

Power Pentode

NOVAR TYPE

For High-Fidelity Audio-Amplifier Applications

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 $\pm$ 10%	volts
Current at 6.3 volts.	0.8	amp

Direct Interelectrode Capacitances

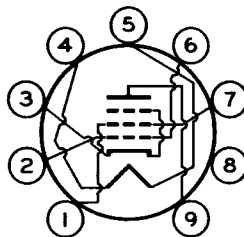
(Approx.):^a

Grid No.1 to plate.	0.15	μ f
Grid No.1 to cathode & grid No.3, grid No.2, and heater	11	μ f
Plate to cathode & grid No.3, grid No.2, and heater	4.4	μ f

Mechanical:

Operating Position.	Any
Maximum Overall Length.	3.24"
Maximum Seated Length	2.86"
Length, Base Seat to Bulb Top (Excluding tip)	2.30" $\pm$ 0.09"
Diameter.	1.062" to 1.188"
Bulb.	T9
Socket.	Cinch Mfg. Corp. No.149 19 00 24, or equivalent
Base.	Small-Button Novar 9-Pin (JEDEC No.E9-75)
Basing Designation for BOTTOM VIEW.	9NZ

Pin 1-Grid No.2
 Pin 2-Grid No.1
 Pin 3-Cathode,
 Grid No.3
 Pin 4-Heater
 Pin 5-Heater



Pin 6-Grid No.1
 Pin 7-Grid No.2
 Pin 8-Internal Con-
 nection—
 Do Not Use
 Pin 9-Plate

AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	550	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	440	max.	volts
CATHODE CURRENT.	90	max.	ma
GRID-No.2 INPUT.	3.3 ^b	max.	watts
PLATE DISSIPATION.	19	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.	200	max.	volts
Heater positive with respect to cathode.	200 ^c	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	240	max.	°C

Typical Operation and Characteristics:

Plate Voltage.	300	volts
Grid-No.2 Voltage.	300	volts



Grid-No.1 (Control-Grid) Voltage.	-10	volts
Peak AF Grid-No.1 Voltage	10	volts
Zero-Signal Plate Current	60	ma
Max.-Signal Plate Current	75	ma
Zero-Signal Grid-No.2 Current	8	ma
Max.-Signal Grid-No.2 Current	15	ma
Plate Resistance (Approx.).	29000	ohms
Transconductance.	10200	μ hos
Effective Load Resistance	3000	ohms
Total Harmonic Distortion	13	%
Max.-Signal Power Output.	11	watts

Maximum-Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.3	max.	megohm
For cathode-bias operation.	1	max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	550	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE	440	max.	volts
CATHODE CURRENT	90	max.	ma
GRID-No.2 INPUT	3.3 ^b	max.	watts
PLATE DISSIPATION	19	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ^c	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).	240	max.	°C

Typical Operation:

Values are for 2 tubes

	Fixed Bias					Cathode Bias	
Plate Supply Voltage.	300	350	400	450	450	450	volts
Grid-No.2 Supply Voltage	300	350	350	350	400	400	volts
Grid-No.1 Voltage.	-12.5	-15.5	-16	-16.5	-21	—	volts
Cathode Resistor (Common to both cathodes)	—	—	—	—	—	170	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage.	25	31	32	33	42	31	volts
Zero-Signal Plate Current.	74	72	64	60	40	86	ma
Max.-Signal Plate Current.	116	130	135	142	145	94	ma
Zero-Signal Grid-No.2 Current	10	9.5	8	7.2	5	10	ma
Max.-Signal Grid-No.2 Current	28	32	28	26	30	20	ma

Effective Load Resistance (Plate to plate)	6600	6600	6600	6600	6600	10000	ohms
Total Harmonic Distortion	5	2.5	2	2.5	5	2	%
Max.-Signal Power Output	24	30	34	38	44	28	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.3 max.	megohm
For cathode-bias operation.	1 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB₁

*Grid No.2 of each tube connected to tap
on plate winding of output transformer*

Maximum Ratings, Design-Maximum Values:

