

12AX7

TWIN TRIODE

DESCRIPTION AND RATING

The 12AX7 is a miniature high-mu twin triode each section of which has an individual cathode connection. The 12AX7 is especially suited for use in resistance-coupled voltage amplifiers, phase inverters, multivibrators, and numerous industrial-control circuits where high voltage gain is desired. A center-tapped heater permits operation of the tube from either a 6.3-volt or a 12.6-volt heater supply.

GENERAL

Cathode—Coated Unipotential

| | Series | Parallel |
|------------------------------------|--------|-------------|
| Heater Voltage, AC or DC | 12.6 | 6.3 Volts |
| Heater Current | 0.15 | 0.3 Amperes |
| Envelope—T-6½, Glass | | |
| Base—E9-1, Small Button 9-Pin | | |
| Mounting Position—Any | | |

Direct Interelectrode Capacitances

| | With Shield* | Without Shield |
|---------------------------------------|--------------|-----------------------|
| Grid to Plate, Each Section | 1.7 | 1.7 $\mu\mu\text{f}$ |
| Input, Each Section | 1.8 | 1.6 $\mu\mu\text{f}$ |
| Output, Section 1 | 1.9 | 0.46 $\mu\mu\text{f}$ |
| Output, Section 2 | 1.9 | 0.34 $\mu\mu\text{f}$ |

MAXIMUM RATINGS

DESIGN-CENTER VALUES, EACH SECTION

| | |
|---|-----------|
| Plate Voltage | 300 Volts |
| Positive DC Grid Voltage | 0 Volts |
| Negative DC Grid Voltage | 50 Volts |
| Plate Dissipation | 1.0 Watts |
| Heater-Cathode Voltage | |
| Heater Positive with Respect to Cathode | 180 Volts |
| Heater Negative with Respect to Cathode | 180 Volts |

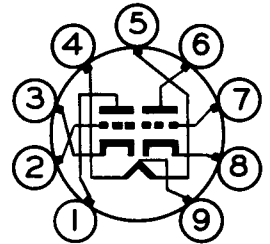
CHARACTERISTICS AND TYPICAL OPERATION

CLASS A₁ AMPLIFIER, EACH SECTION

| | | |
|---|-------|-----------------|
| Plate Voltage | 100 | 250 Volts |
| Grid Voltage | -1 | -2 Volts |
| Amplification Factor | 100 | 100 |
| Plate Resistance, approximate | 80000 | 62500 Ohms |
| Transconductance | 1250 | 1600 Micromhos |
| Plate Current | 0.5 | 1.2 Milliampers |

* With external shield (RETMA 315) connected to cathode of section under test.

BASING DIAGRAM

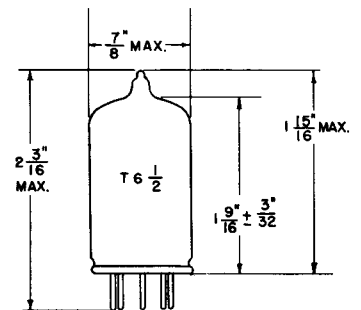


RETMA 9A
BOTTOM VIEW

TERMINAL CONNECTIONS

- Pin 1—Plate (Section 2)
- Pin 2—Grid (Section 2)
- Pin 3—Cathode (Section 2)
- Pin 4—Heater
- Pin 5—Heater
- Pin 6—Plate (Section 1)
- Pin 7—Grid (Section 1)
- Pin 8—Cathode (Section 1)
- Pin 9—Heater Center-Tap

