



**SUBMINIATURE VOLTAGE AMPLIFIER PENTODE**

**DESCRIPTION**

The CK512AX is a filament type subminiature pentode designed primarily for use in resistance coupled audio frequency and direct coupled amplifiers. Typical applications are hearing aids and other wearable or portable instruments. The tube features low battery drain, long life, small size and low microphonic level. The tinned flexible leads may be soldered or welded directly to circuit components without the use of sockets. Standard subminiature sockets may be used by cutting the leads to 0.20" length. The suppressor grid consists of two beam-forming detector plates.

**MECHANICAL DATA**

ENVELOPE: T-2X3 Glass

BASE: 0.016" tinned flexible leads with a length of 1.5" minimum and a center-to-center spacing of 0.05".

TERMINAL CONNECTIONS: (Red dot is adjacent to Lead 1)

- Lead 1 Plate
- Lead 2 Grid #2
- Lead 3 Filament, positive
- Lead 4 Grid #1
- Lead 5 Filament, negative

MOUNTING POSITION: Any

WEIGHT: 0.07 ounces

**ELECTRICAL DATA**

DIRECT INTERELECTRODE CAPACITANCES: (uufds.) \*

|               |       |
|---------------|-------|
| Grid to Plate | 0.045 |
| Input         | 2.0   |
| Output        | 1.5   |

RATINGS:

|                                   |             |
|-----------------------------------|-------------|
| Filament Voltage                  | 0.625 volts |
| Absolute Maximum Filament Voltage | 0.78 volts  |
| Maximum Plate Voltage             | 45 volts    |
| Maximum Grid #2 Voltage           | 45 volts    |

AVERAGE CHARACTERISTICS:

|                  |              |
|------------------|--------------|
| Filament Voltage | 0.625 volts  |
| Filament Current | 20 ma.       |
| Plate Voltage    | 22.5 volts   |
| Grid #2 Voltage  | 22.5 volts   |
| Grid #1 Voltage  | -0.625 volts |
| Plate Current    | 125 ua.      |
| Grid #2 Current  | 40 ua.       |
| Transconductance | 160 umhos    |
| Plate Resistance | 1.25 megohms |

TYPICAL OPERATION IN RESISTANCE COUPLED AUDIO FREQUENCY AMPLIFIER:

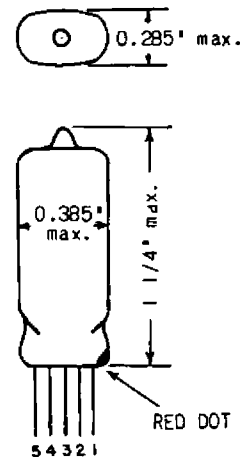
|                                   | First Stage |       | Second Stage |              |
|-----------------------------------|-------------|-------|--------------|--------------|
| Filament Voltage                  | 0.625       | 0.625 | 0.625        | 0.625 volts  |
| Plate & Grid #2 Supply Voltage    | 15          | 22.5  | 15           | 22.5 volts   |
| Grid #1 Voltage **                | 0           | 0     | -0.625       | -0.625 volts |
| Plate Resistor †                  | 1.0         | 1.0   | 1.0          | 1.0 megohms  |
| Grid #2 Resistor †                | 2.2         | 2.7   | 1.0          | 1.5 megohms  |
| Average Voltage Gain (G1 to P) †† | 26:1        | 37:1  | 22:1         | 33:1         |
| Approx. Voltage Gain (G2 to P)    | 3:1         | 4:1   | 3:1          | 4:1          |

\* Measured without shielding of bulb.

\*\* Control grid should be returned through approximately 5 to 22 megohms to negative filament or bias voltage.

† Other plate and grid #2 resistor values may be used to obtain less variation in voltage gain between tubes at the possible expense of less average gain.

†† The values of voltage gain are quoted for a coupled load of 5 megohms, zero source impedance, and a 5 megohm grid resistor. The reactive impedances (C<sub>in</sub>, C<sub>out</sub>, C<sub>g1</sub>, C<sub>g2</sub>, C<sub>L</sub>) are of such values that they have negligible effect upon the gain. See CS-2472-12 on page 4.

