

Medium-Mu Triode— Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For High-Fidelity Audio-Amplifier Applications Critical as to Noise and Hum

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.450	amp
Peak heater-cathode voltage (Each Unit):		

Heater negative with respect to cathode.	200	max.	volts
--	-----	------	-------

Heater positive with respect to cathode.	200 ^a	max.	volts
--	------------------	------	-------

Direct Interelectrode Capacitances:^b

Triode Unit:

Grid to plate	2	pf
Grid to cathode and heater.	2.3	pf
Plate to cathode and heater	0.3	pf

Pentode Unit:

Grid No.1 to plate.	0.06	max.	pf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater.	5		pf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater.	2		pf

Equivalent-Hum and Noise Voltage (Referenced to Grid):

Triode Unit

Average Value (RMS)	10	microvolts
Maximum Value (RMS)	50	microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate load resistor (megohms) = 0.1, cathode resistor (ohms) unbypassed = 1500, grid resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

Pentode Unit

Average Value (RMS)	15	microvolts
Maximum Value (RMS)	35	microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate-load resistor (megohms) = 0.22, grid-No.2 supply volts = 250; grid No.2 voltage divider: resistor (megohm) from grid No.2 to B+ = 0.68, resistor (megohm) from grid-No.2 to ground = 0.33; bypass ca-

← Indicates a change.



pacitor (μf) from grid No.2 to cathode = 0.1; cathode resistor (ohms unbypassed) = 680; grid No.1 resistor (megohm) = 0.27; and amplifier covering frequency range between 25 and 10,000 cps.

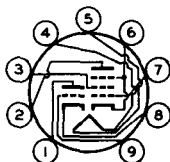
Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage.	215	100 220	volts
Grid-No.2 Supply Voltage.	—	50 130	volts
Grid-No.1 Voltage.	-8.5	—	volts
Cathode Resistor.	—	1000 62	ohms
Amplification Factor.	17	—	—
Plate Resistance (Approx.).	0.0081	1 0.4	megohm
Transconductance.	2100	1500 7000	μmhos
Plate Current.	9	1.1 12.5	ma
Grid-No.2 Current.	—	0.35 3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-40	-4 —	volts

Mechanical:

Operating Position.	Any
Type of Cathodes.	Coated Unipotential
Maximum Overall Length.	2-3/16"
Maximum Seated Length.	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip).	1-9/16" $\pm$ 3/32"
Diameter.	0.750" to 0.875"
Dimensional Outline.	See General Section
Bulb.	T6-1/2
Base.	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW.	9JT

Pin 1—Triode
Plate
Pin 2—Pentode
Plate
Pin 3—Pentode
Grid No.2
Pin 4—Heater
Pin 5—Heater



Pin 6—Pentode
Cathode,
Grid No.3,
Internal
Shield
Pin 7—Pentode
Grid No.1
Pin 8—Triode
Cathode
Pin 9—Triode
Grid

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE.	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE.	—	330 max.	volts
GRID-No.2 VOLTAGE.	—	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value.	0 max.	0 max.	volts

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
GRID-NO.2 INPUT:			
For grid-No.2 voltages up to 165 volts	-	0.6 max.	watt
For grid-No.2 voltages between 165 and 330 volts	-	See <i>Grid-No.2 Input Rating Chart</i> at front of Receiving Tube Section	
PLATE DISSIPATION	2.4 max.	3 max.	watts

Maximum Circuit Values:

	<i>Triode Unit</i>	<i>Pentode Unit</i>	
Grid-No.1-Circuit Resistance: ^a			
For fixed-bias operation	0.5 max.	0.25 max.	megohm
For cathode-bias operation	1 max.	1 max.	megohm

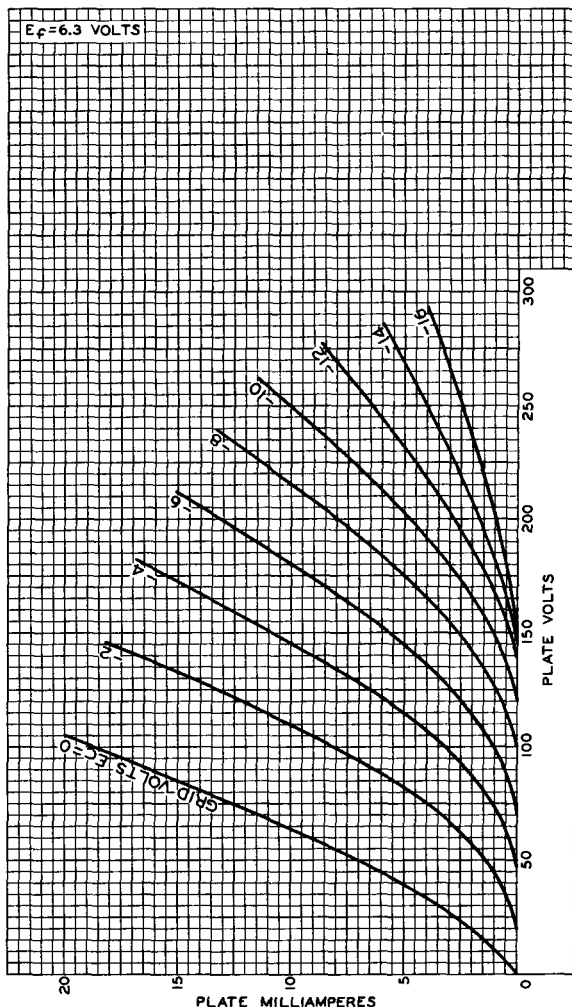
^a The dc component must not exceed 100 volts.

