

Beam Power Tube

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage (AC or DC)	6.3 $\pm$ 10%	volts
Current at 6.3 volts.	0.9	amp

Direct Interelectrode Capacitances

(Approx.):^A

Grid-No.1 to plate.	0.6	μ f
Grid-No.1 to cathode & grid No.3, grid No.2, and heater	10	μ f
Plate to cathode & grid No.3, grid No.2, and heater	6.5	μ f

Characteristics, Class A₁ Amplifier:

Plate Voltage	250	volts
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	-14	volts
Plate Resistance (Approx.)	22500	ohms
Transconductance.	6000	μ hos
Plate Current	72	ma
Grid-No.2 Current	5	ma

Mechanical:

Operating Position.	Any
Maximum Overall Length.	4-1/4"
Maximum Seated Length	3-11/16"
Diameter.	1.438" to 1.562"
Bulb.	T-12
Base.	Medium-Shell Octal 7-Pin (JEDEC Group 1, No.B7-12), Short Medium-Shell Octal 7-Pin with External Barriers Style A (JEDEC Group 1, No.B7-111) or Style B (JEDEC Group 1, No.B7-119), or Short Medium-Shell Octal 6-Pin with External Barriers Style A (JEDEC Group 1, No.B6-148) or Style B (JEDEC Group 1, No.B6-122)
Basing Designation for BOTTOM VIEW.	7AC

- Pin 1 • - No Connection
Pin 2 - Heater
Pin 3 - Plate
Pin 4 - Grid No.2



- Pin 5 - Grid No.1
Pin 7 - Heater
Pin 8 - Cathode,
Grid No.3

AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	500	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	450	max.	volts
GRID-No.2 INPUT.	5	max.	watts
PLATE DISSIPATION.	30	max.	watts



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PEAK HEATER-CATHODE VOLTAGE:

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

Heater positive with respect to cathode. . 200* max. volts

Typical Operation and Characteristics:

Fixed-Bias Operation

Plate Voltage.	200	250	300	350	volts
Grid-No.2 Voltage.	200	250	200	250	volts
Grid-No.1 (Control-Grid)- Voltage.	-11.5	-14	-12.5	-18	volts
Peak AF Grid-No.1 Voltage.	11.5	14	12.5	18	volts
Zero-Signal Plate Current.	52	72	48	54	ma
Max.-Signal Plate Current.	57	79	55	66	ma
Zero-Signal Grid-No.2 Current.	3.5	5	2.5	2.5	ma
Max.-Signal Grid-No.2 Current.	5.7	7.3	4.7	7	ma
Plate Resistance (Approx.).	35000	22500	35000	33000	ohms
Transconductance	5300	6000	5300	5200	μ mhos
Load Resistance.	3000	2500	4500	4200	ohms
Total Harmonic Distortion.	9	10	11	15	%
Max.-Signal Power Output	4	6.5	6.5	10.8	watts

Cathode-Bias Operation

Plate Supply Voltage	200	250	300	volts
Grid-No.2 Supply Voltage	200	250	200	volts
Cathode Resistor	186	167	218	ohms
Peak AF Grid-No.1 Voltage.	11.5	14	12.7	volts
Zero-Signal Plate Current.	55	75	51	ma
Max.-Signal Plate Current.	56	78	54.5	ma
Zero-Signal Grid-No.2 Current.	4.2	5.4	3	ma
Max.-Signal Grid-No.2 Current.	5.6	7.2	4.6	ma
Load Resistance.	3000	2500	4500	ohms
Total Harmonic Distortion.	9	10	11	%
Max.-Signal Power Output	4	6.5	6.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation 0.1 max. megohm

For cathode-bias operation 0.5 max. megohm

AF POWER AMPLIFIER — Class A₁

Triode Connection — Grid No.2 Connected to Plate

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	450	max.	volts
PLATE DISSIPATION.	30	max.	watts

PEAK HEATER-CATHODE VOLTAGE:

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

Heater positive with respect to cathode. . 200* max. volts



Typical Operation and Characteristics:

	Fixed Bias	Cathode Bias	
Plate Supply Voltage.	250	250	volts
Grid-No.1 (Control-Grid) Voltage. . .	-20	-	volts
Cathode Resistor.	-	490	ohms
Peak AF Grid-No.1 Voltage	20	20	volts
Zero-Signal Plate Current	40	40	ma
Maximum-Signal Plate Current.	44	42	ma
Plate Resistance (Approx.).	1700	-	ohms
Amplification Factor.	8	-	
Transconductance.	4700	-	μmhos
Load Resistance	5000	6000	ohms
Total Harmonic Distortion	5	6	%
Maximum-Signal Power Output	1.4	1.3	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.5 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class A₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	500	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	450	max.	volts
GRID-No.2 INPUT.	5	max.	watts
PLATE DISSIPATION.	30	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. .	200	max.	volts
Heater positive with respect to cathode. .	200*	max.	volts