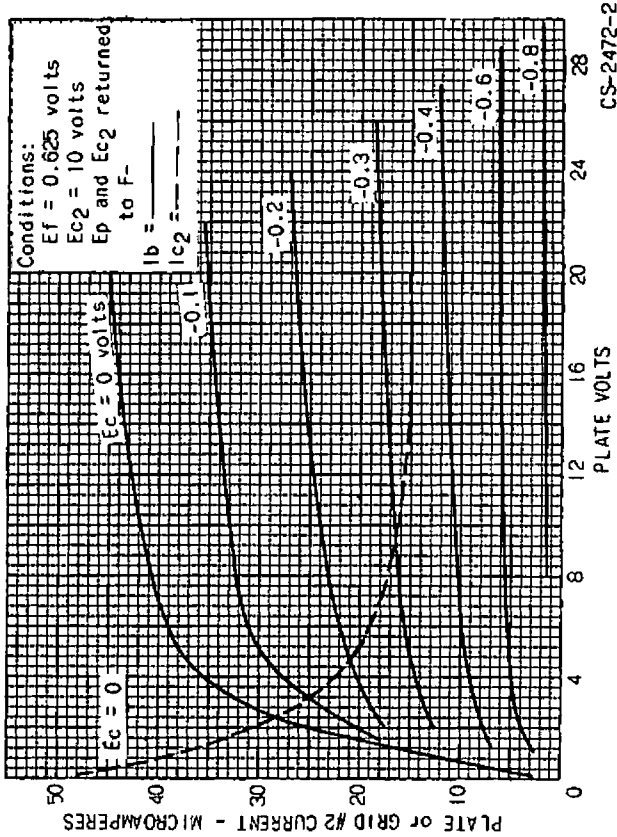


VIEW FACING TYPE NUMBER

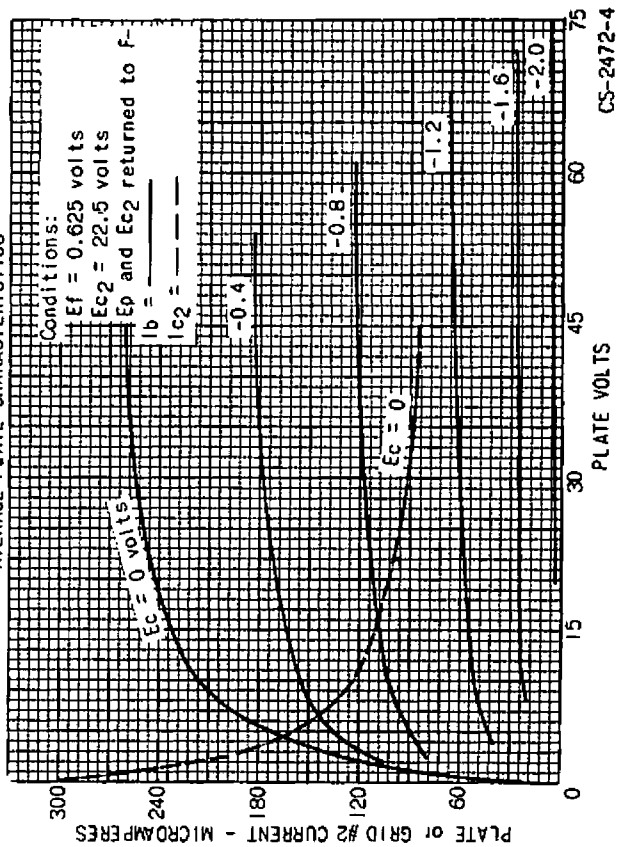


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