



## Reference Guide for TELEVISION PICTURE TUBES

This CBS Reference Guide for Television Picture Tubes lists, to the best of our knowledge, all magnetically deflected picture tubes to date — monochrome or color — regardless of make. Basing diagrams and pertinent data for 258 tubes are presented in easy-to-use form. As an additional aid to the television serviceman, bold-face type highlights the important characteristics that differ among similar tube types having different suffix letters, such as 20DP4, A, B, and C.

### MONOCHROME SECTION

| Type No. | Face-plate Description (See Notes) | Envelope | Screen | Deflection Angle (Approx.) | Focusing      | Basing | Max. Over-all Length (in.) | Max. Diameter or Ht. x Wd. (in.) | Min. Useful Screen Diam. or Ht. x Wd. (in.) | Max. Neck Length | Capacitance (μF) between Bulb Coating and Anode Min. Max. | Bulb Contact | Ion Trap | Max. Ratings†    |            | Typical Operation and Characteristics |                    |            |                             |                                       | Type No. |
|----------|------------------------------------|----------|--------|----------------------------|---------------|--------|----------------------------|----------------------------------|---|------------------|---|--------------|----------|------------------|------------|---------------------------------------|--------------------|------------|-----------------------------|---------------------------------------|----------|
|          |                                    |          |        |                            |               |        |                            |                                  |   |                  |   |              |          | Applied Voltages |            | Applied Voltages                      |                    |            | Grid No. 1 (Visual Cut-off) | Focusing Cell Current (ma.) (approx.) |          |
|          |                                    |          |        |                            |               |        |                            |                                  |   |                  |   |              |          | Anode            | Grid No. 2 | Anode                                 | Focusing Electrode | Grid No. 2 |                             |                                       |          |
| 3NP4     | C, S, Ro                           | Glass    | Alum.  | 42°                        | Magnetic      | 5BV    | 10 3/4                     | 2 1/2                            | Projection Type                             | 7 1/2            | 275-375   | Ball         | None     | 25,000           | —          | 24,000                                | —                  | —          | -60                         | 120                                   | 3NP4     |
| 5ACP4    | C, S, Ro                           | Glass    | Alum.  | 53°                        | Electro.      | 8EQ    | 11 1/2                     | 5 1/2                            | 12S   | 7 3/4            | No Coating  | Ball         | None     | 18,000           | 410        | 12,000                                | 0                  | 250        | -27 to -63                  | —                                     | 5ACP4    |
| 5AXP4    | C, S, Ro                           | Glass    | Alum.  | 53°                        | Auto-Electro. | 12S    | 11                         | 5 1/2                            | 12AA  | 7 1/4            | No Coating  | Cavity       | None     | 18,000           | 500        | 14,000                                | —                  | 300        | -28 to -72                  | —                                     | 5AXP4    |
| 5AZP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12AA   | 12 3/8                     | 5 1/2                            | Projection Type                             | 8 3/2            | No Coating  | Cable        | None     | 40,000           | 400        | 35,000                                | 6650 to 8100       | 200        | -55                         | —                                     | 5AZP4    |
| 5FP4A    | C, S, Ro                           | Glass    | Alum.  | 53°                        | Magnetic      | 5AN    | 11 1/2                     | 5 1/2                            | 5AN   | 4 1/4            | No Coating  | Ball         | None     | 8,000            | 410        | 6,000                                 | —                  | 250        | -25 to -70                  | 122                                   | 5FP4A    |
| 5OP4     | C, S, Ro                           | Glass    | Alum.  | 53°                        | Magnetic      | 5AN    | 11 1/2                     | 5 1/2                            | 5AN   | 4 1/4            | No Coating  | Ball         | None     | 12,000           | 410        | 10,000                                | —                  | 300        | -28 to -72                  | 137                                   | 5OP4     |
| 5QF4A    | C, S, Ro                           | Glass    | Alum.  | 53°                        | Magnetic      | 5AN    | 11 1/2                     | 5 1/2                            | 5AN   | 4 1/2            | No Coating  | Ball         | None     | 12,000           | 700        | 10,000                                | —                  | 300        | -28 to 72                   | 137                                   | 5QF4A    |
| 5TF4     | C, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12C    | 12 1/2                     | 5 1/2                            | Projection Type                             | 7 1/2            | 100-500   | Cavity       | None     | 27,000           | 350        | 27,000                                | 4900               | 200        | -42 to -48                  | —                                     | 5TF4     |
| 7AP4     | C, S, Ro                           | Glass    | Alum.  | 55°                        | Electro.      | 5AJ    | 13 3/8                     | 7 1/2                            | 5AJ   | 6                | No Coating  | None         | None     | 3,500            | No Grid    | 3,500                                 | 675                | —          | -67                         | —                                     | 7AP4     |
| 7CP4     | C, S, Ro                           | Glass    | Alum.  | 57°                        | Electro.      | BBQ    | 13 1/2                     | 7 1/2                            | BBQ   | 6 1/2            | No Coating  | Ball         | None     | 8,000            | 410        | 6,000                                 | 1140               | 250        | -25 to -70                  | —                                     | 7CP4     |
| 7DP4     | C, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12H    | 14 7/8                     | 7 1/2                            | 12H   | 6                | 400-1300  | Cavity       | Double   | 6,000            | 410        | 6,000                                 | 1200 to 1650       | 250        | -27 to -63                  | —                                     | 7DP4     |
| 7HP4     | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 13 3/8                     | 7 1/2                            | 12N   | 5 1/2            | 500   | Ball         | Double   | 8,800            | 450        | 6,000                                 | —                  | 250        | -33 to -77                  | 80                                    | 7HP4     |
| 7NP4     | C, S, Ro                           | Glass    | Alum.  | 35°                        | Electro.      | 14N    | 20 1/2                     | 7 3/8                            | Projection Type                             | 10 3/4           | No Coating  | Cap          | None     | 80,000           | 600        | 75,000                                | 16K to 18K         | 400-600    | -155                        | —                                     | 7NP4     |
| 7OP4     | C, S, Ro                           | Glass    | Alum.  | 52°                        | Magnetic      | 12D    | 13 1/2                     | 7 1/2                            | 12D   | 6 1/4            | No Coating  | Cavity       | Single   | 10,000           | 410        | 8,000                                 | —                  | 300        | -33 to -77                  | 80                                    | 7OP4     |
| 7RP4     | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12D    | 14 7/8                     | 7 1/2                            | 12D   | 6                | No Coating  | Cavity       | None     | 12,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 120                                   | 7RP4     |
| 7TP4     | C, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12Q    | 13 1/2                     | 7 1/2                            | 12Q   | 6                | No Coating  | Cavity       | None     | 12,000           | 410        | 10,000                                | 1170 to 1590       | 200        | -18 to -48                  | —                                     | 7TP4     |
