



## ELECTRONIC TUBE REFERENCE

**8168**

Power - Beam (NOT sweep) (over 1000V 100W) electronic tube

CONSOLIDATED TECHNICAL  
DATA**1 SECTION**  
CONSTRUCTION  
**TETRODE**

Forced-air-cooled ceramic-metal radial-beam tetrode designed for low-voltage high-current Class-AB linear RF and audio amplification, producing kilowatt-class output.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | —                 | BASE PINS            | —             |
| NOMINAL HEATER      | 6 V / 9 A         | PARALLEL HEATER      | — / —         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Similar       |

## SECTION RATINGS

|                                                                                                                                    |         |
|------------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>SECTION 1</b> Tetrode                                                                                                           |         |
| TRANSCONDUCTANCE                                                                                                                   | 0.037 S |
| MAXIMUM PLATE VOLTAGE                                                                                                              | 3000 V  |
| MAXIMUM SCREEN VOLTAGE                                                                                                             | 400 V   |
| MAXIMUM PLATE DISSIPATION                                                                                                          | 1000 W  |
| MAXIMUM SCREEN DISSIPATION                                                                                                         | 12 W    |
| <i>Promoted maximum ratings/characteristics populated from published headings; service-specific values retained in parameters.</i> |         |

The EIMAC 8168/4CX1000A is a ceramic/metal, forced-air cooled, radial-beam tetrode with a rated maximum plate dissipation of 1000 watts. It is a low-voltage, high-current tube specifically designed for Class-ABJ1 linear-amplifier or audio-amplifier applications where its high gain may be used to advantage. At its rated maximum plate voltage of 3000 volts, it is capable of producing 1630 watts of peak-envelope output power. Two

## SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

# 1962 Eimac

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1962 EIMAC

## Section 1 · Tetrode

| OTHER                                                                      |                     |                                                                             |
|----------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------|
| PARAMETER                                                                  | PUBLISHED VALUE     | CONDITION / NOTE                                                            |
| radial-beam tetrode with a rated maximum plate dissipation of              | <b>1000 W</b>       | radial-beam tetrode with a rated maximum plate dissipation of 1000 watts.   |
| It is a low-voltage, high-current tube specifically designed for Class-AB] | <b>1</b>            | It is a low-voltage, high-current tube specifically designed for Class-AB]1 |
| be used to advantage. At its rated maximum plate voltage of                | <b>3000 V</b>       | be used to advantage. At its rated maximum plate voltage of 3000 volts, it  |
| is capable of producing                                                    | <b>1630 W</b>       | is capable of producing 1630 watts of peak-envelope output power. Two       |
| Heater: Voltage [1]                                                        | <b>0</b>            | Heater: Voltage .....00iiiiinnns 6.0 + 0.3                                  |
| Heater: Voltage [2]                                                        | <b>6</b>            | Heater: Voltage .....00iiiiinnns 6.0 + 0.3                                  |
| Heater: Voltage [3]                                                        | <b>0.3</b>          | Heater: Voltage .....00iiiiinnns 6.0 + 0.3                                  |
| Current, at [1]                                                            | <b>6 V</b>          | Current, at 6.0 volts .. ...o 9.0                                           |
| Current, at [2]                                                            | <b>9 V</b>          | Current, at 6.0 volts .. ...o 9.0                                           |
| Direct Interelectrode Capacitances (grounded cathode)                      | <b>2</b>            | Direct Interelectrode Capacitances (grounded cathode)2                      |
| Input [1]                                                                  | <b>500000005 pF</b> | Input ..... 500000005 0005300 0000005060 0φ0 81 pF                          |
| Input [2]                                                                  | <b>5300 pF</b>      | Input ..... 500000005 0005300 0000005060 0φ0 81 pF                          |
| Input [3]                                                                  | <b>5060 pF</b>      | Input ..... 500000005 0005300 0000005060 0φ0 81 pF                          |
| Input [4]                                                                  | <b>0 pF</b>         | Input ..... 500000005 0005300 0000005060 0φ0 81 pF                          |
|                                                                            |                     |                                                                             |