PLATE AND GRID-No.2 (SCREEN-GRID)

SUPPLY VOLTAGE.	440	max.	volts
DC CATHODE CURRENT.	90	max.	ma
GRID-No.2 INPUT	3.3 ^b	max.	watts
PLATE DISSIPATION	19	max.	watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode .	200	max.	volts
Heater positive with respect to cathode .	200 ^c	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface).	240	max.	°C

Typical Operation:*Values are for 2 tubes*

	<i>Fixed Bias</i>	<i>Cathode Bias</i>	
Plate Supply Voltage.	400	425	volts
Grid-No.2 Supply Voltage.	d	d	volts
Grid-No.1 Voltage	-20.5	-	volts
Cathode Resistor (Common to both cathodes)	-	185	ohms
Peak AF Grid-No.1-to- Grid-No.1 Voltage	41	42	volts
Zero-Signal Plate Current	60	88	ma
Max.-Signal Plate Current	115	100	ma
Zero-Signal Grid-No.2 Current	8	12	ma
Max.-Signal Grid-No.2 Current	18	16	ma
Effective Load Resistance (Plate to plate).	6600	6600	ohms
Total Harmonic Distortion	2.5	3.5	%
Max.-Signal Power Output.	23	21	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

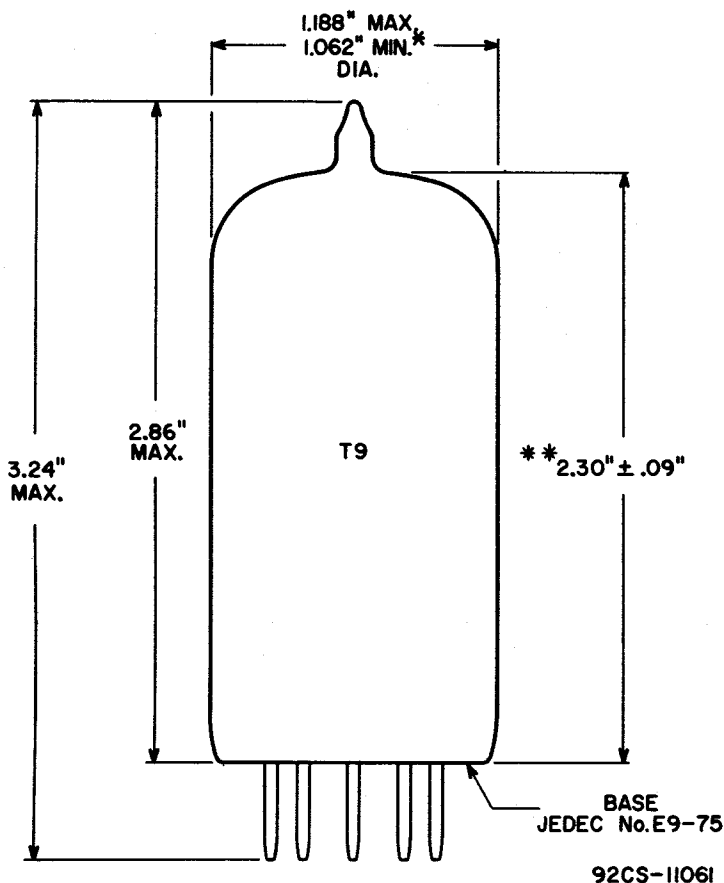
For fixed-bias operation.	0.3 max.	megohm
For cathode-bias operation.	1 max.	megohm



- a Without external shield.
- b Grid-No.2 input may reach 6 watts during peak levels of speech and music signals.
- c The dc component must not exceed 100 volts.
- d Obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center-tap (B+) so as to supply 50 per cent of the plate signal voltage to the grid No.2 of each output tube.