| 7WP4     | C, S, Ro                           | Glass    | Alum.  | 35°                        | Electro.      | 14N    | 20 1/2                     | 7 3/8                            | Projection Type                             | 10 3/4           | Has Coating   | Cap          | None     | 80,000           | 600        | 75,000                                | 16K to 18K         | 400-600    | -155                        | —                                     | 7WP4     |
| 8AP4     | C, S, Ro                           | Metal    | Alum.  | 54°                        | Magnetic      | 12H    | 14 5/8                     | 8 1/2                            | 12H   | 7 3/4            | —   | Rim          | Single   | 9,000            | No Grid    | 7,000                                 | —                  | —          | -27 to -63                  | 115                                   | 8AP4     |
| 8AP4A    | C, S, Ro                           | Metal    | Alum.  | 54°                        | Magnetic      | 12H    | 14 5/8                     | 8 1/2                            | 12H   | 7 3/4            | —   | Rim          | Single   | 9,000            | No Grid    | 7,000                                 | —                  | —          | -27 to -63                  | 115                                   | 8AP4A    |
| 9AP4     | C, S, Ro                           | Glass    | Alum.  | 40°                        | Electro.      | 6AL    | 21 3/8                     | 9 1/2                            | 6AL   | 10 3/4           | No Coating  | Cap          | None     | 7,000            | 250        | 7,000                                 | 1190 to 1790       | 250        | -20 to -60                  | —                                     | 9AP4     |
| 9CP4     | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 4AF    | 13 5/8                     | 9                                | 4AF   | 8 3/8            | No Coating  | Cap          | None     | 7,000            | No Grid    | 7,000                                 | —                  | —          | -100                        | 90 to 110                             | 9CP4     |
| 10BP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 18                         | 10 3/4                           | 12N   | 9                | 500-2500  | Cavity       | Double   | 10,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 115                                   | 10BP4    |
| 10BP4A*  | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 18                         | 10 3/4                           | 12N   | 9                | 500-2500  | Cavity       | Double   | 10,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 115                                   | 10BP4A*  |
| 10BP4C   | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 18                         | 10 3/4                           | 12N   | 9                | 500-2500  | Cavity       | Single   | 10,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 110                                   | 10BP4C   |
| 10BP4D   | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 18                         | 10 3/4                           | 12N   | 9                | 500-2500  | Cavity       | Single   | 10,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 110                                   | 10BP4D   |
| 10CP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 17                         | 10 3/8                           | 12N   | 7 7/8            | 500   | Ball         | Double   | 12,000           | 450        | 9,000                                 | —                  | 250        | -27 to -63                  | 115                                   | 10CP4    |
| 10DP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12M    | 18                         | 10 3/8                           | 12M   | 9                | No Coating  | Cavity       | None     | 10,000           | 410        | 9,000                                 | 2900               | 250        | -36 to -84                  | —                                     | 10DP4    |
| 10EP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 18                         | 10 3/8                           | 12N   | 9                | Has Coating   | Ball         | Double   | 12,000           | 410        | 8,000                                 | —                  | 250        | -33 to -77                  | 132                                   | 10EP4    |
| 10FP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12N    | 18                         | 10 3/8                           | 12N   | 9                | 500-2500  | Cavity       | None     | 12,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 110                                   | 10FP4    |
| 10FP4A   | C, S, Ro                           | Glass    | Alum.  | 54°                        | Magnetic      | 12N    | 18                         | 10 3/8                           | 12N   | 9                | 500-2500  | Cavity       | None     | 12,000           | 410        | 9,000                                 | —                  | 250        | -27 to -63                  | 115                                   | 10FP4A   |
| 10MP4    | C, S, Ro                           | Glass    | Alum.  | 52°                        | Magnetic      | 12G    | 17 3/8                     | 10 3/8                           | 12G   | 9 1/2            | 500-2500  | Cavity       | Double   | 10,000           | No Grid    | 9,000                                 | —                  | —          | -27 to -63                  | 150                                   | 10MP4    |
| 10MP4A   | C, S, Ro                           | Glass    | Alum.  | 52°                        | Magnetic      | 12G    | 17 3/8                     | 10 3/8                           | 12G   | 9 1/2            | 500-2500  | Cavity       | Double   | 10,000           | No Grid    | 9,000                                 | —                  | —          | -27 to -63                  | 150                                   | 10MP4A   |
| 10RP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12L    | 16 3/4                     | 10 3/8                           | 12L   | 9 1/2            | 750-1500  | Cavity       | None     | 16,000           | 500        | 12,000                                | -48 to +260        | 300        | -28 to -72                  | —                                     | 10RP4    |
| 10SP4    | G, S, Ro                           | Glass    | Alum.  | 50°                        | Electro.      | 12M    | 17                         | 10 3/8                           | 12M   | 9 1/2            | No Coating  | Cavity       | None     | 14,000           | 410        | 12,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 10SP4    |
| 12AP4    | C, S, Ro                           | Glass    | Alum.  | 40°                        | Electro.      | 6AL    | 25 3/8                     | 12 3/8                           | 6AL   | 10               | No Coating  | Cap          | None     | 7,000            | 300        | 7,000                                 | 1190 to 1790       | 250        | -18 to -48                  | —                                     | 12AP4    |
| 12CP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 4AF    | 18 5/8                     | 12 1/2                           | 4AF   | 8                | No Coating  | Cap          | None     | 7,000            | No Grid    | 7,000                                 | —                  | —          | -110                        | —                                     | 12CP4    |
| 12JP4    | C, S, Ro                           | Glass    | Alum.  | 50°                        | Magnetic      | 12D    | 18                         | 12 1/2                           | 12D   | 10               | No Coating  | Ball         | None     | 12,000           | 410        | 10,000                                | —                  | 250        | -27 to -63                  | 146                                   | 12JP4    |
| 12KP4    | C, S, Ro                           | Glass    | Alum.  | 54°                        | Magnetic      | 12N    | 18                         | 12 1/2                           | 12N   | 11 1/4           | 500-2500  | Cavity       | None     | 12,000           | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 135                                   | 12KP4    |
| 12KP4A   | C, S, Ro                           | Glass    | Alum.  | 54°                        | Magnetic      | 12N    | 18                         | 12 1/2                           | 12N   | 11 1/4           | 500-2500  | Cavity       | None     | 12,000           | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 135                                   | 12KP4A   |
| 12LP4    | C, S, Ro                           | Glass    | Alum.  | 54°                        | Magnetic      | 12N    | 19 1/2                     | 12 1/2                           | 12N   | 11               | 700-3000  | Cavity       | Double   | 12,000           | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   | 12LP4    |