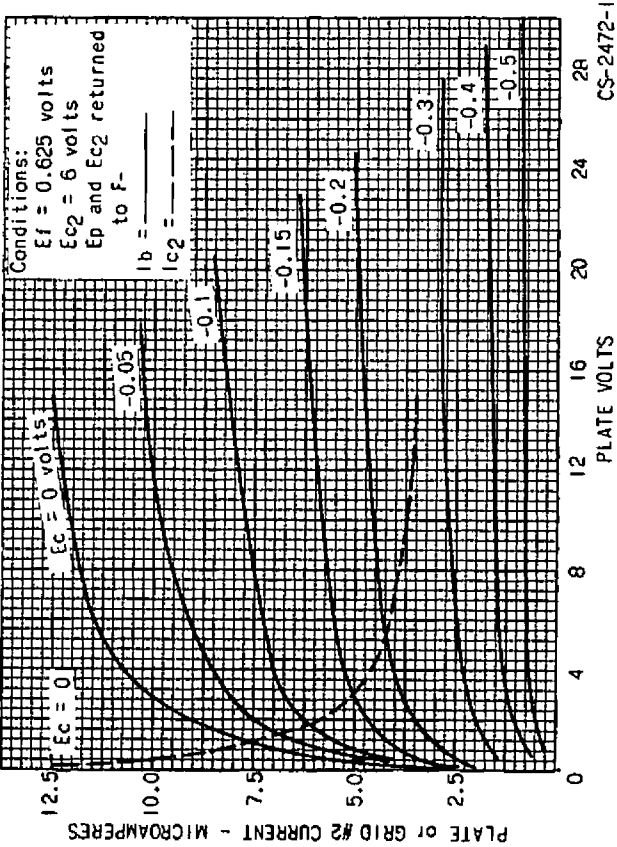
AVERAGE PLATE CHARACTERISTICS



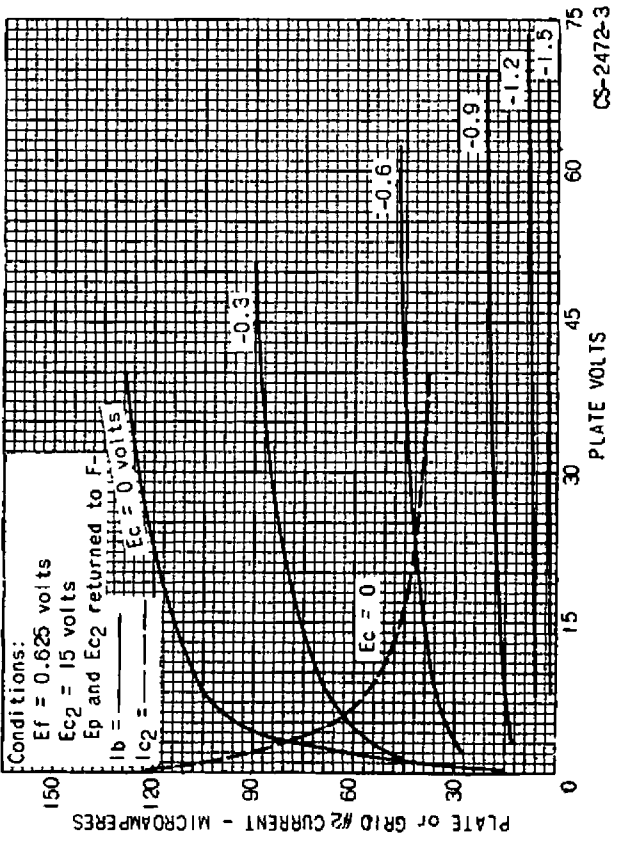
AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS

