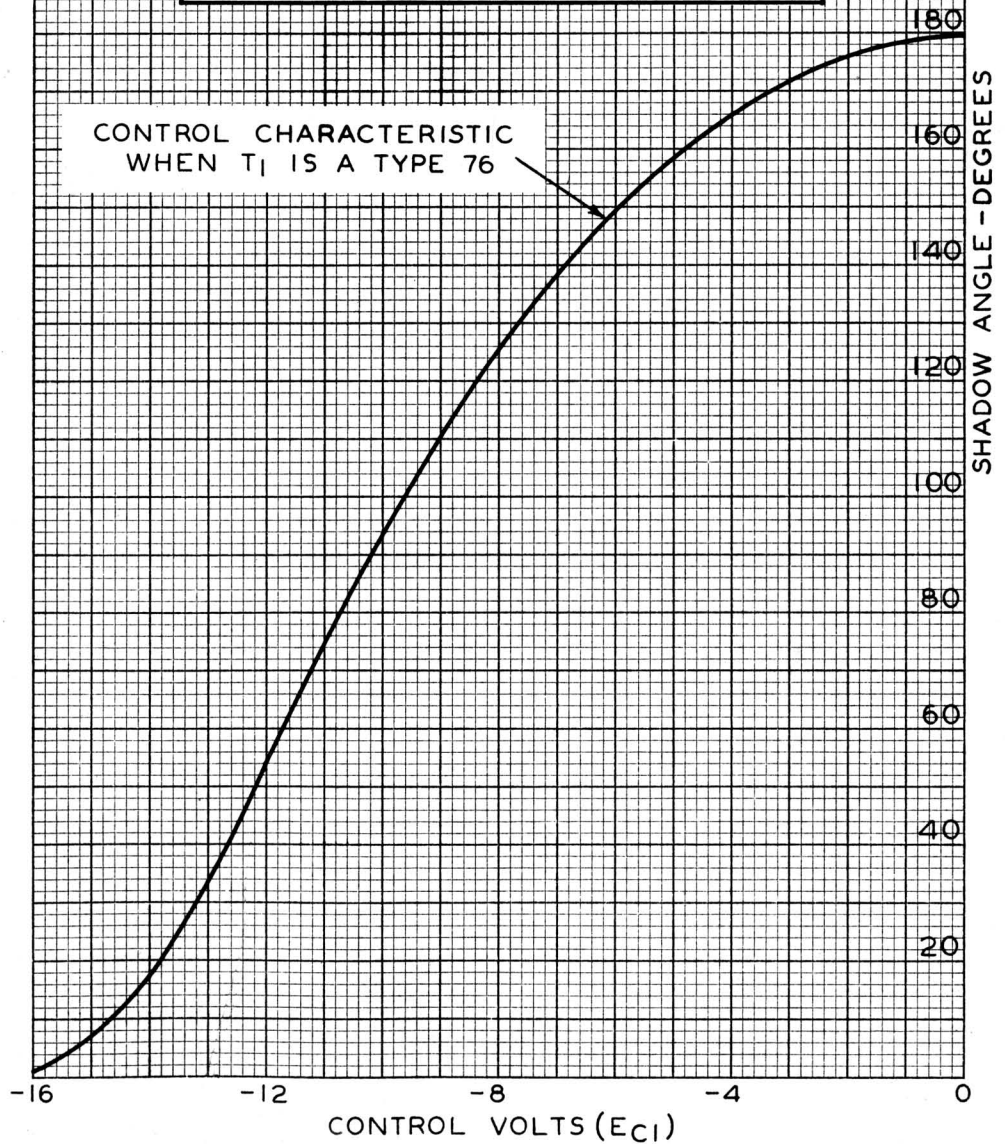
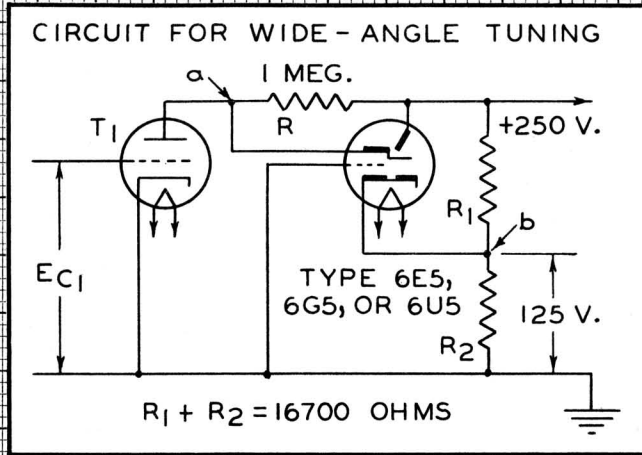
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OPERATION OF THE 6E5, 6G5, OR 6U5



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