

Designed to Meet Military Specifications and Critical Industrial Applications

| <br>Type | Proto-<br>type | Name                   | Description and/or<br>Difference Between<br>Type and Prototype                                                           | Special Tests and Controls |                |           |              |                       |           |           |               |                |            |                     |  |  |
|-------------------------------------------------------------------------------------------|----------------|------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------|-----------|--------------|-----------------------|-----------|-----------|---------------|----------------|------------|---------------------|--|--|
|                                                                                           |                |                        |                                                                                                                          | Shock                      | Fatigue        | Vibration | Glass Strain | AF Noise, Microphones | Stability | Inertness | High Altitude | Heater Cycling | Room Temp. | Elevated Bulb Temp. |  |  |
|                                                                                           |                |                        | Rating or<br>Characteristic                                                                                              | Premium<br>Type            | Proto-<br>Type | Life Test |              |                       |           |           |               |                |            |                     |  |  |
| 0A2-WA                                                                                    | 0A2            | Voltage Regulator*     | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | —                     | ✓         | ✓         | —             | —              | —          | —                   |  |  |
| 0B2-WA                                                                                    | 0B2            | Voltage Regulator*     | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | —                     | ✓         | ✓         | —             | —              | —          | ✓                   |  |  |
| 2D21-W                                                                                    | 2D21           | Thyratron Tetrode*     | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | —            | ✓                     | —         | —         | —             | —              | —          | —                   |  |  |
| 6AC7-W                                                                                    | 6AC7           | Sharp Cutoff Pentode*■ | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | —            | ✓                     | —         | —         | —             | —              | —          | —                   |  |  |
| 6AU6-WA                                                                                   | 6AU6           | Sharp Cutoff Pentode*  | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | —                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 6J4-WA                                                                                    | 6J4            | High-Mu Triode*        | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | —         | ✓            | —                     | ✓         | ✓         | ✓             | ✓              | —          | —                   |  |  |
| 6J6-WA                                                                                    | 6J6            | Medium-Mu Twin Triode* | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 12AT7-WA                                                                                  | 12AT7          | High-Mu Twin Triode§   | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | —                   |  |  |
| 5636                                                                                      | —              | Sharp-Cutoff Pentode*  | Heater-Cathode Type. For gated amplifier, delay and mixer circuits up to 400 Mc, and gain-controlled amplifier circuits. | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5639                                                                                      | —              | Sharp-Cutoff Pentode*  | Heater-Cathode Type. For use in high-gain wide-band circuits.                                                            | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5651                                                                                      | —              | Voltage Regulator*     | For use in equipment where extreme voltage stability is required.                                                        | —                          | —              | ✓         | —            | ✓                     | —         | —         | —             | —              | ✓          | —                   |  |  |
| 5651-WA                                                                                   | —              | Voltage Regulator*     | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | —              | ✓          | ✓                   |  |  |
| 5654                                                                                      | 6AK5           | Sharp-Cutoff Pentode*  | None                                                                                                                     | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5654/<br>6AK5-W                                                                           | 6AK5           | Sharp-Cutoff Pentode*  | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5654/<br>6AK5-W/<br>6096                                                                  | 6AK5           | Sharp-Cutoff Pentode*  | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5670                                                                                      | 2C51           | Medium-Mu Twin Triode§ | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5670-WA                                                                                   | 2C51           | Medium-Mu Twin Triode§ | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5686                                                                                      | —              | Beam Power Tube§       | Heater-Cathode Type. For renewal use only.                                                                               | ✓                          | ✓              | ✓         | ✓            | —                     | ✓         | ✓         | ✓             | ✓              | ✓          | —                   |  |  |
| 5718                                                                                      | —              | Medium-Mu Triode*      | Heater-Cathode Type. Uhf amplifier and oscillator. Useful power output at 500 Mc., nearly one watt.                      | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5719                                                                                      | —              | High-Mu Triode*        | Heater-Cathode Type. Useful as an audio amplifier in mobile receivers.                                                   | ✓                          | ✓              | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |
| 5725                                                                                      | 6AS6           | Sharp-Cutoff Pentode*  | Bulb Temperature, Max. °C (at hottest point)                                                                             | 165                        | 120            | ✓         | ✓            | ✓                     | ✓         | ✓         | ✓             | ✓              | ✓          | —                   |  |  |
| 5726                                                                                      | 6AL5           | Twin Diode*            | Controlled Plate-Current Balance                                                                                         | Yes                        | No             | ✓         | ✓            | ✓                     | —         | ✓         | ✓             | ✓              | ✓          | —                   |  |  |
| 5726/<br>6AL5-W                                                                           | 6AL5           | Twin Diode*            | This type is designed to meet the indicated military specification.                                                      | ✓                          | ✓              | ✓         | ✓            | —                     | ✓         | ✓         | ✓             | ✓              | —          | ✓                   |  |  |