PHYSICAL DIMENSIONS

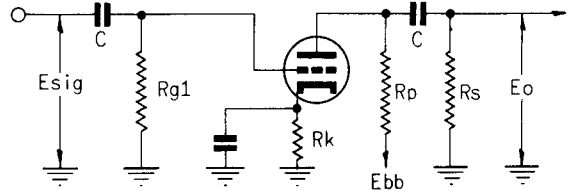


RETMA 6-2

CLASS A RESISTANCE-COUPLED AMPLIFIER

EACH SECTION

| Rp Meg. | Rs Meg. | Rg1 Meg. | Ebb = 90 Volts | | | Ebb = 180 Volts | | | Ebb = 300 Volts | | |
|------------|------------|-------------|----------------|------|-----|-----------------|------|----|-----------------|------|----|
| | | | Rk | Gain | Eo | Rk | Gain | Eo | Rk | Gain | Eo |
| 0.10 | 0.10 | 0.1 | 1700 | 31 | 5.0 | 1000 | 40 | 15 | 760 | 43 | 30 |
| 0.10 | 0.24 | 0.1 | 2000 | 38 | 6.9 | 1100 | 46 | 20 | 900 | 50 | 40 |
| 0.24 | 0.24 | 0.1 | 3500 | 43 | 6.5 | 2000 | 54 | 18 | 1600 | 58 | 37 |
| 0.24 | 0.51 | 0.1 | 3900 | 49 | 8.6 | 2300 | 59 | 24 | 1800 | 64 | 47 |
| 0.51 | 0.51 | 0.1 | 7100 | 50 | 7.4 | 4300 | 62 | 19 | 3100 | 66 | 39 |
| 0.51 | 1.0 | 0.1 | 7800 | 53 | 9.1 | 4800 | 64 | 24 | 3600 | 69 | 46 |
| 0.24 | 0.24 | 10 | 0 | 37 | 3.9 | 0 | 53 | 15 | 0 | 62 | 32 |
| 0.24 | 0.51 | 10 | 0 | 44 | 5.4 | 0 | 60 | 19 | 0 | 67 | 41 |
| 0.51 | 0.51 | 10 | 0 | 44 | 5.0 | 0 | 61 | 17 | 0 | 69 | 35 |
| 0.51 | 1.0 | 10 | 0 | 49 | 6.4 | 0 | 66 | 21 | 0 | 71 | 41 |

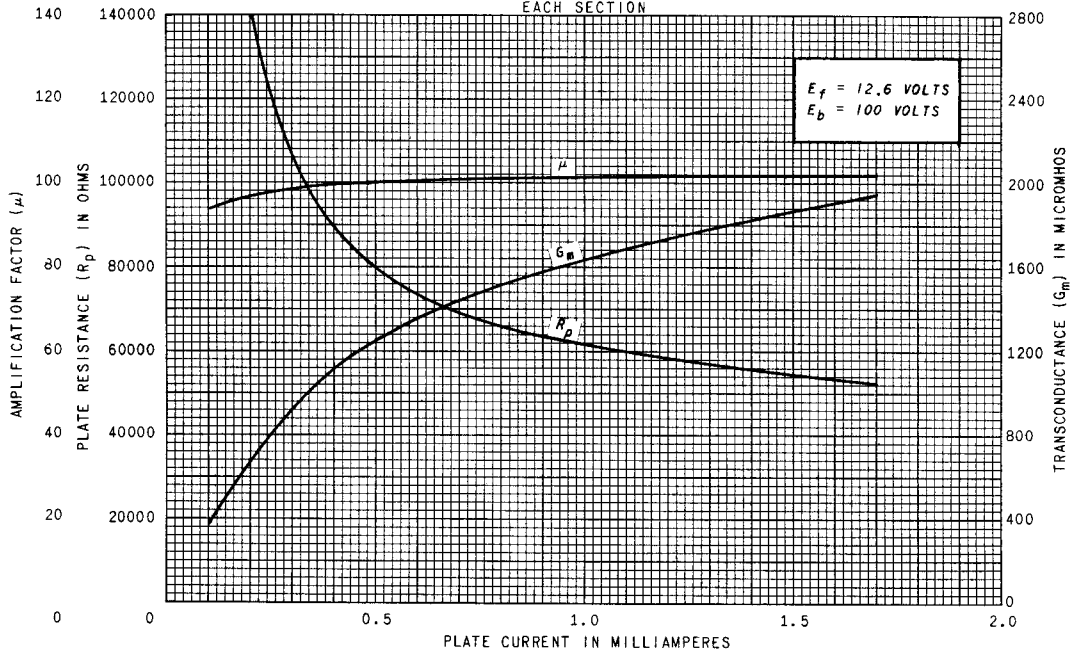


Note: Coupling capacitors (C) should be selected to give desired frequency response. Rk should be adequately by-passed.

