7868

Power Pentode

NOVAR TYPE

For High-Fidelity Audio-Amplifier Applications

GENERAL DATA

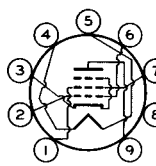
Electrical:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at 6.3 volts	0.8	amp
Direct Interelectrode Capacitances (Approx.):[a]		
Grid No.1 to plate	0.15	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	11	μμf
Plate to cathode & grid No.3, grid No.2, and heater	4.4	μμf

Mechanical:

Operating Position	Any
Maximum Overall Length	3.24"
Maximum Seated Length	2.86"
Length, Base Seat to Bulb Top (Excluding tip)	2.30" ± 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 Connection—Do Not Use
Pin 9 - Plate

AF POWER AMPLIFIER — Class A_1

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

7868

Power Pentode

NOVAR TYPE

For Output Stages of High Fidelity Audio-Amplifiers and Radio Receivers

ELECTRICAL

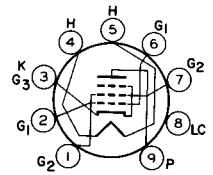
Heater Characteristics and Ratings:		
Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.800	amp
Maximum Heater-Cathode Voltage:		
Heater negative with respect to cathode.	200	volts
Heater positive with respect to cathode		
Peak	200	volts
DC component	100	volts
Direct Interelectrode Capacitances (Approx.):[a]		
Grid No.1 to plate	0.15	pf
Input: G1 to (K + G3, G2, H)	11.0	pf
Output: P to (K + G3, G2, H)	4.4	pf

MECHANICAL

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	3.110 in
Maximum Seated Length	2.730 in
Diameter	1.062 to 1.188 in
Bulb	T9
Dimensional Outline	See *General Section*
Bases (Alternates):	
Small-Button Novar 9-Pin	(JEDEC No.E9-75)
Small-Button Novar 9-Pin with Exhaust Tip	(JEDEC No.E9-89)

BASING DESIGNATION (Bottom View)

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 - LC - See *Note*
Pin 9 - Plate



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Note: May be used as tie point for components operating at or near the DC voltage of either the grid No.2 or plate, or between these voltages. Otherwise, do not use.

AF POWER AMPLIFIER — Class A1

Maximum Ratings, *Design-Maximum Values:*

Plate Voltage	550	volts
Grid-No.2 (Screen-Grid) Voltage	440	volts
Cathode Current	90	ma
Grid-No.2 Input	3.3[b]	watts
Plate Dissipation	19	watts
Bulb Temperature (At hottest point on bulb surface)	240	°C

← Indicates a change.

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		μmhos
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 AB_1

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 AB_1

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

	Fixed Bias	*Cathode Bias*	
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.

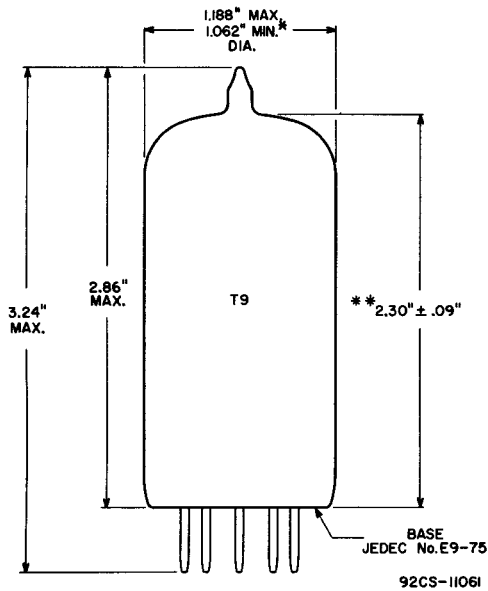
[b] Grid-No.2 input may reach 6 watts during peak levels of speech and music signals.