| PARAMETER                                                          | PUBLISHED VALUE | CONDITION / NOTE                                                                                |
|--------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------|
| Input [5]                                                          | <b>0 pF</b>     | Input ..... 500000005 0005300 0000005060 0φ0<br>81 pF                                           |
| Input [6]                                                          | <b>81 pF</b>    | Input ..... 500000005 0005300 0000005060 0φ0<br>81 pF                                           |
| Direct Interelectrode Capacitances (grounded grid and screen)      | <b>2</b>        | Direct Interelectrode Capacitances (grounded grid and screen)2                                  |
| RADIO FREQUENCY LINEAR AMPLIFIER TYPICAL OPERATION (Frequencies to | <b>30 MHz</b>   | RADIO FREQUENCY LINEAR AMPLIFIER TYPICAL OPERATION (Frequencies to 30 MHz)                      |
| Plate Voltage [1]                                                  | <b>2000</b>     | Plate Voltage . . . . . 2000 2500 3000 Vdc                                                      |
| Plate Voltage [2]                                                  | <b>2500</b>     | Plate Voltage . . . . . 2000 2500 3000 Vdc                                                      |
| Plate Voltage [3]                                                  | <b>3000</b>     | Plate Voltage . . . . . 2000 2500 3000 Vdc                                                      |
| Grid Voltage! . . ., [1]                                           | <b>-60</b>      | Grid Voltage! . . ., . . . . -60 -60 -60 Vdc                                                    |
| Grid Voltage! . . ., [2]                                           | <b>-60</b>      | Grid Voltage! . . ., . . . . -60 -60 -60 Vdc                                                    |
| Grid Voltage! . . ., [3]                                           | <b>-60</b>      | Grid Voltage! . . ., . . . . -60 -60 -60 Vdc                                                    |
| DCPLATEVOLTAGE .« v v v v vt v e v [1]                             | <b>3000 V</b>   | DCPLATEVOLTAGE .« v v v v vt v e v 3000 VOLTS Zero-Signal Plate Current . . 358 250 5758) mZ«dc |
| DCPLATEVOLTAGE .« v v v v vt v e v [2]                             | <b>358 V</b>    | DCPLATEVOLTAGE .« v v v v vt v e v 3000 VOLTS Zero-Signal Plate Current . . 358 250 5758) mZ«dc |
| DCPLATEVOLTAGE .« v v v v vt v e v [3]                             | <b>250 V</b>    | DCPLATEVOLTAGE .« v v v v vt v e v 3000 VOLTS Zero-Signal Plate Current . . 358 250 5758) mZ«dc |
| DCPLATEVOLTAGE .« v v v v vt v e v [4]                             | <b>5758 V</b>   | DCPLATEVOLTAGE .« v v v v vt v e v 3000 VOLTS Zero-Signal Plate Current . . 358 250 5758) mZ«dc |
| _____ [1]                                                          | <b>400</b>      | _____ 400 L Single Tone Plate Current . . . 890 885 mAdc                                        |
| _____ [2]                                                          | <b>890</b>      | _____ 400 L Single Tone Plate Current . . . 890 885 mAdc                                        |
| _____ [3]                                                          | <b>885</b>      | _____ 400 L Single Tone Plate Current . . . 890 885 mAdc                                        |
| gg \$LC\$EEN VO;;S.SE [1]                                          | <b>1</b>        | gg \$LC\$EEN VO;;S.SE 1.0 XI\OAPE:E Two-Tone Plate Current . . . 645 650 635 mAdc               |
| gg \$LC\$EEN VO;;S.SE [2]                                          | <b>645</b>      | gg \$LC\$EEN VO;;S.SE 1.0 XI\OAPE:E Two-Tone Plate Current . . . 645 650 635 mAdc               |
| gg \$LC\$EEN VO;;S.SE [3]                                          | <b>650</b>      | gg \$LC\$EEN VO;;S.SE 1.0 XI\OAPE:E Two-Tone Plate Current . . . 645 650 635 mAdc               |