| Type No. | Face-plate Description (See Notes) | Envelope | Screen | Deflection Angle (Approx. °) | Focusing      | Basing | Max. Over-all Length (in.) | Max. Diameter or Hx.Wd. (in.) | Min. Useful Screen Diam. or Hx.Wd. (in.) | Max. Neck Length | Capacitance (µF) between Bulb Coating and Anode Min. Max. | Bulb Contact | Ion Trap | Max. Ratings |            | Typical Operation and Characteristics |                    |            |                             |                                       | Type No. |
|----------|------------------------------------|----------|--------|------------------------------|---------------|--------|----------------------------|-------------------------------|--|------------------|---|--------------|----------|--------------|------------|---------------------------------------|--------------------|------------|-----------------------------|---------------------------------------|----------|
|          |                                    |          |        |                              |               |        |                            |                               |  |                  |   |              |          | Anode        | Grid No. 2 | Anode                                 | Focusing Electrode | Grid No. 2 | Grid No. 1 (Visual Cut-off) | Focusing Coil Current (ma.) (approx.) |          |
|          |                                    |          |        |                              |               |        |                            |                               |  |                  |   |              |          |              |            |                                       |                    |            |                             |                                       |          |
| 121P4*   | G, S, Ro                           | Glass    | Alum.  | 54°                          | Magnetic      | 12N    | 19 1/2                     | 12 1/2                        | 11                                       | 8 1/2            | 750-3000  | Cavity       | Double   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   | 121P4*   |
| 121P4C   | G, S, Ro                           | Glass    | —      | 55°                          | Magnetic      | 12N    | 19 1/2                     | 12 1/2                        | 11                                       | 8 1/2            | 750-3000  | Cavity       | Double   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 100                                   | 121P4C   |
| 121P4A   | G, S, Ro                           | Glass    | —      | 55°                          | Magnetic      | 12D    | 17 1/2                     | 12 1/2                        | 11                                       | 7 1/2            | No Coating  | Ball         | Single   | 12,000       | 410        | 10,000                                | —                  | 250        | -33 to -77                  | 135                                   | 121P4A   |
| 122P4    | C, S, Ro                           | Glass    | —      | 56°                          | Magnetic      | 12D    | 18                         | 12 1/2                        | 11                                       | 7 1/2            | No Coating  | Ball         | Single   | 12,000       | 410        | 10,000                                | —                  | 250        | -27 to -63                  | 135                                   | 122P4    |
| 122P4A   | C, S, Ro                           | Glass    | —      | 54°                          | Magnetic      | 12D    | 19 1/2                     | 12 1/2                        | 11                                       | 8 1/2            | No Coating  | Cavity       | Double   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   | 122P4A   |
| 122P4B   | C, S, Ro                           | Metal    | —      | 54°                          | Magnetic      | 12D    | 19                         | 12 1/2                        | 11 1/2                                   | 8 1/2            | —   | Rim          | Double   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   | 122P4B   |
| 122P4C   | G, S, Ro                           | Metal    | —      | 54°                          | Magnetic      | 12D    | 19                         | 12 1/2                        | 11 1/2                                   | 8 1/2            | —   | Rim          | Double   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   | 122P4C   |
| 122P4D   | G, S, Ro                           | Metal    | —      | 54°                          | Magnetic      | 12D    | 19                         | 12 1/2                        | 11 1/2                                   | 8 1/2            | —   | Rim          | Double   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   | 122P4D   |
| 122P4E   | C, S, Ro                           | Glass    | —      | 55°                          | Magnetic      | 12G    | 18 3/4                     | 12 1/2                        | 11                                       | 7 1/2            | 750-3000  | Cavity       | Double   | 12,000       | No Grid    | 11,000                                | —                  | —          | -33 to -77                  | 150                                   | 122P4E   |
| 122P4F   | G, S, Ro                           | Glass    | —      | 55°                          | Magnetic      | 9CH    | 18                         | 12 1/2                        | 11 1/4                                   | 7 3/4            | 750-2000  | Special      | Single   | 12,000       | No Grid    | 10,000                                | —                  | —          | -27 to -63                  | Not Spec.                             | 122P4F   |
| 122P4G   | G, S, Ro                           | Glass    | —      | 55°                          | Magnetic      | —      | 18 1/2                     | 12 1/2                        | 8 1/4                                    | 7 1/2            | 2000  | Cavity       | Not Ind. | 9000         | 350        | 8000                                  | —                  | 250        | 30v. change                 | Not Ind.                              |          |
| 122P4H   | C, S, Ro                           | Glass    | —      | 54°                          | Auto-Electro. | 12N    | 19 1/2                     | 12 1/2                        | 11 1/4                                   | 8 1/2            | 750-3000  | Cavity       | Single   | 12,000       | 410        | 11,000                                | —                  | 250        | -33 to -77                  | —                                     |          |
| 122P4I   | C, S, Ro                           | Glass    | Alum.  | 54°                          | Magnetic      | 12N    | 18                         | 12 1/2                        | 11 1/4                                   | 7 1/2            | 500-2000  | Cavity       | Single   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 135                                   |          |
| 122P4J   | C, S, Ro                           | Glass    | Alum.  | 54°                          | Magnetic      | 12N    | 18                         | 12 1/2                        | 11 1/4                                   | 7 1/2            | 500-2000  | Cavity       | Single   | 12,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 135                                   |          |
| 122P4K   | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12N    | 17 1/2                     | 12 1/2                        | 8 1/2                                    | 7 1/2            | 500-2000  | Cavity       | Single   | 14,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   |          |
| 122P4L   | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12N    | 17 1/2                     | 12 1/2                        | 8 1/2                                    | 7 1/2            | 500-2000  | Cavity       | Single   | 14,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   |          |
| 122P4M   | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12D    | 17 1/2                     | 12 1/2                        | 8 1/2                                    | 7 1/2            | 500-2000  | Cavity       | Single   | 14,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 110                                   |          |
| 122P4N   | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12D    | 17 1/2                     | 12 1/2                        | 8 1/2                                    | 7 1/2            | No Coating  | Cavity       | Double   | 14,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 100                                   |          |
| 14EP4    | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12D    | 16 1/2                     | 9 1/2 x 12 1/2                | 8 5/8 x 11 1/8                           | 7 1/2            | 750-2000  | Cavity       | Single   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 110                                   |          |
| 14EP4A   | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12D    | 16 1/2                     | 9 1/2 x 12 1/2                | 8 5/8 x 11 1/8                           | 7 1/2            | No Coating  | Cavity       | Single   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 115                                   |          |
| 14EP4B   | F, G, S, Ro                        | Glass    | —      | 65°                          | Electro.      | 12L    | 17 1/2                     | 9 1/2 x 12 1/2                | 8 1/2 x 11 3/8                           | 7 1/2            | 750-2000  | Cavity       | Single   | 14,000       | 500        | 12,000                                | 2170 to 2940       | 300        | -33 to -77                  | —                                     |          |
| 14EP4C   | G, S, Ro                           | Glass    | —      | 65°                          | Electro.      | 12L    | 17 1/2                     | 9 1/2 x 12 1/2                | 8 1/2 x 11 3/8                           | 7 1/2            | 750-2000  | Cavity       | Single   | 14,000       | 410        | 12,000                                | -48 to +204        | 300        | -33 to -77                  | —                                     |          |
| 14EP4D   | C, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12N    | 16 1/2                     | 9 1/2 x 12 1/2                | 8 5/8 x 11 3/8                           | 7 1/2            | 500-2000  | Cap          | Single   | 10,000       | 380        | 9000                                  | —                  | 250        | -20 to -60                  | —                                     |          |
| 14EP4E   | C, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12N    | 16 1/2                     | 9 1/2 x 12 1/2                | 8 5/8 x 11 3/8                           | 7 1/2            | 1200  | Cap          | Single   | 14,000       | 410        | 12,000                                | —                  | 250        | 30v. change                 | —                                     |          |
| 14EP4F   | G, S, Ro                           | Glass    | —      | 65°                          | Electro.      | 12L    | 16 1/2                     | 9 1/2 x 12 1/2                | 8 1/2 x 11 3/8                           | 7 1/2            | 600-900   | Cavity       | Single   | 14,000       | 500        | 12,000                                | -150 to +350       | 250        | -26 to -72                  | —                                     |          |
| 15AP4    | C, S, Ro                           | Glass    | —      | 52°                          | Magnetic      | 12D    | 20 1/2                     | 15 3/4                        | 13 1/2                                   | 7 1/2            | No Coating  | Ball         | None     | 15,000       | 410        | 12,000                                | —                  | 250        | -27 to -63                  | 159                                   |          |
| 15AP4A   | C, S, Ro                           | Glass    | —      | 52°                          | Magnetic      | 12D    | 20 1/2                     | 15 3/4                        | 13 1/2                                   | 7 1/2            | No Coating  | Cavity       | Double   | 15,000       | 410        | 9000-15,000                           | —                  | 250        | -27 to -63                  | 115                                   |          |