Typical Operation and Characteristics:

Unless otherwise specified, values are for 2 tubes

	Fixed Bias		Cathode Bias		
Plate Supply Voltage.	250	270	250	270	volts
Grid-No.2 Supply Voltage.	250	270	250	270	volts
Grid-No.1 Voltage	-16	-17.5	-	-	volts
Cathode Resistor.	-	-	124	124	ohms
Peak AF Grid-No.1-to-					
Grid-No.1 Voltage	32	35	35.6	28.2	volts
Zero-Signal Plate Current.	120	134	120	134	ma
Max.-Signal Plate Current	140	155	130	145	ma
Zero-Signal Grid-No.2					
Current	10	11	10	11	ma
Max.-Signal Grid-No.2					
Current	16	17	15	17	ma
Plate Resistance (Approx.,					
per tube)	24500	23500	-	-	ohms
Transconductance (Per tube).	5500	5700	-	-	μmhos
Effective Load Resistance					
(Plate to plate).	5000	5000	5000	5000	ohms
Total Harmonic Distortion	2	2	2	2	%
Max.-Signal Power Output.	14.5	17.5	13.8	18.5	watts



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Maximum Circuit Values:

Grid-No.1-Circuit Resistance:

For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.5 max.	megohm

PUSH-PULL AF POWER AMPLIFIER — Class AB₁

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE	500	max.	volts
GRID-No.2 VOLTAGE	450♦	max.	volts
GRID-No.2 INPUT	5	max.	watts
PLATE DISSIPATION	30	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	200	max.	volts
Heater positive with respect to cathode .	200*	max.	volts

Typical Operation:

Values are for 2 tubes

	Fixed Bias			Cathode Bias	
Plate Supply Voltage. . . .	360	450	450	360	volts
Grid-No.2 Supply Voltage. .	270	350	400	270	volts
Grid-No.1 (Control-Grid)					
Voltage♦.	-22.5	-30	-37	-	volts
Cathode Resistor.	-	-	-	248	ohms
Peak Af Grid-No.1-to-					
Grid-No.1 Voltage	45	60	70	40.6	volts
Zero-Signal Plate Current. .	88	95	116	88	ma
Max.-Signal Plate Current .	132	194	210	100	ma
Zero-Signal Grid-No.2					
Current	5	3.4	5.6	5	ma
Max.-Signal Grid-No.2					
Current	15	19.2	22	17	ma
Effective Load Resistance					
(Plate to plate).	6600	6000	5600	9000	ohms
Total Harmonic Distortion .	2	1.5	1.8	4	%
Max.-Signal Power Output. .	26.5	50	55	24.5	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:♦

For fixed-bias operation.	0.1 max.	megohm
For cathode-bias operation.	0.5 max.	megohm

PUSH-PULL AF AMPLIFIER — Class AB₂

Maximum Ratings, Design-Maximum Values:

PLATE VOLTAGE.	500	max.	volts
GRID-No.2 (SCREEN-GRID) VOLTAGE.	450♦	max.	volts
GRID-No.2 INPUT.	5	max.	watts
PLATE DISSIPATION.	30	max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode. .	200	max.	volts
Heater positive with respect to cathode. .	200*	max.	volts



Typical Operation:

Values are for 2 tubes

	Fixed Bias		
Plate Voltage.	360	360	volts
Grid-No.2 Voltage.	225	270	volts
Grid-No.1 (Control-Grid) Voltage [▲]	-18	-22.5	volts
Peak AF Grid-No.1 to Grid-No.1 Voltage.	52	72	volts
Zero-Signal Plate Current.	78	88	ma
Max.-Signal Plate Current.	142	205	ma
Zero-Signal Grid-No.2 Current.	3.5	5	ma
Max.-Signal Grid-No.2 Current.	11	16	ma
Effective Load Resistance (Plate to plate).	6000	3800	ohms
Peak Grid-Input Power [▲]	140	270	mw
Total Harmonic Distortion.	2	2	%
Max.-Signal Power Output	31	47	watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:[▲]

For fixed-bias operation	0.1 max. megohm
For cathode-bias operation	Not recommended

[▲] Without external shield.

● On the 6-pin bases, pin 1 as well as pin 6 is omitted.