^b Without external shield.

^c If either unit is operated at maximum rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.



AVERAGE PLATE CHARACTERISTICS Triode Unit



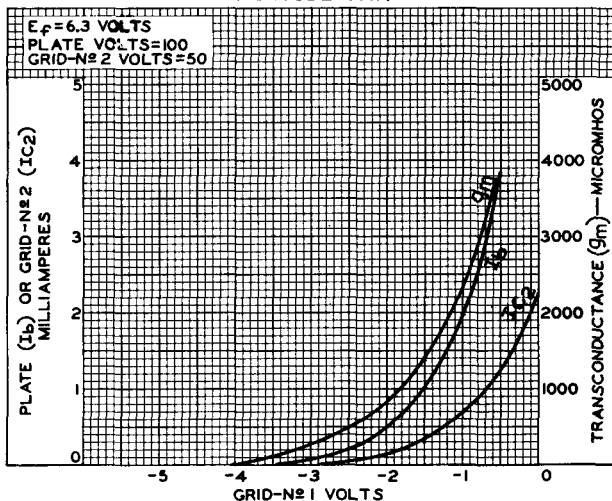
92CM-9693



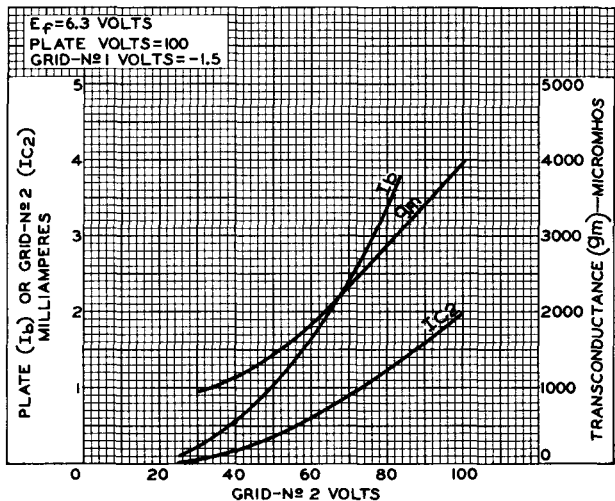


7199

7199

AVERAGE CHARACTERISTICS
PENTODE UNIT

92CS-9702





7199

7199

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

For high-fidelity audio-amplifier applications critical as to noise and hum

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage. 6.3 $\pm$ 10% ac or dc volts

Current. 0.45 amp

Direct Interelectrode Capacitances:⁰

Triode Unit:

Grid to plate. 2 μf Grid to cathode and heater 2.3 μf Plate to cathode and heater. 0.3 μf

Pentode Unit:

Grid No.1 to plate 0.06 max. μf Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater 5 μf Plate to cathode & internal shield & grid No.3, grid No.2, and heater 2 μf

Equivalent-Hum and Noise Voltage (Referenced to Grid):

Triode Unit

Median Value (RMS) 10 microvolts

Maximum Value (RMS). 150 microvolts

Measured in "true rms" units under the following conditions:
heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate load resistor (megohms) = 0.1, cathode resistor (ohms) = 1500, grid resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

Pentode Unit

Median Value (RMS) 35 microvolts

Maximum Value (RMS). 100 microvolts

Measured in "true rms" units under the following conditions:
heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate-load resistor (megohms) = 0.1, grid-No.2 supply volts = 250, grid-No.2 resistor (megohms) = 0.33, grid-No.2-bypass capacitor (μf) = 0.22, cathode resistor (ohms) = 1200, grid-No.1 resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

Characteristics, Class A₁ Amplifier:

	Triode Unit	Pentode Unit	
Plate-Supply Voltage	215	100 220	volts

⁰: See next page.



7199

MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	Triode Unit	Pentode Unit	
Grid-No.2 Supply voltage . . .	—	50 130	volts
Grid-No.1 Voltage	-8.5	— —	volts
Cathode Resistor	—	1000 62	ohms
Amplification Factor	17	— —	
Plate Resistance (Approx.) . .	0.0081	1 0.4	megohm
Transconductance	2100	1500 7000	μ hos
Plate Current	9	1.1 12.5	ma
Grid-No.2 Current	—	0.35 3.5	ma
Grid-No.1 Voltage (Approx.) for plate μ a = 10.	-40	-4 —	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip).	1-9/16" $\pm$ 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	See General Section
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No. E9-1)
Basing Designation for BOTTOM VIEW	.9JT

Pin 1—Triode
Plate
Pin 2—Pentode
Plate
Pin 3—Pentode
Grid No.2
Pin 4—Heater
Pin 5—Heater



Pin 6—Pentode
Cathode,
Grid No.3,
Internal
Shield
Pin 7—Pentode
Grid No.1
Pin 8—Triode
Cathode
Pin 9—Triode
Grid

AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

	Triode Unit	Pentode Unit	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	—	330 max.	volts
GRID-No.2 VOLTAGE	—	See Grid-No.2 Input	
Rating Chart at front of Receiving Tube Section			
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value.	0 max.	0 max.	volts

0: See next page.