| 15AP4B   | C, S, Ro                           | Glass    | —      | 57°                          | Magnetic      | 12D    | 20 1/2                     | 15 3/4                        | 14                                       | 7 1/2            | No Coating  | Ball         | Single   | 15,000       | 410        | 13,000                                | —                  | 250        | -27 to -63                  | 146                                   |          |
| 15AP4C   | C, S, Ro                           | Glass    | —      | 52°                          | Magnetic      | —      | 22 3/4                     | 15 1/2                        | 10 1/2                                   | 8 3/4            | 500-2000  | Ball         | Not Ind. | 10,000       | 380        | 9000                                  | —                  | 250        | 30v. change                 | Not Ind.                              |          |
| 16BP4    | G, S, Ro                           | Glass    | —      | 60°                          | Auto-Electro. | 12N    | 19 1/2                     | 11 1/2 x 14 3/8               | 10 1/2 x 13 1/2                          | 7 1/2            | 750-1500  | Cavity       | Single   | 16,000       | 500        | 12,000-14,000                         | —                  | 300        | -33 to -77                  | —                                     |          |
| 16BP4A   | C, S, Ro                           | Glass    | —      | 60°                          | Auto-Electro. | 12N    | 21 1/2                     | 16                            | 15 1/4                                   | 8 1/4            | 2000  | Cavity       | Single   | 14,000       | 410        | 12,000-13,000                         | —                  | 250        | -33 to -68                  | —                                     |          |
| 16BP4B   | G, S, Ro                           | Glass    | —      | 65°                          | Electro.      | 12L    | 19 1/2                     | 11 1/2 x 14 3/8               | 10 1/2 x 13 1/2                          | 7 1/2            | 750-1500  | Cavity       | Single   | 16,000       | 410        | 12,000-14,000                         | -64 to +350        | 300        | -33 to -77                  | —                                     |          |
| 16BP4C   | C, S, Ro                           | Glass    | Alum.  | 65°                          | Electro.      | 12L    | 19 1/2                     | 11 1/2 x 14 3/8               | 10 1/2 x 13 1/2                          | 8 1/4            | Has Coating   | Cavity       | None     | 16,000       | 410        | 12,000                                | 0                  | 250        | -27 to -63                  | —                                     |          |
| 16BP4D   | C, S, Ro                           | Metal    | —      | 53°                          | Magnetic      | 12D    | 22 1/2                     | 16                            | 14 3/8                                   | 7 3/4            | —   | Rim          | Double   | 14,000       | 410        | 9000-12,000                           | —                  | 300        | -33 to -77                  | 89                                    |          |
| 16BP4E   | G, S, Ro                           | Metal    | —      | 53°                          | Magnetic      | 12D    | 22 1/2                     | 16                            | 14 3/8                                   | 7 3/4            | —   | Rim          | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 89                                    |          |
| 16BP4F   | G, F, S, Ro                        | Metal    | —      | 53°                          | Magnetic      | 12D    | 22 1/2                     | 16                            | 14 3/8                                   | 7 3/4            | —   | Rim          | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 89                                    |          |
| 16BP4G   | C, S, Ro                           | Glass    | —      | 52°                          | Magnetic      | 12D    | 21 1/2                     | 15 1/2                        | 15                                       | 6 1/2            | No Coating  | Cavity       | Double   | 15,000       | 410        | 12,000                                | —                  | 250        | -27 to -63                  | 110                                   |          |
| 16BP4H   | C, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12D    | 21                         | 16                            | 14 1/2                                   | 7 1/2            | No Coating  | Cavity       | Double   | 15,000       | 410        | 9000-12,000                           | —                  | 250        | -33 to -77                  | 115                                   |          |
| 16BP4I   | G, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12D    | 21                         | 16                            | 14 1/2                                   | 7 1/2            | No Coating  | Cavity       | Double   | 15,000       | 410        | 9000-12,000                           | —                  | 250        | -27 to -63                  | 115                                   |          |
| 16EP4    | C, S, Ro                           | Metal    | —      | 60°                          | Magnetic      | 12D    | 20                         | 16                            | 14 3/8                                   | 6 1/2            | —   | Rim          | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 105                                   |          |
| 16EP4A   | G, S, Ro                           | Metal    | —      | 60°                          | Magnetic      | 12D    | 20                         | 16                            | 14 3/8                                   | 6 1/2            | —   | Rim          | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 105                                   |          |
| 16EP4B   | G, T, S, Ro                        | Metal    | —      | 60°                          | Magnetic      | 12D    | 20                         | 16                            | 14 3/8                                   | 6 1/2            | —   | Rim          | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 105                                   |          |
| 16EP4C   | C, S, Ro                           | Glass    | —      | 62°                          | Magnetic      | 12D    | 20 1/2                     | 16 1/2                        | 15                                       | 7 1/2            | No Coating  | Ball         | Single   | 16,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 140                                   |          |
| 16EP4D   | C, S, Ro                           | Metal    | —      | 70°                          | Magnetic      | 12D    | 17 1/2                     | 16                            | 14 3/8                                   | 7                | —   | Rim          | Single   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 100                                   |          |
| 16EP4E   | C, S, Ro                           | Metal    | —      | 70°                          | Magnetic      | 12D    | 17 1/2                     | 16                            | 14 3/8                                   | 7                | —   | Rim          | Single   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 100                                   |          |
| 16EP4F   | C, F, S, Ro                        | Metal    | —      | 70°                          | Magnetic      | 12D    | 17 1/2                     | 16                            | 14 3/8                                   | 7                | —   | Rim          | Single   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 100                                   |          |
| 16EP4G   | C, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12D    | 21 1/2                     | 16                            | 14 1/2                                   | 8 1/2            | 1500-3500   | Cavity       | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 110                                   |          |
| 16HP4    | C, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12N    | 21 1/2                     | 16                            | 14 1/2                                   | 8 1/2            | 1500-3500   | Cavity       | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 110                                   |          |
| 16HP4A   | G, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12N    | 21 1/2                     | 16 1/2                        | 15                                       | 7 1/2            | 750-2000  | Cavity       | Double   | 14,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 115                                   |          |
| 16HP4B   | G, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12N    | 21 1/2                     | 16 1/2                        | 15                                       | 7 1/2            | 750-2000  | Cavity       | Double   | 14,000       | 410        | 11,000                                | —                  | 250        | -27 to -63                  | 115                                   |          |
| 16HP4C   | G, S, Ro                           | Glass    | —      | 65°                          | Magnetic      | 12N    | 19 1/2                     | 11 1/2 x 14 3/8               | 10 1/2 x 13 1/2                          | 7 1/2            | 750-1500  | Cavity       | Single   | 16,000       | 410        | 12,000-16,000                         | —                  | 300        | -33 to -77                  | 108                                   |          |
| 16HP4D   | G, S, Ro                           | Glass    | Alum.  | 65°                          | Magnetic      | 12N    | 19 1/2                     | 11 1/2 x 14 3/8               | 10 1/2 x 13 1/2                          | 7 1/2            | 750-1500  | Cavity       | Single   | 16,000       | 410        | 14,000                                | —                  | 300        | -33 to -77                  | 108                                   |          |
| 16HP4E   | C, S, Ro                           | Glass    | —      | 52°                          | Magnetic      | 12N    | 22 1/2                     | 16                            | 14 1/2                                   | 7 1/2            | 1500-3500   | Cavity       | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 110                                   |          |
| 16HP4F   | G, S, Ro                           | Glass    | —      | 52°                          | Magnetic      | 12N    | 22 1/2                     | 16                            | 14 1/2                                   | 7 1/2            | 750-2000  | Cavity       | Double   | 14,000       | 410        | 12,000-14,000                         | —                  | 300        | -33 to -77                  | 110                                   |          |
| 16MP4    | C, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12N    | 22 1/2                     | 16 1/2                        | 14 3/8                                   | 8 1/2            | 1500-3500   | Cavity       | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 110                                   |          |
| 16MP4A   | C, S, Ro                           | Glass    | —      | 60°                          | Magnetic      | 12N    | 22 1/2                     | 16 1/2                        | 14 3/8                                   | 8 1/2            | 1500-3500   | Cavity       | Double   | 14,000       | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 110                                   |          |
| 16QP4    | G, S, Ro                           | Glass    |        |                              |               |        |                            |                               |  |                  |   |              |          |              |            |                                       |                    |            |                             |                                       |          |



