

## Sharp-Cutoff Pentode

## 7-PIN MINIATURE TYPE

For High-Gain, Resistance-Coupled-Amplifier Applications Critical as to Hum and Microphonism

## GENERAL DATA

## Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC) . . . . .	6.3	volts
Current . . . . .	0.3	amp

Direct Interelectrode Capacitances:

	Without External Shield	With External Shield <sup>▲</sup>	
<i>Pentode Connection:</i>			
Grid No.1 to plate. . . . .	0.0035 max.	0.0035 max.	$\mu\text{f}$
Grid No.1 to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	5.5	5.5	$\mu\text{f}$
Plate to cathode, grid No.3 & internal shield, grid No.2, and heater . . . . .	5	5	$\mu\text{f}$
<i>Triode Connection:</i> <sup>●</sup>			
Grid No.1 to plate, grid No.3 & internal shield, and grid No.2 . . . . .	2.6	2.6	$\mu\text{f}$
Grid No.1 to cathode and heater. . . . .	3.2	3.2	$\mu\text{f}$
Plate, grid No.3 & internal shield, and grid No.2 to cathode and heater. . . . .	1.2	8.5	$\mu\text{f}$

## Hum Output Voltage:

Average Value (RMS, Cathode Bypassed) . . . . . 1.2 millivolts

Measured in "true rms" units under the following conditions:  
heater volts = 6.3; center-tap of heater transformer connected to ground; plate and grid-No.2 supply volts = 250; plate load resistor (megohms) = 0.27; grid No.3 and internal shield connected to cathode at socket; grid-No.2 resistor (megohms) = 0.68; grid-No.1 resistor (megohms) = 0.1; cathode resistor (ohms) = 1000; grid resistor of following stage (megohms) = 10; and stage gain of 340.

Average Value (RMS, Cathode Unbypassed) . . . . . 0.9 millivolt

Measured in "true rms" units under the same conditions as for "Average Value" except that the cathode resistor is unbypassed, and the stage gain is 110.

Characteristics, Class A<sub>1</sub> Amplifier:*Pentode Connection*

Plate Supply Voltage. . . . .	100	250	250	volts
Grid No.3 & Internal Shield . . . . .	Connected to cathode at socket			



Grid-No.2 Supply Voltage. . . . .	100	125	150	volts
Cathode Resistor. . . . .	150	100	68	ohms
Plate Resistance (Approx.). . . . .	0.5	1.5	1	megohms
Transconductance. . . . .	3900	4500	5200	$\mu$ mhos
Plate Current . . . . .	5	7.6	10.6	ma
Grid-No.2 Current . . . . .	2.1	3	4.3	ma
Grid-No.1 Voltage (Approx.) for plate $\mu$ a = 10 . . . . .	-4.2	-5.5	-6.5	volts

**Triode Connection\***

Plate Supply Voltage. . . . .	250	volts
Cathode Resistor. . . . .	330	ohms
Amplification Factor. . . . .	36	
Plate Resistance (Approx.). . . . .	7500	ohms
Transconductance. . . . .	4800	$\mu$ mhos
Plate Current . . . . .	12.2	ma

**Mechanical:**

Operating Position. . . . .	Any
Maximum Overall Length. . . . .	2-1/8"
Maximum Seated Length . . . . .	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip). . . . .	1-1/2" $\pm$ 3/32"
Diameter. . . . .	0.650" to 0.750"
Dimensional Outline . . . . .	See <i>General Section</i>
Bulb. . . . .	T5-1/2
Base. . . . .	Small-Button Miniature 7-Pin (JEDEC No.E7-1)
Basing Designation for BOTTOM VIEW. . . . .	7BK

- Pin 1 - Grid No.1
- Pin 2 - Grid No.3,  
Internal  
Shield
- Pin 3 - Heater



- Pin 4 - Heater
- Pin 5 - Plate
- Pin 6 - Grid No.2
- Pin 7 - Cathode

**AMPLIFIER — Class A<sub>1</sub>**

**Maximum Ratings, Design-Center Values:**

	Triode Connection*	Pentode Connection	
PLATE VOLTAGE . . . . .	250 max.	300 max.	volts
GRID No.3 (SUPPRESSOR GRID) . . . . .	-	Connect to cathode at socket	
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE. . . . .	-	300 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
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 150 volts . . . . .	-	0.65 max.	watt
For grid-No.2 voltages be- tween 150 and 300 volts . . . . .	-	See Grid-No.2 Input Rating Chart at front of Receiving Tube Section	



PLATE DISSIPATION. . . . .	3.2 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode . . . . .	200 max.	200 max.	volts
Heater positive with respect to cathode . . . . .	200* max.	200* max.	volts

**Typical Operation as Resistance-Coupled Amplifier:**

*See RESISTANCE-COUPLED-AMPLIFIER CHART No. 8  
at front of this Section*

- ▲ With external shield JEDEC No. 316 connected to cathode.
- Grid No. 3 & internal shield and grid No. 2 connected to plate.
- ★ The dc component must not exceed 100 volts.

**CURVES**

For the 7543, within its ratings, are the same  
as those shown for Type 6AU6

