

# Cunningham RADIO TUBES

CX-322



## SCREEN GRID RADIO-FREQUENCY AMPLIFIER

The '22 is a screen grid tube designed particularly for radio-frequency amplification in dry-battery-operated receivers employing 3.3 volt filament tubes.

### CHARACTERISTICS

|                                  |       |   |
|----------------------------------|-------|---|
| FILAMENT VOLTAGE (D. C.)         | 3.3   | Volts                                     |
| FILAMENT CURRENT                 | 0.132 | Ampere                                    |
| PLATE VOLTAGE                    | 135   | 135 <i>max.</i> Volts                     |
| GRID VOLTAGE                     | -1.5  | Volts                                     |
| SCREEN VOLTAGE                   | 45*   | 67.5** Volts                              |
| PLATE CURRENT                    | 1.5   | 3.3 Milliamperes                          |
| SCREEN CURRENT                   |       | Not over $\frac{1}{3}$ of plate current   |
| PLATE RESISTANCE                 | 50000 | 600000 Ohms                               |
| AMPLIFICATION FACTOR             | 300   | 290                                       |
| MUTUAL CONDUCTANCE               | 350   | 480 Micromhos                             |
| EFFECTIVE GRID-PLATE CAPACITANCE |       | 0.025 <i>maximum</i> $\mu\text{f.}$       |
| INPUT CAPACITANCE                |       | 3.2 $\mu\text{f.}$                        |
| OUTPUT CAPACITANCE               |       | 12 $\mu\text{f.}$                         |
| OVERALL LENGTH                   |       | 4 $\frac{25}{32}$ " to 5 $\frac{1}{32}$ " |
| MAXIMUM DIAMETER                 |       | 1 $\frac{3}{16}$ "                        |
| BULB (See page 42, Fig. 11)      |       | S-14                                      |
| CAP                              |       | Small Metal                               |
| BASE                             |       | Medium 4-Pin                              |

\* Maximum value of grid resistor is 5.0 megohms.

\*\* Maximum value of grid resistor is 1.0 megohm.

### INSTALLATION

The base pins of the '22 fit the standard four-contact socket. The socket should be installed to hold the tube in a vertical position. Cushioning of the socket may be desirable to avoid microphonic disturbances. For socket connections, see page 39, Figure 4.

For filament operation, refer to INSTALLATION for type '20.

### APPLICATION

As a **radio-frequency amplifier** in multi-stage circuits, it is necessary to shield carefully each stage and to include within the stage shield all of the component parts of that stage. Unless this is done, the amplification possibilities of the '22 cannot be realized.

As an **audio-frequency amplifier**, this tube may be operated with either the screen-grid or space-charge-grid connection. In either case, the value of plate coupling resistor should be of from 100000 to 250000 ohms. With the screen-grid arrangement, a plate supply voltage of 135 to 180 volts applied through the coupling resistor is recommended. Under these conditions, a screen voltage of 22.5 volts and a negative grid voltage of 0.75 to 1.5 volts are suitable. For the space-charge-grid connection, the inner grid is operated at 22.5 volts, while the outer grid becomes the control grid and is biased negatively by from 0 to 1.5 volts, depending upon conditions of operation.