| Type No. | Face-plate Description (See Notes) | Envelope | Screen | Deflection Angle (Approx.) <sup>†</sup> | Focusing      | Basing | Max. Over-all Length (in.) | Max. Diameter or Ht. x Wd. (in.) | Min. Useful Screen Diam. or Ht. x Wd. (in.) | Max. Neck Length | Capacitance (μF) between Bulb Cooling and Anode Min. Max. | Bulb Contact | Ion Trap | Max. Ratings <sup>‡</sup> |            | Typical Operation and Characteristics |                    |            |                             |                                       | Type No. |
|----------|------------------------------------|----------|--------|---|---------------|--------|----------------------------|----------------------------------|---|------------------|---|--------------|----------|---------------------------|------------|---------------------------------------|--------------------|------------|-----------------------------|---------------------------------------|----------|
|          |                                    |          |        |   |               |        |                            |                                  |   |                  |   |              |          | Applied Voltages          |            | Applied Voltages                      |                    |            | Grid No. 1 (Visual Cut-off) | Focusing Coil Current (ma.) (approx.) |          |
|          |                                    |          |        |   |               |        |                            |                                  |   |                  |   |              |          | Anode                     | Grid No. 2 | Anode                                 | Focusing Electrode | Grid No. 2 |                             |                                       |          |
| 20CP40*  | G, S, Re                           | Glass    | Alum.  | 66°                                     | Magnetic      | 12N    | 21 1/16                    | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 95                                    | 20CP40*  |
| 20DP4    | G, S, Re                           | Glass    | —      | 65°                                     | Magnetic      | 12D    | 21 3/4                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 95                                    | 20DP4    |
| 20DP4A*  | G, S, Re                           | Glass    | Alum.  | 65°                                     | Magnetic      | 12D    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 410        | 12,000                                | —                  | 300        | -33 to -77                  | 95                                    | 20DP4A*  |
| 20DP4B*  | G, S, Re                           | Glass    | Alum.  | 66°                                     | Magnetic      | 12N    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 410        | 16,000                                | —                  | 300        | -28 to -72                  | 95                                    | 20DP4B*  |
| 20DP4C*  | G, S, Re                           | Glass    | Alum.  | 66°                                     | Magnetic      | 12N    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 410        | 16,000                                | —                  | 300        | -28 to -72                  | 95                                    | 20DP4C*  |
| 20FP4    | G, S, Re                           | Glass    | —      | 66°                                     | Electro.      | 12M    | 22 1/8                     | 15 1/16 x 18 1/16                | 13 1/4 x 17 1/4                             | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 410        | 12,000                                | 2300 to 3200       | 300        | -33 to -77                  | —                                     | 20FP4    |
| 20GP4    | G, S, Re                           | Glass    | —      | 66°                                     | Electro.      | 12L    | 22 1/8                     | 15 1/16 x 18 1/16                | 13 1/4 x 17 1/4                             | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 14,000                                | 2750 to 3740       | 300        | -33 to -77                  | —                                     | 20GP4    |
| 20HP4    | G, S, Re                           | Glass    | —      | 66°                                     | Electro.      | 12M    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | No Coating  | Cavity       | Single   | 16,000                    | 500        | 14,000                                | -56 to +310        | 300        | -33 to -77                  | —                                     | 20HP4    |
| 20HP4A*  | G, S, Re                           | Glass    | —      | 66°                                     | Electro.      | 12L    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 750-1500  | Cavity       | Single   | 16,000                    | 500        | 14,000                                | -56 to +310        | 300        | -33 to -77                  | —                                     | 20HP4A*  |
| 20HP4B   | G, T, S, Ro                        | Glass    | —      | 66°                                     | Electro.      | 12M    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | No Coating  | Cavity       | Single   | 16,000                    | 500        | 14,000                                | -56 to +310        | 300        | -33 to -77                  | —                                     | 20HP4B   |
| 20HP4C*  | G, S, Re                           | Glass    | Alum.  | 66°                                     | Electro.      | 12M    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | No Coating  | Cavity       | Single   | 16,000                    | 500        | 14,000                                | -56 to +310        | 300        | -28 to -72                  | —                                     | 20HP4C*  |
| 20HP4D*  | G, S, Re                           | Glass    | Alum.  | 66°                                     | Electro.      | 12L    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 500-750   | Cavity       | Single   | 16,000                    | 500        | 14,000                                | -56 to +310        | 300        | -28 to -72                  | —                                     | 20HP4D*  |
| 20JP4    | G, S, Re                           | Glass    | —      | 65°                                     | Auto-Electro. | 12P    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 12,000                                | —                  | 300        | -33 to -77                  | —                                     | 20JP4    |
| 20LP4    | G, S, Re                           | Glass    | —      | 66°                                     | Electro.      | 12L    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 750-1500  | Cavity       | Single   | 16,000                    | 500        | 14,000                                | —                  | 300        | -33 to -77                  | —                                     | 20LP4    |
| 20MP4    | G, S, Re                           | Glass    | —      | 66°                                     | Electro.      | 12L    | 22 1/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 500-750   | Cavity       | Single   | 16,000                    | 500        | 14,000                                | -55 to +300        | 300        | -33 to -77                  | —                                     | 20MP4    |
| 21ACP4   | G, S, Re                           | Glass    | —      | 85°                                     | Magnetic      | 12N    | 20 3/8                     | 16 1/2 x 20 3/8                  | 14 1/8 x 18 1/8                             | 7 1/16           | 500-750   | Cavity       | Single   | 20,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | 117                                   | 21ACP4   |
| 21ACP4A  | G, S, Re                           | Glass    | Alum.  | 85°                                     | Magnetic      | 12N    | 20 3/8                     | 16 1/2 x 20 3/8                  | 14 1/8 x 18 1/8                             | 7 1/16           | 500-750   | Cavity       | Single   | 20,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | 117                                   | 21ACP4A  |
| 21AFP4   | G, S, Re                           | Glass    | —      | 65°                                     | Electro.      | 12M    | 23 3/8                     | 15 1/16 x 20 3/8                 | 14 1/8 x 19 1/8                             | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 500        | 16,000                                | -64 to +350        | 300        | -28 to -72                  | —                                     | 21AFP4   |
| 21AFP4A* | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 14,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 21AFP4A* |
| 21ALP4   | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 14,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 21ALP4   |
| 21ALP4A* | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 14,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 21ALP4A* |
| 21ALP4B  | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 20,000                    | 500        | 14,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 21ALP4B  |
| 21AMP4   | G, S, Re                           | Glass    | Alum.  | 85°                                     | Magnetic      | 12N    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | 102                                   | 21AMP4   |
| 21AMP4A* | G, S, Re                           | Glass    | Alum.  | 85°                                     | Magnetic      | 12N    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | 102                                   | 21AMP4A* |