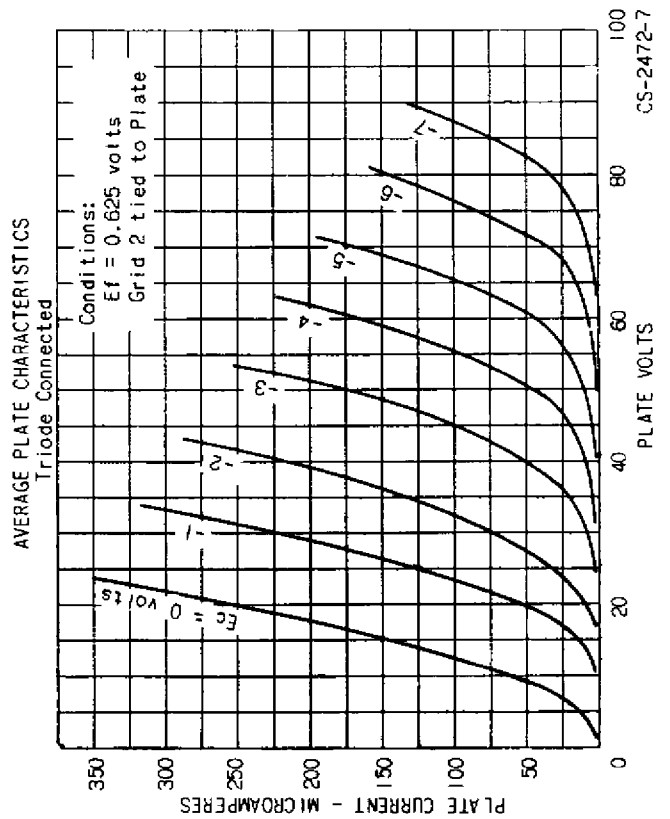
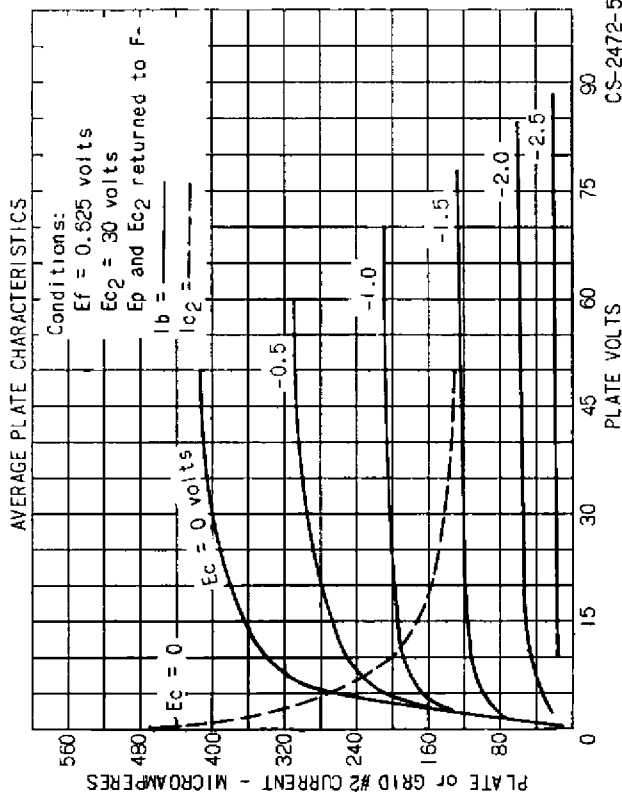