| PARAMETER                                                | PUBLISHED VALUE | CONDITION / NOTE                                                                          |
|----------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|
| gg \$LC\$EEN VO;;S.SE [4]                                | <b>635</b>      | gg \$LC\$EEN VO;;S.SE 1.0 XI\OAPE:E Two-Tone Plate Current . ... 645 650 635 mAdc         |
| TECURRENT ... .vvvveens . Zero-Signa! Screen Current [1] | <b>8</b>        | TECURRENT ... .vvvveens . Zero-Signa! Screen Current . . 8 6 5 mAdc                       |
| TECURRENT ... .vvvveens . Zero-Signa! Screen Current [2] | <b>6</b>        | TECURRENT ... .vvvveens . Zero-Signa! Screen Current . . 8 6 5 mAdc                       |
| TECURRENT ... .vvvveens . Zero-Signa! Screen Current [3] | <b>5</b>        | TECURRENT ... .vvvveens . Zero-Signa! Screen Current . . 8 6 5 mAdc                       |
| PLATE DISSIPATION ... ..... « [1]                        | <b>1000 W</b>   | PLATE DISSIPATION ... ..... «... 1000 WATTS Single-Tone Screen Current2. . 35 35 35 mAdc  |
| PLATE DISSIPATION ... ..... « [2]                        | <b>35 W</b>     | PLATE DISSIPATION ... ..... «... 1000 WATTS Single-Tone Screen Current2. . 35 35 35 mAdc  |
| PLATE DISSIPATION ... ..... « [3]                        | <b>35 W</b>     | PLATE DISSIPATION ... ..... «... 1000 WATTS Single-Tone Screen Current2. . 35 35 35 mAdc  |
| PLATE DISSIPATION ... ..... « [4]                        | <b>35 W</b>     | PLATE DISSIPATION ... ..... «... 1000 WATTS Single-Tone Screen Current2. . 35 35 35 mAdc  |
| SCREEN DISSIPATION . . . v v v v vt v v v [1]            | <b>12 W</b>     | SCREEN DISSIPATION . . . v v v v vt v v v 12 WATTS Two-Tone Screen Currentz P 10 8 8 mAdc |
| SCREEN DISSIPATION . . . v v v v vt v v v [2]            | <b>10 W</b>     | SCREEN DISSIPATION . . . v v v v vt v v v 12 WATTS Two-Tone Screen Currentz P 10 8 8 mAdc |
| SCREEN DISSIPATION . . . v v v v vt v v v [3]            | <b>8 W</b>      | SCREEN DISSIPATION . . . v v v v vt v v v 12 WATTS Two-Tone Screen Currentz P 10 8 8 mAdc |
| SCREEN DISSIPATION . . . v v v v vt v v v [4]            | <b>8 W</b>      | SCREEN DISSIPATION . . . v v v v vt v v v 12 WATTS Two-Tone Screen Currentz P 10 8 8 mAdc |
| e [1]                                                    | <b>0 W</b>      | e 0 WATT Plate Output Power . ... 930 1300 1630 w                                         |
| e [2]                                                    | <b>930 W</b>    | e 0 WATT Plate Output Power . ... 930 1300 1630 w                                         |
| e [3]                                                    | <b>1300 W</b>   | e 0 WATT Plate Output Power . ... 930 1300 1630 w                                         |
| e [4]                                                    | <b>1630 W</b>   | e 0 WATT Plate Output Power . ... 930 1300 1630 w                                         |
| Published value                                          | <b>1</b>        | 1. Adjust to specified zero-signal dc plate current.                                      |
|                                                          |                 |                                                                                           |