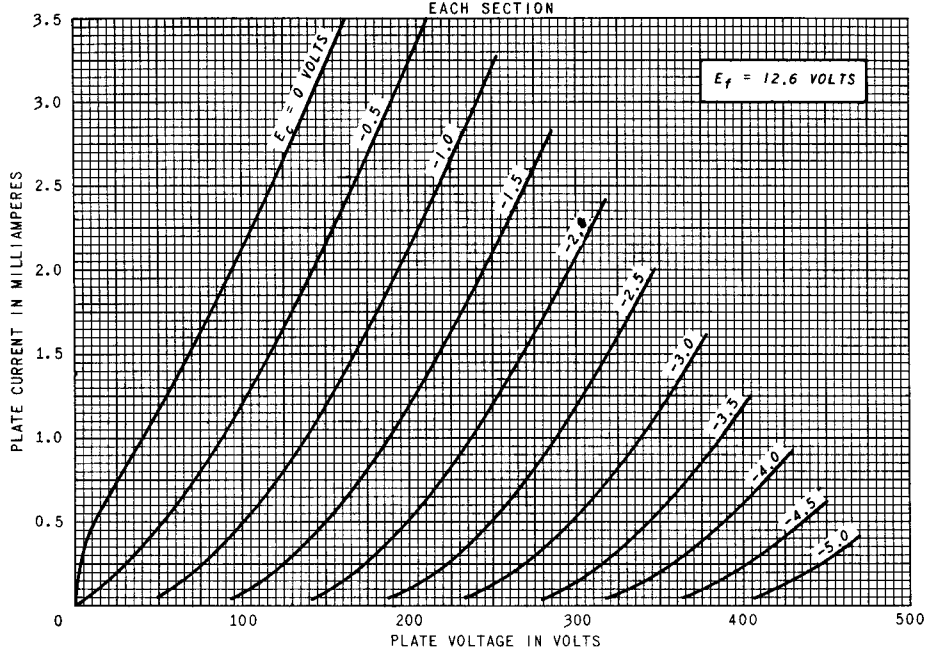
Notes: 1. Eo is maximum RMS voltage output for five percent (5%) total harmonic distortion. 2. Gain measured at 2.0 volts RMS output. 3. For zero-bias data, generator impedance is negligible.

AVERAGE CHARACTERISTICS

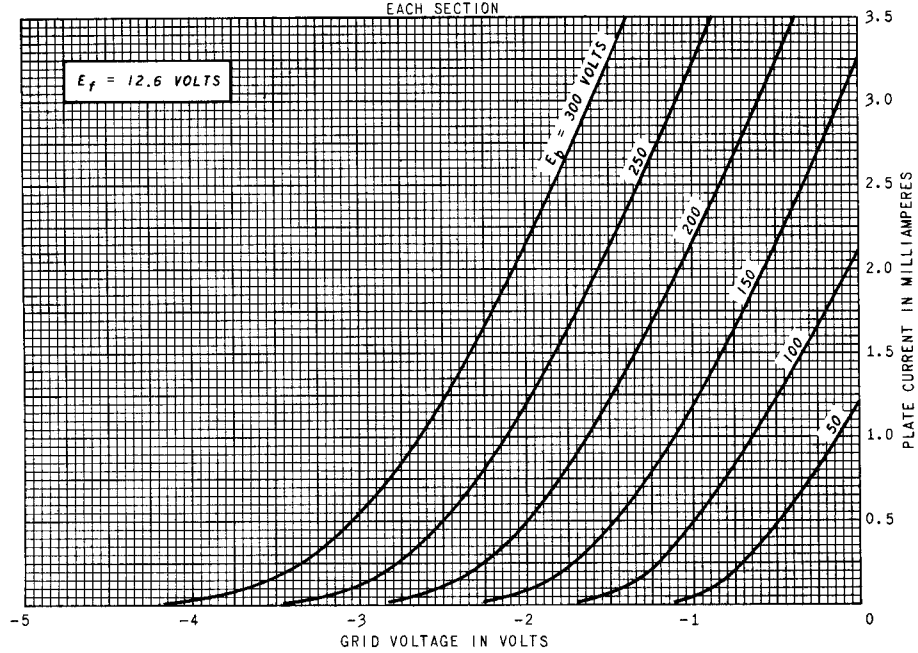
EACH SECTION



AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS



AVERAGE CHARACTERISTICS
 EACH SECTION