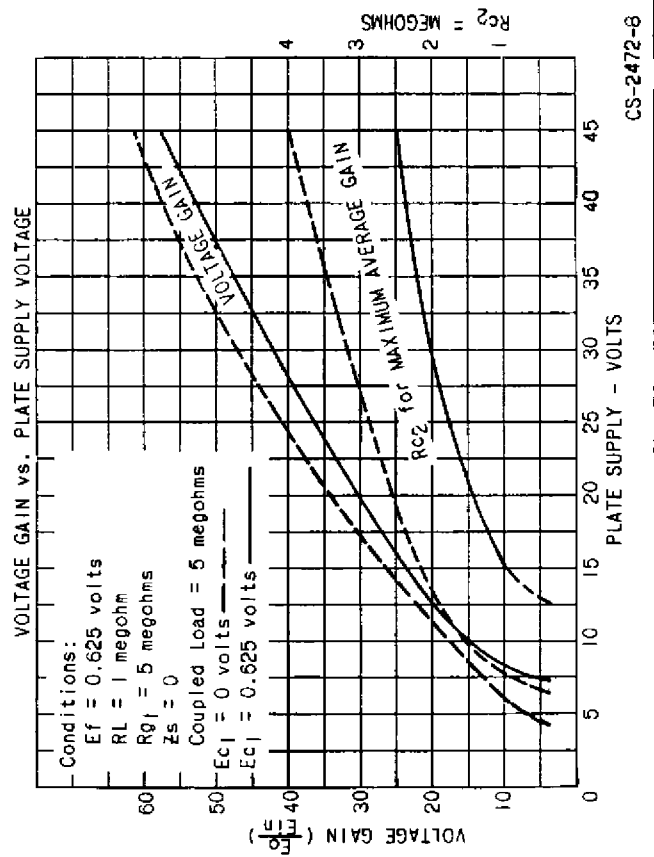
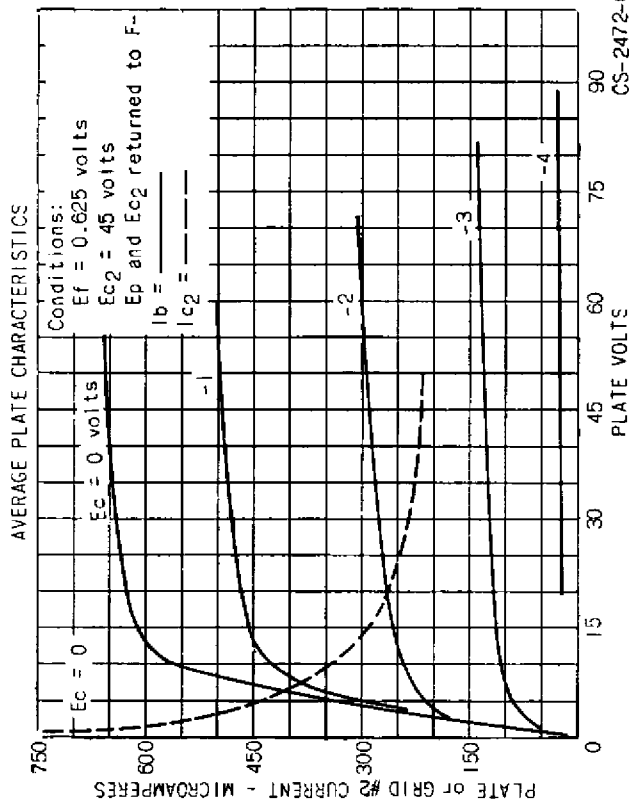