| PARAMETER                                                  | PUBLISHED VALUE | CONDITION / NOTE                                                                        |
|------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------|
| Plate Voltage [1]                                          | <b>2000</b>     | . . . . Plate Voltage . . . . . 2000 2500 3000 Vdc                                      |
| Plate Voltage [2]                                          | <b>2500</b>     | . . . . Plate Voltage . . . . . 2000 2500 3000 Vdc                                      |
| Plate Voltage [3]                                          | <b>3000</b>     | . . . . Plate Voltage . . . . . 2000 2500 3000 Vdc                                      |
| Class AB1. Grid Driven(Sinusoidal Wave) Screen Voltage [1] | <b>325</b>      | Class AB1. Grid Driven(Sinusoidal Wave) Screen Voltage . . . . . 325 325 325 Vds        |
| Class AB1. Grid Driven(Sinusoidal Wave) Screen Voltage [2] | <b>325</b>      | Class AB1. Grid Driven(Sinusoidal Wave) Screen Voltage . . . . . 325 325 325 Vds        |
| Class AB1. Grid Driven(Sinusoidal Wave) Screen Voltage [3] | <b>325</b>      | Class AB1. Grid Driven(Sinusoidal Wave) Screen Voltage . . . . . 325 325 325 Vds        |
| Grid Voltage [1]                                           | <b>1.2</b>      | Grid Voltage 1.2, . . . . . -0 -60 -60 Vdc                                              |
| Grid Voltage [2]                                           | <b>0</b>        | Grid Voltage 1.2, . . . . . -0 -60 -60 Vdc                                              |
| Grid Voltage [3]                                           | <b>-60</b>      | Grid Voltage 1.2, . . . . . -0 -60 -60 Vdc                                              |
| Grid Voltage [4]                                           | <b>-60</b>      | Grid Voltage 1.2, . . . . . -0 -60 -60 Vdc                                              |
| MAXIMUM RATINGS (Per Tube) Zero-Signal Plate Current [1]   | <b>500</b>      | MAXIMUM RATINGS (Per Tube) Zero-Signal Plate Current .. 500 500 500 mAdc                |
| MAXIMUM RATINGS (Per Tube) Zero-Signal Plate Current [2]   | <b>500</b>      | MAXIMUM RATINGS (Per Tube) Zero-Signal Plate Current .. 500 500 500 mAdc                |
| MAXIMUM RATINGS (Per Tube) Zero-Signal Plate Current [3]   | <b>500</b>      | MAXIMUM RATINGS (Per Tube) Zero-Signal Plate Current .. 500 500 500 mAdc                |
| Max Signal Plate Current [1]                               | <b>1.78</b>     | Max Signal Plate Current.. 1.78 1.77 1.76 Adc                                           |
| Max Signal Plate Current [2]                               | <b>1.77</b>     | Max Signal Plate Current.. 1.78 1.77 1.76 Adc                                           |
| Max Signal Plate Current [3]                               | <b>1.76</b>     | Max Signal Plate Current.. 1.78 1.77 1.76 Adc                                           |
| DC PLATE VOLTAGE . . . . . e                               | <b>3000 V</b>   | DC PLATE VOLTAGE . . . . . e 3000 VOLTS Zero-Signal                                     |
| Signal Screen Currentl                                     | <b>16</b>       | Signal Screen Currentl. .. 16                                                           |
| DC SCREEN VOLTAGE . . . . . «+ [1]                         | <b>400 V</b>    | DC SCREEN VOLTAGE . . . . . «+.. 400 VOLTS Plate Output Power. . . . . 1860 2600 3260 W |
| DC SCREEN VOLTAGE . . . . . «+ [2]                         | <b>1860 V</b>   | DC SCREEN VOLTAGE . . . . . «+.. 400 VOLTS Plate Output Power. . . . . 1860 2600 3260 W |
| DC SCREEN VOLTAGE . . . . . «+ [3]                         | <b>2600 V</b>   | DC SCREEN VOLTAGE . . . . . «+.. 400 VOLTS Plate Output Power. . . . . 1860 2600 3260 W |
| DC SCREEN VOLTAGE . . . . . «+ [4]                         | <b>3260 V</b>   | DC SCREEN VOLTAGE . . . . . «+.. 400 VOLTS Plate Output Power. . . . . 1860 2600 3260 W |