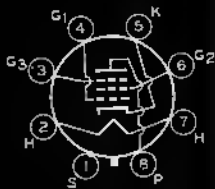
For key to terminal connections see page 30.

\* 7-pin miniature type.

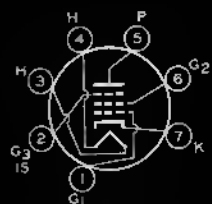
§ 9-pin miniature type.

\* Subminiature type with flexible leads.

■ Small wafer octal 8-pin type.

0A2-WA 0B2-WA  
5651 5651-WA

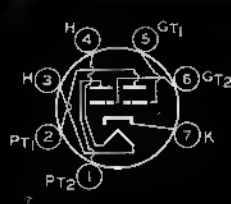
6AC7-W



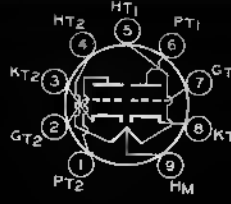
6AU6-WA



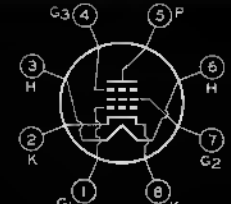
6J4-WA



6J6-WA



12AT7-WA



5636



5639

# PREMIUM TUBES

Designed to Meet Military Specifications and Critical Industrial Applications

| Cathode      |             | Maximum Dimensions<br>Inches  |               | Class of Service                               | Maximum Ratings                                                                                                                                                                                                         |                            |                        |                           | Operating Conditions and Characteristics |                                                   |                            |                      |                             |                                 |                                             |                       |                          |      | Type |
|--------------|-------------|-------------------------------|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------|---------------------------|------------------------------------------|---------------------------------------------------|----------------------------|----------------------|-----------------------------|---------------------------------|---------------------------------------------|-----------------------|--------------------------|------|------|
|              |             |                               |               |                                                | Plate Volts                                                                                                                                                                                                             | Plate Dissipation<br>Watts | Cathode Current<br>Ma. | Grid-No. 2 Input<br>Watts | Plate Supply<br>Volts                    | Grid-No. 1 Volts(v) or Cathode Resistance<br>Ohms | Grid-No. 2 Supply<br>Volts | Plate Current<br>Ma. | AC Plate Resistance<br>Ohms | Trans-conductance<br>Micro-mhos | Amplification Factor                        | Power Output<br>Watts |                          |      |      |
| Volts        | Amps.       | Length                        | Diam.         |                                                |                                                                                                                                                                                                                         |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       |                          |      |      |
| Cold Cathode |             | 2 $\frac{5}{8}$               | $\frac{3}{4}$ | Voltage Regulator                              | For data refer to MIL-E-1/290B specification <sup>▲</sup>                                                                                                                                                               |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 0A2-WA                   |      |      |
| Cold Cathode |             | 2 $\frac{5}{8}$               | $\frac{3}{4}$ | Voltage Regulator                              | For data refer to MIL-E-1/291 specification <sup>▲</sup>                                                                                                                                                                |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 0B2-WA                   |      |      |
| 6.3          | 0.6         | 2 $\frac{1}{8}$               | $\frac{3}{4}$ | High-Sensitivity Control Service               | For data refer to MIL-E-1/756B specification <sup>▲</sup>                                                                                                                                                               |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 2D21-W                   |      |      |
| 6.3          | 0.45        | 2 $\frac{5}{8}$               | —             | Class A <sub>1</sub> Amplifier                 | For data refer to MIL-E-1/354 specification <sup>▲</sup>                                                                                                                                                                |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 6AC7-W                   |      |      |
| 6.3          | 0.3         | 2 $\frac{1}{8}$               | $\frac{3}{4}$ | Class A <sub>1</sub> Amplifier                 | For data refer to MIL-E-1/1 specification <sup>▲</sup>                                                                                                                                                                  |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 6AU6-WA                  |      |      |