AVERAGE PLATE CHARACTERISTICS



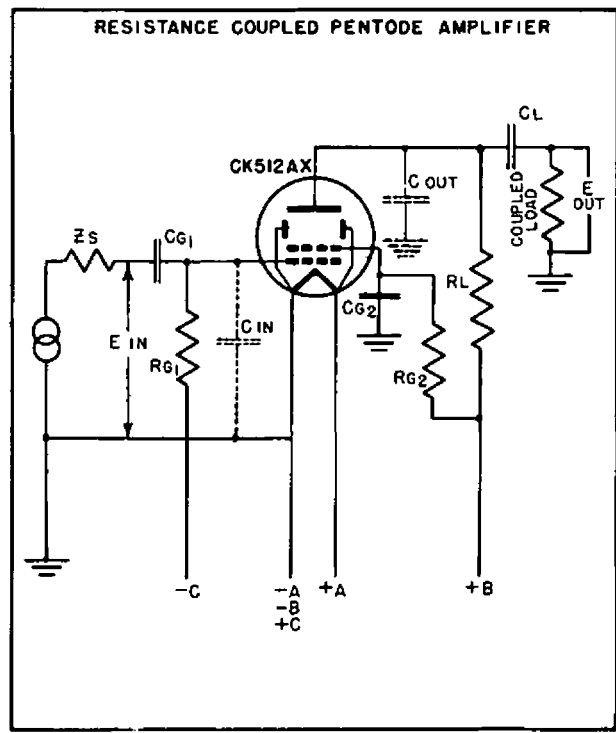
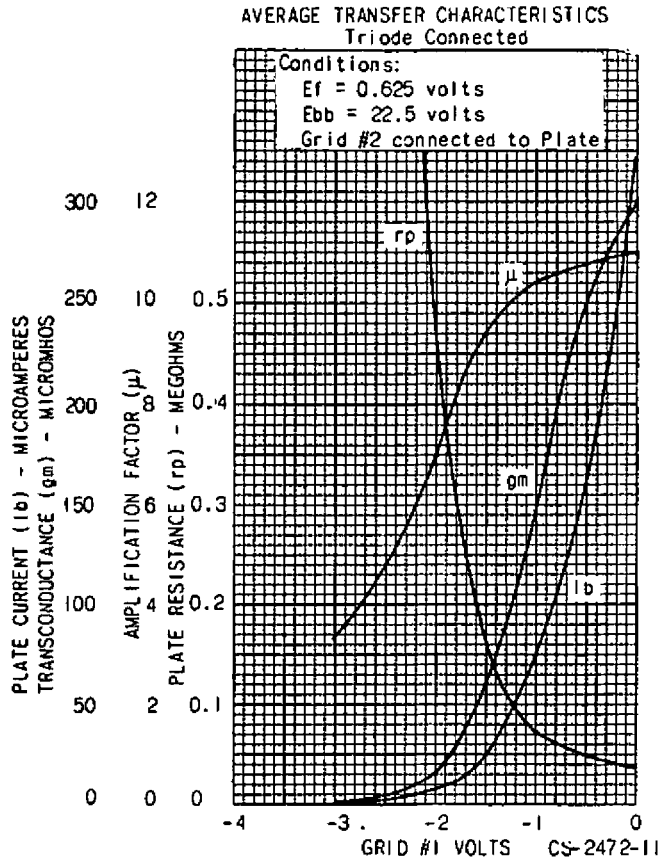
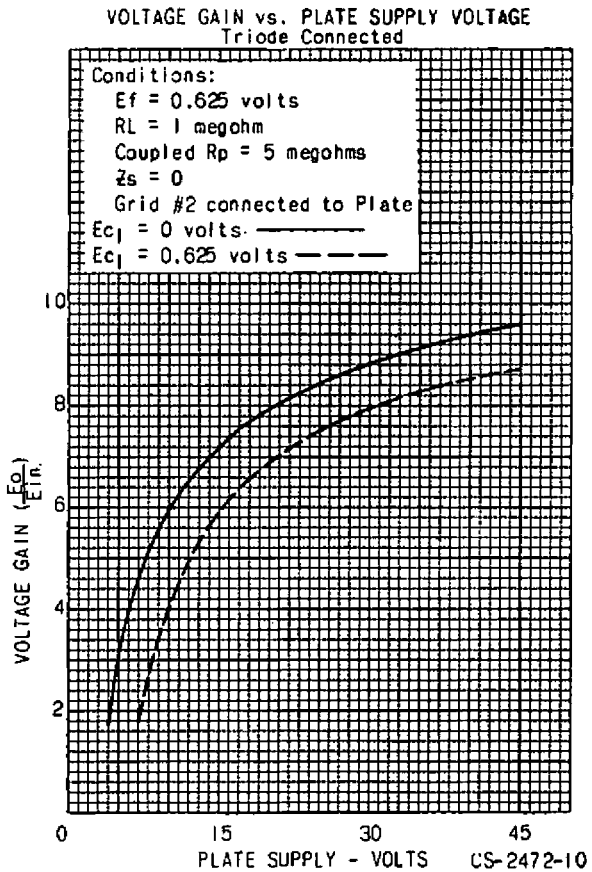
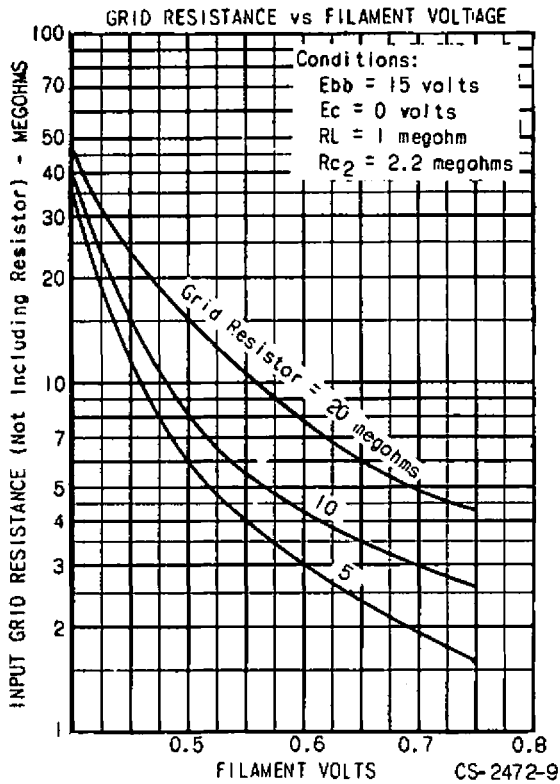


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CS-2472-12

Raytheon Subminiature tubes are made under one or more of the following United States patents owned by Raytheon: 1,963,008; 2,330,838; 2,366,220; 2,376,397; 2,406,422; 2,413,338; 2,266,080; 2,355,083; 2,358,829; 2,366,756; 2,402,797; 2,467,390.