OPERATING CONSIDERATIONS

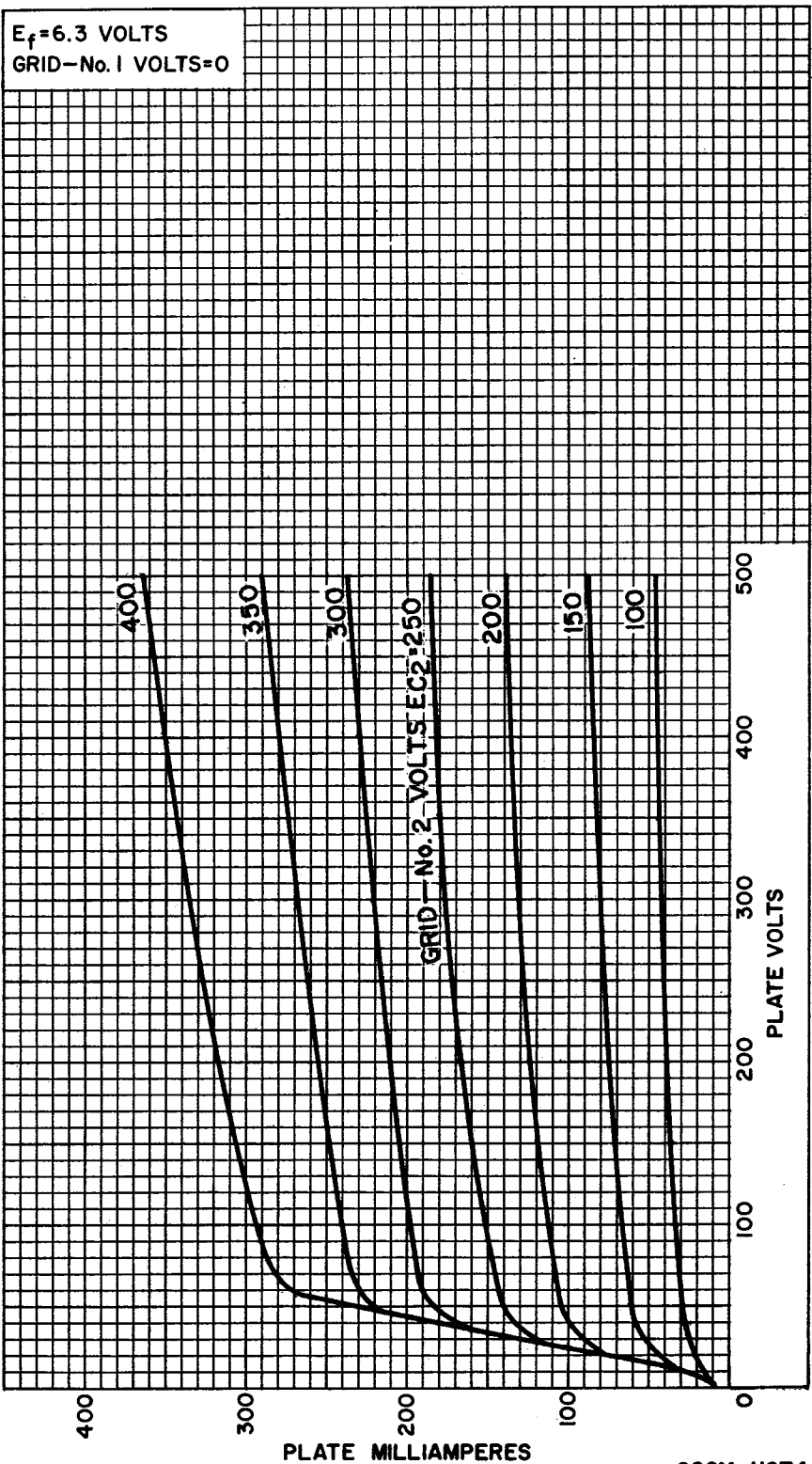
The *bulb* becomes hot during operation. To insure adequate cooling, it is essential that free circulation of air be provided.



* APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

** MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

AVERAGE PLATE CHARACTERISTICS



92CM-11074



AVERAGE CHARACTERISTICS