★ The dc component must not exceed 100 volts.

◆ In push-pull circuits where grid No.2 of each tube is connected to a tap on the plate winding of the output transformer, it is permissible for this voltage to be as high as 500 volts.

♣ The type of input coupling used should not introduce too much resistance in the grid-No.1 circuit. Transformer- or impedance-coupling devices are recommended.

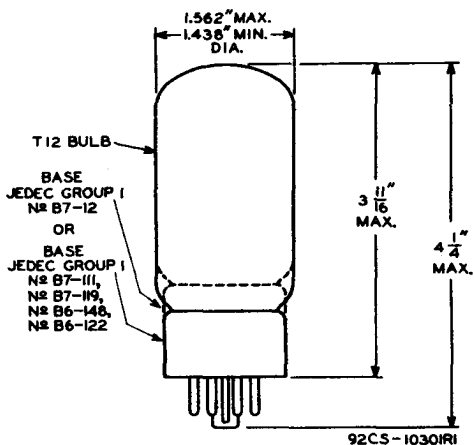
◆ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the AB₂ stage. To minimize distortion, the effective resistance per grid-No.1 circuit of the AB₂ stage should be held at a low value. For this purpose, the use of transformer coupling is recommended.

OPERATING CONSIDERATIONS

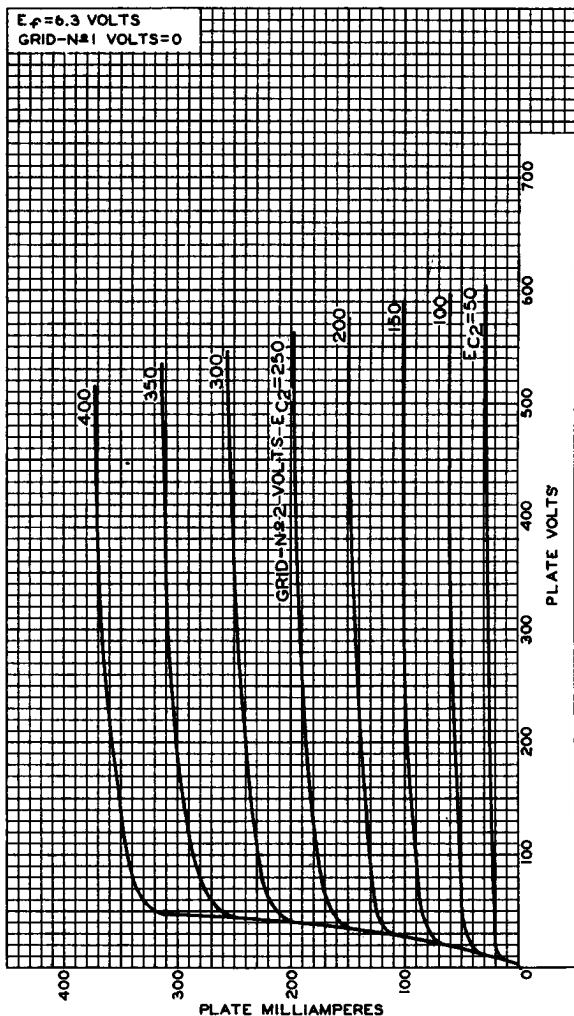
The *bulb* becomes hot during operation. To insure adequate cooling, therefore, it is essential that free circulation of air be provided.



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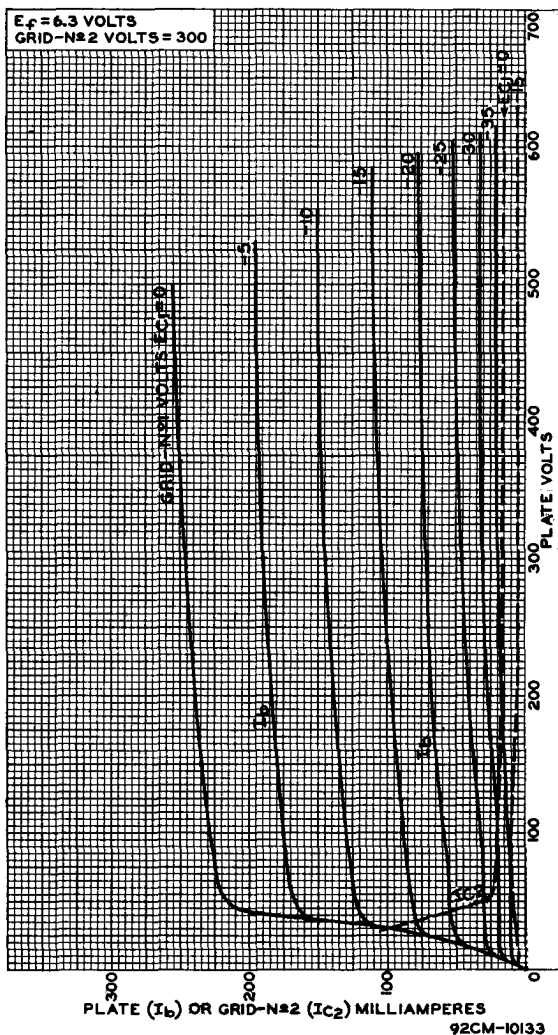
AVERAGE PLATE CHARACTERISTICS