| 21AMP23A | G, S, Re                           | Glass    | Alum.  | 85°                                     | Magnetic      | 12N    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 16,000                                | -55 to +300        | 300        | -28 to -72                  | 102                                   | 21AMP23A |
| 21ANP4   | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12M    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 500        | 14,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 21ANP4   |
| 21ANP4A* | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12M    | 20 7/16                    | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 500        | 14,000                                | -55 to +300        | 300        | -28 to -72                  | —                                     | 21ANP4A* |
| 21AP4*   | G, F, S, Re                        | Metal    | —      | 66°                                     | Magnetic      | 12D    | 22 3/8                     | 15 1/16 x 19 3/8                 | 13 1/16 x 18 1/8                            | 7 3/16           | —   | Rim          | Single   | 18,000                    | 500        | 14,000-18,000                         | —                  | 300        | -33 to -77                  | 104                                   | 21AP4*   |
| 21AQP4   | G, S, Re                           | Glass    | Alum.  | 85°                                     | Magnetic      | 12D    | 22 3/8                     | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | 102                                   | 21AQP4   |
| 21ARP4   | G, S, Re                           | Glass    | Alum.  | 65°                                     | Int. Magnetic | 12N    | 23 1/2                     | 15 1/16 x 20 3/8                 | 14 1/8 x 19 1/8                             | 7 1/16           | 500-750   | Cavity       | Internal | 20,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | —                                     | 21ARP4   |
| 21ARP4A  | G, S, Re                           | Glass    | Alum.  | 65°                                     | Int. Magnetic | 12N    | 23 1/2                     | 15 1/16 x 20 3/8                 | 14 1/8 x 19 1/8                             | 7 1/16           | 500-750   | Cavity       | None     | 20,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | —                                     | 21ARP4A  |
| 21ASP4   | G, S, Re                           | Glass    | Alum.  | 66°                                     | Electro.      | 12M    | 22 3/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 410        | 16,000                                | -64 to +352        | 300        | -28 to -72                  | —                                     | 21ASP4   |
| 21ATP4*  | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 3/8                     | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 1200-1500   | Cavity       | Single   | 18,000                    | 500        | 16,000                                | -64 to +350        | 300        | -28 to -72                  | —                                     | 21ATP4*  |
| 21ATP4A  | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 3/8                     | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 1200-1500   | Cavity       | Single   | 18,000                    | 500        | 16,000                                | -64 to +350        | 300        | -28 to -72                  | —                                     | 21ATP4A  |
| 21AUP4   | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 18,000                                | -72 to +396        | 300        | -28 to -72                  | —                                     | 21AUP4   |
| 21AUP4A* | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 18,000                                | -72 to +396        | 300        | -28 to -72                  | —                                     | 21AUP4A* |
| 21AUP4B  | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | Single   | 20,000                    | 500        | 18,000                                | -72 to +396        | 300        | -28 to -72                  | —                                     | 21AUP4B  |
| 21AVP4   | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 1200-1500   | Cavity       | Single   | 18,000                    | 500        | 18,000                                | -72 to +396        | 300        | -28 to -72                  | —                                     | 21AVP4   |
| 21AVP4A* | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 1200-1500   | Cavity       | Single   | 18,000                    | 500        | 18,000                                | -72 to +396        | 300        | -28 to -72                  | —                                     | 21AVP4A* |
| 21AVP4B  | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 1200-1500   | Cavity       | Single   | 20,000                    | 500        | 18,000                                | -72 to +396        | 300        | -28 to -72                  | —                                     | 21AVP4B  |
| 21AWP4*  | G, S, Re                           | Glass    | Alum.  | 67°                                     | Magnetic      | 12N    | 23 1/2                     | 16 1/16 x 20 7/16                | 15 x 19 1/16                                | 7 1/16           | 750-1500  | Cavity       | Single   | 18,000                    | 500        | 16,000                                | —                  | 300        | -28 to -72                  | 95                                    | 21AWP4*  |
| 21AYP4   | G, S, Re                           | Glass    | Alum.  | 66°                                     | Electro.      | 12L    | 22 3/8                     | 15 1/16 x 18 1/16                | 12 3/4 x 17                                 | 7 1/16           | 750-1500  | Cavity       | Single   | 18,000                    | 410        | 16,000                                | -64 to +352        | 300        | -28 to -72                  | —                                     | 21AYP4   |
| 21BAP4   | G, S, Re                           | Glass    | —      | 85°                                     | Electro.      | 12L    | 20 3/8                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | None     | 20,000                    | 500        | 16,000                                | 0 to 500           | 300        | -28 to -72                  | —                                     | 21BAP4   |
| 21BCP4   | G, S, Re                           | Glass    | Alum.  | 65°                                     | Electro.      | 12L    | 23 1/2                     | 15 1/16 x 20 3/8                 | 14 1/8 x 20 3/8                             | 7 1/16           | 500-750   | Cavity       | None     | 20,000                    | 500        | 16,000                                | +50 to +550        | 300        | -28 to -72                  | —                                     | 21BCP4   |
| 21BDP4   | G, S, Re                           | Glass    | Alum.  | 67°                                     | Electro.      | 12L    | 23 1/2                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 500-750   | Cavity       | None     | 20,000                    | 500        | 16,000                                | +50 to +550        | 300        | -28 to -72                  | —                                     | 21BDP4   |
| 21BNP4   | G, S, Re                           | Glass    | Alum.  | 85°                                     | Electro.      | 12L    | 20 3/8                     | 16 1/2 x 20 3/8                  | 15 x 19 1/16                                | 7 1/16           | 1200-1500   | Cavity       | None     | 20,000                    | 500        | 16,000                                | 0 to 500           | 300        | -28 to -72                  | —                                     | 21BNP4   |
| 21DP4    | G, F, S, Re                        | Metal    | —      | 66°                                     | Electro.      | 12M    | 22 3/8                     | 15 1/16 x 19 3/8                 | 13 1/16 x 18 1/8                            | 7 1/16           | —   | Rim          | Single   | 18,000                    | 500        | 14,000-18,000                         | 2750 to 3740       | 300        | -33 to -77                  | —                                     | 21DP4    |
| 21EP4    | G, Cy, Re                          | Glass    | —      | 65°                                     | Magnetic      | 12D    | 23 3/8                     | 15 3/4 x 20 7/16                 | 13 7/8 x 19 1/8                             | 7 1/16           | No Coating  | Cavity       | Single   | 18,000                    | 500        | 16,000                                | —                  | 300        | -33 to -77                  | 95                                    | 21EP4    |
| 21FP4A*  | G, Cy, Re                          | Glass    | Alum.  | 65°                                     | Magnetic      | 12N    | 23 3/8                     | 15 3/4 x 20 7/16                 | 13 7/8 x 19 1/8                             | 7 1/16           | 500-750   | Cavity       | Single   | 18,000                    | 500        | 16,000                                | —                  | 300        | -33 to -77                  | 95                                    | 21FP4A*  |
| 21FP4B*  | G, Cy, Re                          | Glass    | Alum.  | 65°                                     | Magnetic      | 12N    | 23 3/8                     | 15 3/4 x 20 7/16                 | 13 7/8 x 19 1/8                             | 7 1/16           | 500-750   |              |          |                           |            |                                       |                    |            |                             |                                       |          |