| 6.3          | 0.4         | 2 $\frac{1}{8}$               | $\frac{3}{4}$ | Class A <sub>1</sub> Amplifier for UHF Service | For data refer to MIL-E-1/619D specification <sup>▲</sup>                                                                                                                                                               |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 6J4-WA                   |      |      |
| 6.3          | 0.45        | 2 $\frac{1}{8}$               | $\frac{3}{4}$ | Class A <sub>1</sub> Amplifier Each Unit       | For data refer to MIL-E-243B specification <sup>▲</sup>                                                                                                                                                                 |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 6J6-WA                   |      |      |
| 6.3<br>12.6  | 0.3<br>0.15 | 2 $\frac{3}{16}$              | $\frac{7}{8}$ | Class A <sub>1</sub> Amplifier Each Unit       | For data refer to MIL-E-1/3A specification <sup>▲</sup>                                                                                                                                                                 |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 12AT7-WA                 |      |      |
| 6.3          | 0.15        | 1 $\frac{3}{8}$ $\frac{1}{4}$ | 0.383         | Class A <sub>1</sub> Amplifier                 | 165                                                                                                                                                                                                                     | 1.1                        | —                      | 0.7                       | 100<br>100                               | 150<br>150                                        | 100<br>100                 | 5.6<br>4             | 110000<br>50000             | 3200<br>1950                    | Grid-No. 3 Volts, 0<br>Grid-No. 3 Volts, -1 | —                     | —                        | 5636 |      |
| 6.3          | 0.45        | 1 $\frac{3}{4}$ $\frac{1}{4}$ | 0.4           | Class A <sub>1</sub> Amplifier                 | 165                                                                                                                                                                                                                     | 4.0                        | 40                     | 1.0                       | 150                                      | 100                                               | 100                        | 21                   | 50000                       | 9000                            | —                                           | —                     | 5639                     |      |      |
| Cold Cathode |             | 2 $\frac{1}{8}$               | $\frac{3}{4}$ | Voltage-Reference Tube                         | Ambient Temp., -55° to +90°C<br>Approx. DC Starting Volts, 107<br>Max. Starting Ma., 100 Min. DC Anode-Supply Volts, 115<br>Approx. DC Operating Volts, 87<br>Regulation Range, 1.5 to 3.5 Ma.<br>Regulation Volts, 115 |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5651                     |      |      |
| Cold Cathode |             | 2 $\frac{1}{8}$               | $\frac{3}{4}$ | Voltage-Reference Tube                         | For data refer to MIL-E-1/825A specification <sup>▲</sup>                                                                                                                                                               |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5651-WA                  |      |      |
| 6.3          | 0.175       | 1 $\frac{3}{4}$               | $\frac{3}{4}$ | Voltage-Reference Tube                         | 200                                                                                                                                                                                                                     | 1.65                       | —                      | 0.55                      | 180                                      | 180                                               | 120                        | 2.4                  | 500000                      | 5100                            | —                                           | —                     | 5654                     |      |      |
| 6.3          | 0.175       | 1 $\frac{3}{4}$               | $\frac{3}{4}$ | Voltage-Reference Tube                         | For data refer to MIL-E-1/4A specification <sup>▲</sup>                                                                                                                                                                 |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5654/<br>6AK5-W          |      |      |
| 6.3          | 0.175       | 1 $\frac{3}{4}$               | $\frac{3}{4}$ | Voltage-Reference Tube                         | For data refer to MIL-E-1/236 specification <sup>▲</sup>                                                                                                                                                                |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5654/<br>6AK5-W/<br>6096 |      |      |