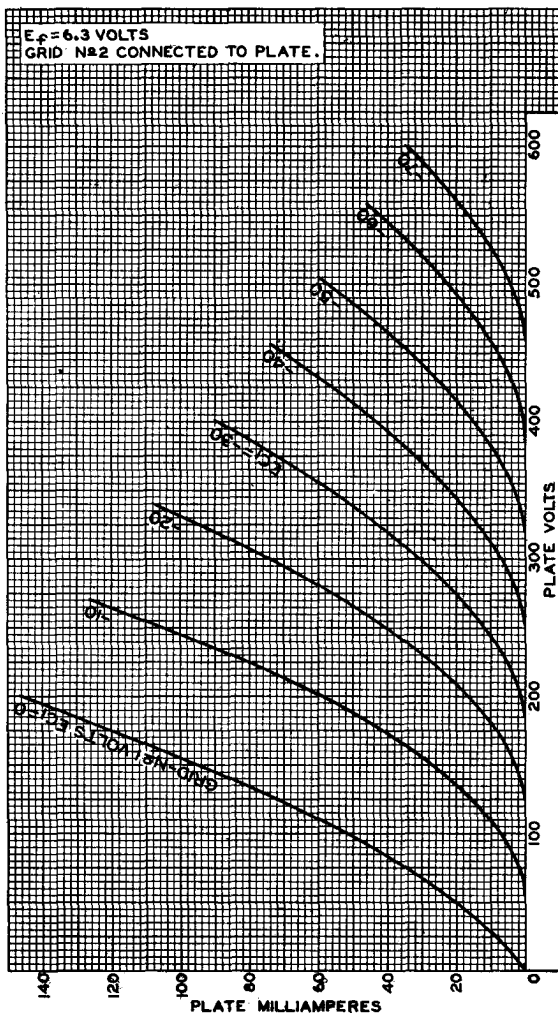
92CM-10327



AVERAGE CHARACTERISTICS



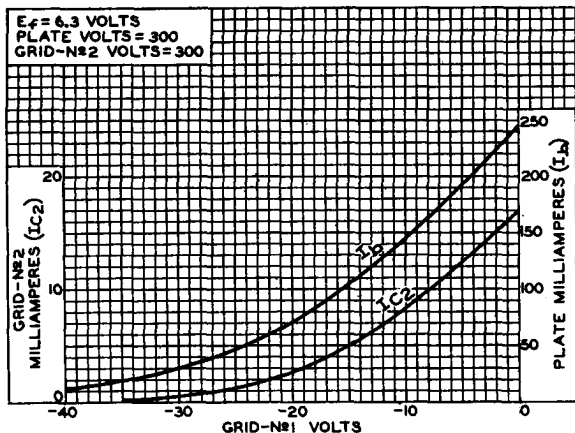
AVERAGE PLATE CHARACTERISTICS Triode Connection



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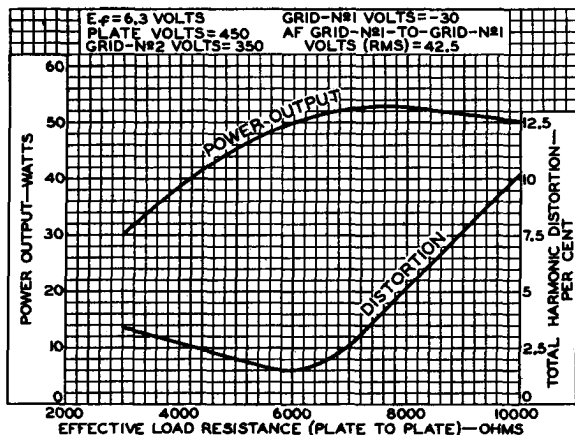


AVERAGE CHARACTERISTICS



92CS-10126

OPERATION CHARACTERISTICS Push-Pull Class AB₁



92CS-9575