[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

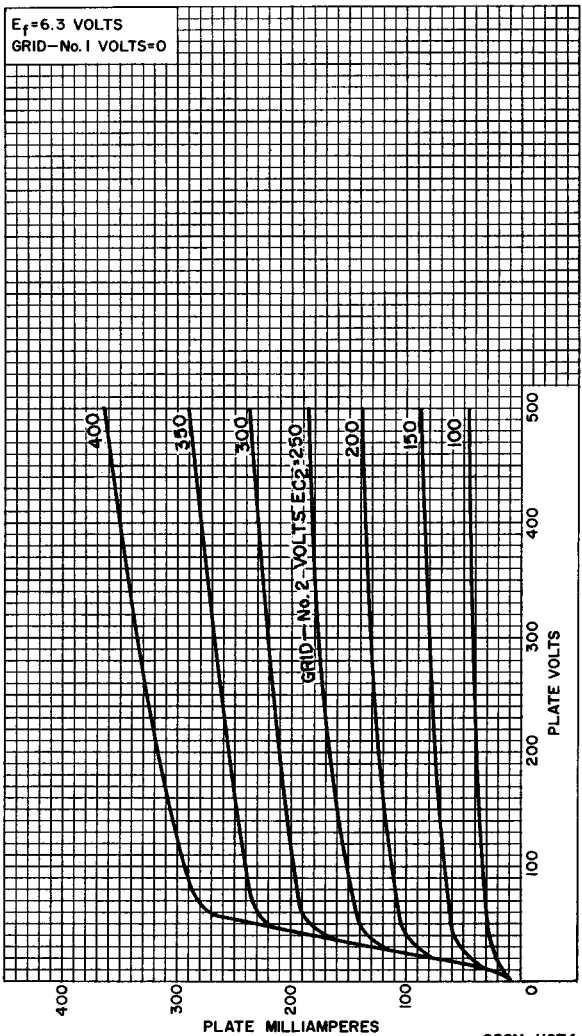
The *bulb* becomes hot during operation. To insure adequate cooling, it is essential that free circulation of air be provided.



* 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



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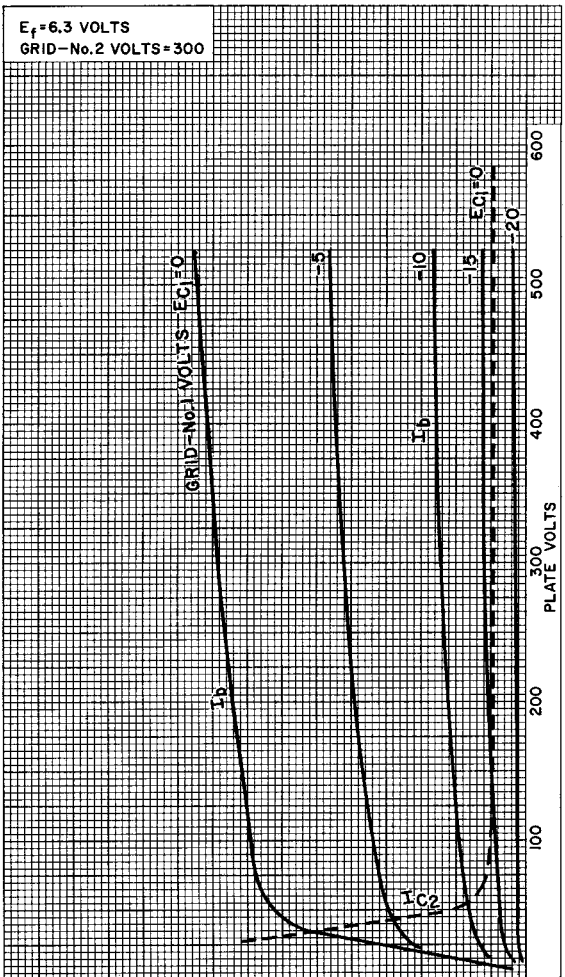
AVERAGE CHARACTERISTICS



92CM-11075

OPERATION CHARACTERISTICS
Push-Pull Class AB_1