# TELEVISION PICTURE TUBES

## MONOCHROME SECTION

| Type No. | Face-plate Description (See Notes) | Envelope | Screen | Deflection Angle (Approx.) § | Focusing | Basing | Max. Over-all Length (in.) | Max. Diameter or Ht. x Wd. (in.) | Min. Useful Screen Diam. or Ht. x Wd. (in.) | Max. Neck Length (in.) | Capacitance (µµf) between Bulb Coating and Anode Min. Max. | Bulb Contact | Ion Trap | Max. Ratings † |            | Typical Operation and Characteristics |             |                    |            |                             |                                       | Type No. |
|----------|------------------------------------|----------|--------|------------------------------|----------|--------|----------------------------|----------------------------------|---|------------------------|--|--------------|----------|----------------|------------|---------------------------------------|-------------|--------------------|------------|-----------------------------|---------------------------------------|----------|
|          |                                    |          |        |                              |          |        |                            |                                  |   |                        |  |              |          | Anode          | Grid No. 2 | Applied Voltages                      |             |                    |            | Grid No. 1 (Visual Cut-off) | Focusing Coil Current (ma.) (approx.) |          |
|          |                                    |          |        |                              |          |        |                            |                                  |   |                        |  |              |          |                |            | Anode                                 | Grid No. 2  | Focusing Electrode | Grid No. 2 |                             |                                       |          |
| 22AP4A   | G. S. Ro                           | Metal    | —      | 70°                          | Magnetic | 12D    | 23 3/8                     | 21 1/8                           | 20 1/4                                      | 7 1/2                  | —  | Rim          | Single   | 19,000         | 410        | 14,000                                | —           | 300                | -33 to -77 | 117                         | 22AP4A                                |          |
| 24AP4    | G. S. Ro                           | Metal    | —      | 70°                          | Magnetic | 12D    | 24 1/8                     | 24 1/4                           | 22 1/2                                      | 7 1/2                  | —  | Rim          | Single   | 16,000         | 410        | 15,000                                | —           | 300                | -33 to -77 | 114                         | 24AP4                                 |          |
| 24AP4B   | G. T. S. Ro                        | Metal    | Alum.  | 70°                          | Magnetic | 12D    | 24 1/8                     | 24 1/4                           | 22 1/2                                      | 7 1/2                  | —  | Rim          | Single   | 16,000         | 410        | 15,000                                | —           | 300                | -33 to -77 | 114                         | 24AP4B                                |          |
| 24BP4    | G. S. Ro                           | Metal    | —      | 70°                          | Electro. | 12M    | 24 3/8                     | 24 1/2                           | 22 1/2                                      | 7 1/2                  | —  | Rim          | Single   | 16,000         | 500        | 14,000                                | -56 to +310 | 300                | -33 to -77 | —                           | 24BP4                                 |          |
| 24CP4    | G. S. Ro                           | Glass    | —      | 85°                          | Magnetic | 12N    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 500-750  | Cavity       | Single   | 20,000         | 500        | 18,000                                | —           | 300                | -33 to -77 | 115                         | 24CP4                                 |          |
| 24CP4A*  | G. S. Re                           | Glass    | Alum.  | 85°                          | Magnetic | 12N    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 500-750  | Cavity       | Single   | 20,000         | 500        | 16,000                                | —           | 300                | -33 to -77 | 105                         | 24CP4A*                               |          |
| 24DP4    | G. S. Ro                           | Glass    | —      | 85°                          | Electro. | 12L    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 500-750  | Cavity       | Single   | 20,000         | 500        | 18,000                                | -72 to +400 | 300                | -33 to -77 | —                           | 24DP4                                 |          |
| 24DP4A*  | G. S. Ro                           | Glass    | Alum.  | 85°                          | Electro. | 12L    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 500-750  | Cavity       | Single   | 20,000         | 500        | 16,000                                | -64 to +350 | 300                | -28 to -72 | —                           | 24DP4A*                               |          |
| 24QP4    | G. S. Re                           | Glass    | —      | 85°                          | Magnetic | 12N    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 500-750  | Cavity       | Single   | 18,000         | 500        | 16,000                                | —           | 300                | -28 to -72 | 100                         | 24QP4                                 |          |
| 24VP4*   | G. S. Re                           | Glass    | Alum.  | 85°                          | Magnetic | 12N    | 21 1/2                     | 18 9/16                          | 17 1/2 x 21 1/2                             | 7 1/2                  | 250-750  | Cavity       | Single   | 20,000         | 500        | 14,000                                | —           | 300                | -33 to -77 | 110                         | 24VP4*                                |          |
| 24VP4    | G. S. Re                           | Glass    | —      | 87°                          | Magnetic | 12N    | 21 1/2                     | 18 9/16                          | 16 1/2 x 21 3/8                             | 7 1/2                  | 750-1500   | Cavity       | Single   | 22,000         | 600        | 20,000                                | —           | 300                | -33 to -77 | 125                         | 24VP4                                 |          |
| 24VP4A*  | G. S. Re                           | Glass    | Alum.  | 87°                          | Magnetic | 12N    | 21 1/2                     | 18 9/16                          | 16 1/2 x 21 3/8                             | 7 1/2                  | 750-1500   | Cavity       | Single   | 22,000         | 600        | 20,000                                | —           | 300                | -33 to -77 | 125                         | 24VP4A*                               |          |
| 24XP4    | G. S. Re                           | Glass    | —      | 85°                          | Magnetic | 12D    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | No Coating   | Cavity       | Single   | 20,000         | 500        | 18,000                                | —           | 300                | -28 to -72 | 125                         | 24XP4                                 |          |
| 24YP4    | G. S. Re                           | Glass    | Alum.  | 85°                          | Electro. | 12L    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 1200-1500  | Cavity       | Single   | 20,000         | 500        | 16,000                                | -64 to +350 | 300                | -28 to -72 | —                           | 24YP4                                 |          |
| 24ZP4    | G. S. Re                           | Glass    | Alum.  | 85°                          | Electro. | 12L    | 21 1/2                     | 18 9/16                          | 16 3/4 x 21 1/2                             | 7 1/2                  | 500-750  | Cavity       | None     | 20,000         | 500        | 16,000                                | 0 to 500    | 300                | -28 to -72 | —                           | 24ZP4                                 |          |
| 27AP4    | G. T. S. Ro                        | Metal    | —      | 85°                          | Electro. | 12M    | 22 3/8                     | 20 1/2                           | 18 9/16 x 23 1/2                            | 7 1/2                  | —  | Rim          | Single   | 18,000         | 500        | 15,000                                | -60 to +300 | 300                | -33 to -77 | —                           | 27AP4                                 |          |
| 27EP4*   | G. S. Re                           | Glass    | Alum.  | 85°                          | Magnetic | 12D    | 23 7/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 24                                 | 7 1/2                  | No Coating   | Cavity       | Single   | 20,000         | 500        | 16,000                                | —           | 300                | -33 to -77 | 118                         | 27EP4*                                |          |
| 27GP4    | G. S. Re                           | Glass    | —      | 85°                          | Magnetic | 12D    | 23 7/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 24                                 | 7 1/2                  | No Coating   | Cavity       | Single   | 22,500         | 500        | 16,000                                | —           | 300                | -33 to -77 | 95                          | 27GP4                                 |          |
| 27IP4    | G. S. Ro                           | Glass    | Alum.  | 85°                          | Magnetic | 12N    | 24 7/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 23 1/2                             | 9 5/8                  | 250-400  | Cavity       | Single   | 22,000         | 600        | 20,000                                | —           | 300                | -33 to -77 | 148                         | 27IP4                                 |          |
| 27MP4    | G. F. S. Ho                        | Metal    | —      | 85°                          | Magnetic | 12D    | 22 3/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 23 1/2                             | 7 1/2                  | —  | Rim          | Single   | 18,000         | 500        | 16,000-18,000                         | —           | 300                | -33 to -77 | —                           | 27MP4                                 |          |
| 27NP4    | G. S. Ro                           | Glass    | —      | 85°                          | Magnetic | 12N    | 23 3/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 24 1/2                             | 7 1/2                  | 500-750  | Cavity       | Single   | 18,000         | 500        | 16,000                                | —           | 300                | -28 to -72 | 95                          | 27NP4                                 |          |
| 27RP4*   | G. S. Re                           | Glass    | Alum.  | 85°                          | Magnetic | 12D    | 23 7/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 24                                 | 7 1/2                  | 500-750  | Cavity       | Single   | 20,000         | 500        | 18,000                                | -72 to +396 | 300                | -28 to -72 | —                           | 27RP4*                                |          |
| 27SP4    | G. S. Re                           | Glass    | —      | 85°                          | Electro. | 12L    | 23 7/8                     | 20 1/2 x 25 1/2                  | 18 1/2 x 24                                 | 7 1/2                  | 500-750  | Cavity       | Single   | 20,000         | 500        | 16,000                                | 0 to 396    | 300                | -28 to -72 | —                           | 27SP4                                 |          |
| 30BP4    | G. S. Ro                           | Metal    | —      | 90°                          | Magnetic | 12D    | 24 1/8                     | 30 3/8                           | 28 1/4                                      | 7 3/8                  | —  | Rim          | Single   | 30,000         | 410        | 12,000                                | —           | 300                | -33 to -77 | 95                          | 30BP4                                 |          |

Bold-face type highlights the important characteristics that differ among similar Tube Types having different suffix letters.

### NOTES:

All tubes in this section have heater ratings of 6.3 volts and 0.6 ampere. Only tubes that are magnetically deflected are included.  
Face-Plate Code: C — clear, Cy — cylindrical, F — frosted, G — gray, Re — rectangular, Ro — round, S — spherical, T — treated.

† Design-center values.

\* Most commonly used types.

‡ Internal magnetic unit to be used with external tubular magnetic shield.

§ For rectangular tubes, the horizontal deflection angle is given.