| PARAMETER                                                                       | PUBLISHED VALUE | CONDITION / NOTE                                                                                          |
|---------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------|
| DCPLATECURRENT ..o v v vn v<br>e v v v v                                        | <b>1 A</b>      | DCPLATECURRENT ..o v v vn v e v v v v 1.0<br>AMPERE Load Resistance                                       |
| PLATE DISSIPATION .. ... v v<br>i v v v n [1]                                   | <b>1000 W</b>   | PLATE DISSIPATION .. ... v v i v v v n 1000<br>WATTS (plate to plate) . ..... 2040 2850 3860 Q            |
| PLATE DISSIPATION .. ... v v<br>i v v v n [2]                                   | <b>2040 W</b>   | PLATE DISSIPATION .. ... v v i v v v n 1000<br>WATTS (plate to plate) . ..... 2040 2850 3860 Q            |
| PLATE DISSIPATION .. ... v v<br>i v v v n [3]                                   | <b>2850 W</b>   | PLATE DISSIPATION .. ... v v i v v v n 1000<br>WATTS (plate to plate) . ..... 2040 2850 3860 Q            |
| PLATE DISSIPATION .. ... v v<br>i v v v n [4]                                   | <b>3860 W</b>   | PLATE DISSIPATION .. ... v v i v v v n 1000<br>WATTS (plate to plate) . ..... 2040 2850 3860 Q            |
| SCREEN DISSIPATION [1]                                                          | <b>12 W</b>     | SCREEN DISSIPATION ... ... 12 WATTS 1.<br>Approximate value.                                              |
| SCREEN DISSIPATION [2]                                                          | <b>1 W</b>      | SCREEN DISSIPATION ... ... 12 WATTS 1.<br>Approximate value.                                              |
| GRID DISSIPATION . . . v v v<br>v vt et v s [1]                                 | <b>0 W</b>      | GRID DISSIPATION . . . v v v v vt et v s 0 WATT<br>2. Adjust to give stated zero-signal plate<br>current. |
| GRID DISSIPATION . . . v v v<br>v vt et v s [2]                                 | <b>2 W</b>      | GRID DISSIPATION . . . v v v v vt et v s 0 WATT<br>2. Adjust to give stated zero-signal plate<br>current. |
| Heater: Current at6 [1]                                                         | <b>0 V</b>      | Heater: Current at6.0 volts . . ... v v v v v vt .....<br>e 8.1 9.9                                       |
| Heater: Current at6 [2]                                                         | <b>8.1 V</b>    | Heater: Current at6.0 volts . . ... v v v v v vt .....<br>e 8.1 9.9                                       |
| Heater: Current at6 [3]                                                         | <b>9.9 V</b>    | Heater: Current at6.0 volts . . ... v v v v v vt .....<br>e 8.1 9.9                                       |
| Input ..... e e [1]                                                             | <b>75 pF</b>    | Input ..... e e . 75 88 pF                                                                                |
| Input ..... e e [2]                                                             | <b>88 pF</b>    | Input ..... e e . 75 88 pF                                                                                |
| dissipation at sea level and<br>with inlet air tem- tion<br>double amplitude is | <b>25</b>       | dissipation at sea level and with inlet air tem-<br>tion double amplitude is .25 inch.                    |
| difference across the tube<br>and socket of                                     | <b>0.2</b>      | difference across the tube and socket of 0.2<br>within specification for grid bias voltage and            |
| At higher altitudes and at<br>VHF increased air [1]                             | <b>4 V</b>      | At higher altitudes and at VHF increased air<br>4CX1000A is 6.0 volts. The voltage, as<br>measured        |
| At higher altitudes and at<br>VHF increased air [2]                             | <b>0 V</b>      | At higher altitudes and at VHF increased air<br>4CX1000A is 6.0 volts. The voltage, as<br>measured        |
|                                                                                 |                 |                                                                                                           |

| PARAMETER                                                                         | PUBLISHED VALUE | CONDITION / NOTE                                                                                 |
|-----------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------|
| At higher altitudes and at VHF increased air [3]                                  | <b>6 V</b>      | At higher altitudes and at VHF increased air 4CX1000A is 6.0 volts. The voltage, as measured     |
| drop across tube and socket of [1]                                                | <b>0.3</b>      | drop across tube and socket of 0.3 inch of water voltage be allowed to exceed 5% above the rated |
| drop across tube and socket of [2]                                                | <b>5</b>        | drop across tube and socket of 0.3 inch of water voltage be allowed to exceed 5% above the rated |
| lesser degree depending on individual tube de- bleeder current should approximate | <b>70</b>       | lesser degree depending on individual tube de- bleeder current should approximate 70 milliam-    |
| Published value [1]                                                               | <b>4</b>        | 4CX1000A and, under some operating condi- It should be observed that this bleeder power          |
| Published value [2]                                                               | <b>0</b>        | 4CX1000A and, under some operating condi- It should be observed that this bleeder power          |
| The product of the peak screen voltage and the dissipation power is               | <b>1000 W</b>   | The product of the peak screen voltage and the dissipation power is 1000 watts, Except for       |
| Published value [1]                                                               | <b>50 V</b>     | 50 SCREEN VOLTAGE — 325 VOLTS                                                                    |
| Published value [2]                                                               | <b>325 V</b>    | 50 SCREEN VOLTAGE — 325 VOLTS                                                                    |

## TUBE TINKER

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