| 6.3          | 0.35        | 1 $\frac{3}{4}$               | $\frac{7}{8}$ | Class A <sub>1</sub> Amplifier Each Unit       | For data refer to MIL-E-1/5C specification <sup>▲</sup>                                                                                                                                                                 |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5670                     |      |      |
| 6.3          | 0.35        | 1 $\frac{3}{4}$               | $\frac{7}{8}$ | Class A <sub>1</sub> Amplifier Each Unit       | For data refer to MIL-E-1/247 specification <sup>▲</sup>                                                                                                                                                                |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5670-WA                  |      |      |
| 6.3          | 0.35        | 2 $\frac{3}{16}$              | $\frac{7}{8}$ | Class A <sub>1</sub> Amplifier                 | 250                                                                                                                                                                                                                     | 7.5                        | —                      | 3.0                       | 250                                      | -12.5v                                            | 250                        | 27                   | 45000                       | 3100                            | —                                           | 2.7                   | 5686                     |      |      |
| 6.3          | 0.15        | 1 $\frac{3}{8}$ $\frac{1}{4}$ | 0.4           | Class C Amplifier and Oscillator               | Maximum Ratings, Absolute Values:<br>DC Plate Volts, 165 DC Grid Volts, -55 DC Plate Ma., 22<br>DC Grid Ma., 5.5 Plate Dissipation, 3.3 Watts                                                                           |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5718                     |      |      |
| 6.3          | 0.15        | 1 $\frac{3}{8}$ $\frac{1}{4}$ | 0.4           | Class A <sub>1</sub> Amplifier                 | 165                                                                                                                                                                                                                     | 0.55                       | —                      | —                         | 150                                      | 680                                               | —                          | 1.85                 | 30500                       | 2300                            | 70                                          | —                     | 5719                     |      |      |
| 6.3          | 0.175       | 1 $\frac{3}{4}$               | $\frac{3}{4}$ | Class A <sub>1</sub> Amplifier                 | 200                                                                                                                                                                                                                     | 1.65                       | 20                     | 0.55                      | 120                                      | -2v                                               | 120                        | 5.2                  | —                           | 3200                            | —                                           | —                     | 5725                     |      |      |
| 6.3          | 0.3         | 1 $\frac{3}{4}$               | $\frac{3}{4}$ | Half-Wave Rectifier                            | Maximum Ratings, Absolute Values:<br>Peak Inverse Plate Volts, 360 DC Output Ma. per Plate, 10<br>Peak Plate Ma. per Plate, 60 Peak Heater-Cathode Volts, ±360                                                          |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5726                     |      |      |
| 6.3          | 0.3         | 1 $\frac{3}{4}$               | $\frac{3}{4}$ | Half-Wave Rectifier                            | For data refer to MIL-E-1/7B specification <sup>▲</sup>                                                                                                                                                                 |                            |                        |                           |                                          |                                                   |                            |                      |                             |                                 |                                             |                       | 5726/<br>6AL5-W          |      |      |

<sup>▲</sup> A copy of this specification may be obtained from the Director of the Armed Services Electro-Standards Agency (ASESA) at Fort Monmouth, New Jersey.

<sup>†</sup> Excluding flexible leads.