## COLOR SECTION

| Type No. | Face-Plate Description (See Notes) | Envelope | Screen        | Deflection Angle (Approx.) § | Focusing | Convergence | Basing | Max. Over-all Length (in.) | Max. Diameter or Ht. x Wd. (in.) | Min. Useful Screen Diam. or Ht. x Wd. (in.) | Max. Neck Length (in.) | Capacitance (µµf) between Bulb Coating and Anode Min. Max. | Bulb Contact    | Max. Ratings † |            | Typical Operations and Characteristics |              |                     |                        |                             |            | Type No. |
|----------|------------------------------------|----------|---------------|------------------------------|----------|-------------|--------|----------------------------|----------------------------------|---|------------------------|--|-----------------|----------------|------------|--|--------------|---------------------|------------------------|-----------------------------|------------|----------|
|          |                                    |          |               |                              |          |             |        |                            |                                  |   |                        |  |                 | Anode          | Grid No. 2 | Applied Voltages                       |              |                     |                        | Grid No. 1 (Visual Cut-off) |            |          |
|          |                                    |          |               |                              |          |             |        |                            |                                  |   |                        |  |                 |                |            | Anode                                  | Grid No. 2   | Focusing Electrode* | Convergence Electrode† |                             | Grid No. 2 |          |
| 15GP22   | C, S, Ro                           | Glass    | Flat, Alum.   | 45°                          | Electro. | Electro.    | 15GP22 | 26 1/8                     | 15 3/4                           | 8 5/8 x 11 1/2                              | 10 5/8                 | 1500-3000  | Metal-flange    | 20,000         | 500        | 20,000                                 | 2400 to 3800 | 8500 to 10,200      | 140 to 315             | -45 to -100                 | 15GP22     |          |
| 15HP22   | C, S, Ro                           | Glass    | Sph. 1, Alum. | 45°                          | Electro. | Electro.    | 15HP22 | 26 1/8                     | 15 3/4                           | 12  | 10 1/2                 | 1500-2500  | Metal-flange    | 20,000         | 500        | 20,000                                 | 3100         | 9300                | 240                    | -45 to -100                 | 15HP22     |          |
| 19FP22   | G, S, Ro                           | Glass    | Sph. 1, Alum. | 60°                          | Electro. | Electro.    | 19FP22 | 24 3/8                     | 20 1/2                           | 12 1/2 x 16 9/16                            | 9 3/4                  | 1500-3000  | Metal-flange    | 22,000         | 500        | 20,000                                 | 1950 to 3250 | 8500 to 10,200      | 200                    | -42 to -78                  | 19FP22     |          |
| 19VP22*  | G, S, Ro                           | Glass    | Sph. 1, Alum. | 62°                          | Electro. | Magnetic    | 14W    | 26 7/8                     | 20 7/8                           | 13 1/2 x 17 1/2                             | 10 2/8                 | 1500-3000  | Metal-flange    | 27,000         | 500        | 25,000                                 | 6500 to 8000 | —                   | 150 to 330             | -45 to -100                 | 19VP22*    |          |
| 21AXP22  | G, S, Ro                           | Metal    | Sph. 1, Alum. | 70°                          | Electro. | Magnetic    | 14W    | 25 1/2                     | 21 1/4                           | 15 1/4 x 19 1/2                             | 9 2/8                  | —  | Metal-shell lip | 25,000         | 800        | 25,000                                 | 3800 to 5000 | —                   | 140 to 310             | -45 to -100                 | 21AXP22    |          |

### NOTES:

All tubes in this section contain three electron-beam sources with heater ratings of 6.3 volts and 1.8 amperes total current (heaters electrically paralleled within the tube). The screens of the tubes in this section are of the tri-color (red, green, and blue), phosphor-dot type with an associated shadow mask containing uniformly spaced perforations (one for each triad).

All tubes in this section are magnetically deflected.

Face-Plate Code: C — clear, G — gray, Ro — round, S — spherical.

† Design-center values.

\* For each of the three electron-beam sources.

‡ Does not include the dynamic convergence component.

†† Most commonly used type.

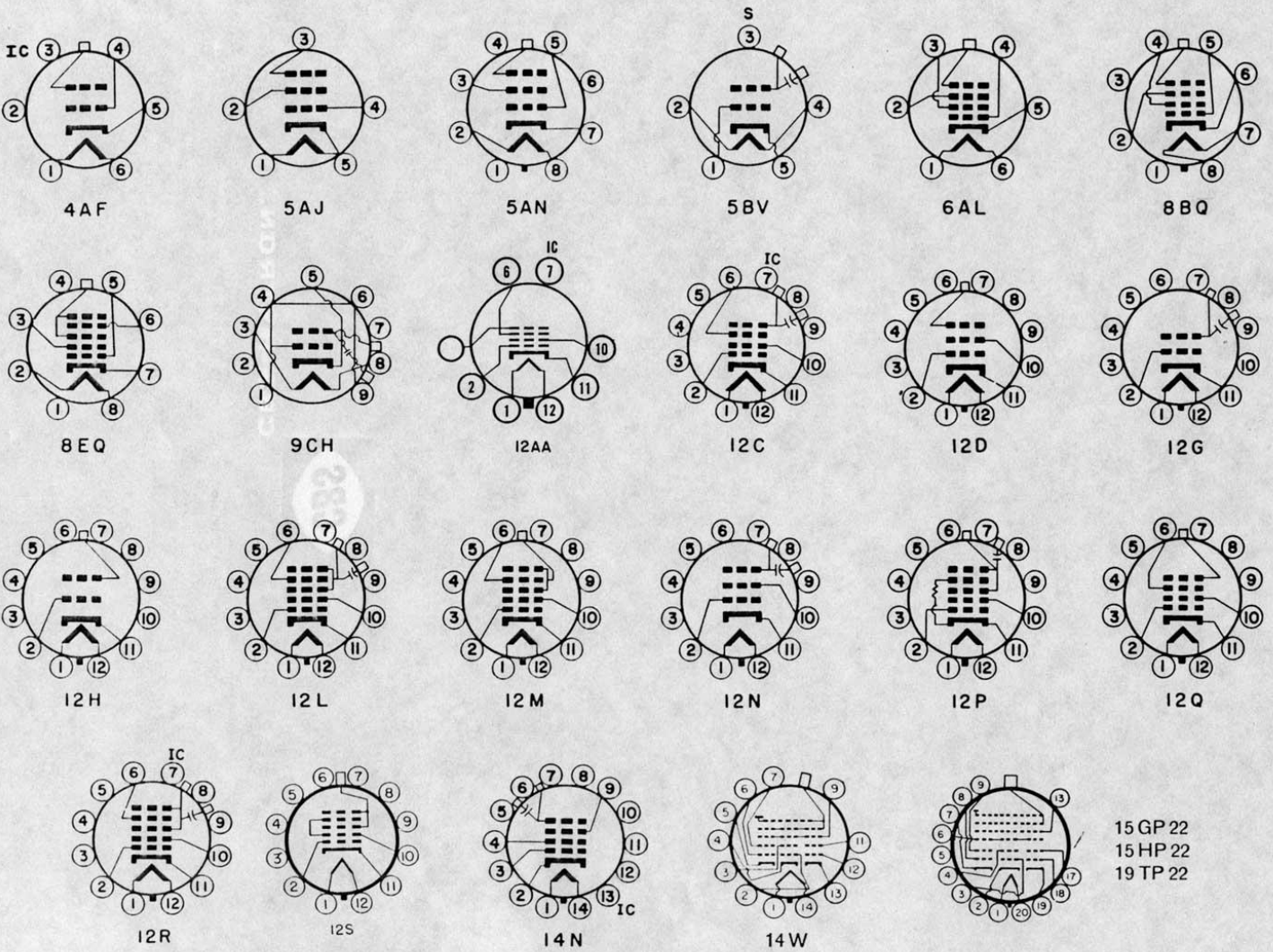
§ Screen on inner surface of face-plate.

§ Horizontal deflection angle is given.

The data in this reference guide have been compiled with the utmost care as to technical accuracy from sources we believe to be authoritative and reliable. CBS-Hytron, however, cannot assume any liability or obligation for the use or application of these data.

# BASING DIAGRAMS

## Bottom Views of Socket Connections



Courtesy of John Folsom