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PUSH-PULL RF BEAM POWER AMPLIFIER

UNLESS OTHERWISE SPECIFIED, VALUES ARE ON A PER-TUBE BASIS

GENERAL DATA**Electrical:**

Heater, for Unipotential Cathodes:

Heater Arrangement	<u>Series</u>	<u>Parallel</u>
Voltage.	12.6 $\pm$ 10%	6.3 $\pm$ 10% ac or dc volts
Current.	0.8	1.6 amp

Transconductance (Approx., each unit)

For grid-No.2 volts = 135 and plate ma. = 30. . . 3500 μ hos

Mu-Factor, Grid No.2 to Grid No.1

(Approx., each unit)

For grid-No.2 volts = 250 and plate ma. = 30. . . 6.5

Direct Interelectrode Capacitances (Each Unit):

Grid-No.1 to Plate ^o	0.07 max.	μ mf
Input.	8.0 . . .	μ mf
Output.	3.8 . . .	μ mf

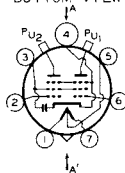
Grid-No.2-to-Cathode Capacitance

including internal grid-No.2

bypass capacitor (Approx.) 65 . . . μ mf^o With external shield in plane of seal flange.**Mechanical:**

Mounting Position.	Any
Overall Length.	3-3/16" $\pm$ 1/8"
Seated Length.	2-3/4" $\pm$ 1/8"
Maximum Diameter.	See Outline Drawing
Bulb Terminals.	See Outline Drawing
Base.	Medium Molded-Flare Septar 7-Pin (JETEC No.E7-2)
Basing Designation for BOTTOM VIEW.	7BP

- Pin 1-Heater
 Pin 2-Grid No.1 of
 Unit No.2
 Pin 3-Grid No.2
 Pin 4-Cathode,
 Grid No.3
 Pin 5-Heater
 Center-Tap



- Pin 6-Grid No.1 of
 Unit No.1
 Pin 7-Heater
 PU1-Plate of
 Unit No.1
 PU2-Plate of
 Unit No.2

PLANE OF ELECTRODES OF EACH UNIT
 IS PARALLEL TO PLANE THROUGH AXIS
 OF TUBE AND AA'

Bulb Temperature (At hottest point). 200 max. ^oC**PLATE-MODULATED PUSH-PULL RF POWER AMP. - Class C Telephony**

Carrier conditions per tube for use with a max.modulation factor of 1.0

Maximum Ratings, Absolute Values:

	CCS*	ICAS**
DC PLATE VOLTAGE.	600 max.	600 max. volts
DC GRID-No.2 (SCREEN) VOLTAGE.	250 max.	250 max. volts

*, **: See next page.

← Indicates a change.

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	CCS*	ICAS**	
DC GRID-No.1 (CONTROL- GRID) VOLTAGE.	-175 max.	-175 max.	volts
DC PLATE CURRENT.	75 max.	95 max.	ma
DC GRID-No.1 CURRENT.	6 max.	6 max.	ma
PLATE INPUT	22 max.	36 max.	watts
GRID-No.2 INPUT	3.4 max.	5 max.	watts
PLATE DISSIPATION	10 max.	15 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode.	100 max.	100 max.	volts
Heater positive with respect to cathode.	100 max.	100 max.	volts

→ Typical Operation

DC Plate Voltage.	425	600	600	volts
DC Grid-No.2 Voltage#	200	200	200	volts
From series resistor of	14000	25000	20000	ohms
DC Grid-No.1 Voltage ^{▲▲} . . .	-60	-65	-70	volts
From grid resistor of	25000	25000	23000	ohms
Peak RF Grid-No.1-to- Grid-No.1 Voltage	140	150	160	volts
DC Plate Current.	52	36	60	ma
DC Grid-No.2 Current.	16	16	20	ma
DC Grid-No.1 Cur. (Approx.) . .	2.4	2.6	3.0	ma
Driving Power (Approx.) . . .	0.15	0.18	0.21	watt
Power Output (Approx.)	16	17	26	watts

PUSH-PULL RF POWER AMPLIFIER & OSCILLATOR-Class C Telegraphy

Key-down conditions per tube without modulation^{□□}

→ Maximum Ratings, Absolute Values:

	CCS*	ICAS**	
DC PLATE VOLTAGE.	750 max.	750 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	250 max.	250 max.	volts
DC GRID-No.1 (CONTROL- GRID) VOLTAGE.	-175 max.	-175 max.	volts
DC PLATE CURRENT.	90 max.	115 max.	ma
DC GRID-No.1 CURRENT.	6 max.	6 max.	ma
PLATE INPUT	36 max.	50 max.	watts
GRID-No.2 INPUT	5 max.	5 max.	watts
PLATE DISSIPATION	15 max.	20 max.	watts

Obtained from a separate source modulated with the plate supply, or from the modulated plate supply through a series resistor of the value shown.

▲▲ Obtained from a grid resistor of value shown (per tube) or by partial self-bias methods.

□□ Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

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	CCS*		ICAS**	
PEAK HEATER-CATHODE VOLTAGE:				
Heater negative with respect to cathode . .	100 max.		100 max.	volts
Heater positive with respect to cathode . .	100 max.		100 max.	volts
Typical Operation:				
DC Plate Voltage	500	750	750	volts
DC Grid-No.2 Voltage**	200	200	200	volts
From series resistor of . .	21000	37000	25000	ohms
DC Grid-No.1 Voltage*.	-65	-65	-50	volts
From grid resistor of	25000	23000	12500	ohms
From cathode resistor of . .	730	1000	550	ohms
Peak RF Grid-No.1-to-				
Grid-No.1 Voltage	150	150	130	volts
DC Plate Current	72	48	65	ma
DC Grid-No.2 Current	14	15	22	ma
DC Grid-No.1 Current (Approx.)	2.6	2.8	4.0	ma
Driving Power (Approx.) . . .	0.18	0.19	0.24	watt
Power Output (Approx.)	26	26	35	watts

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current (Each section).	1	0.76	0.84	amp
Grid No.1—Plate Capacitance (Each unit).	2	—	0.07	μf
Input (Each unit).	—	6.6	9.4	μf
Output (Each unit).	—	2.8	4.8	μf
Plate Current (Each unit).	3	18	42	ma
Grid-No.2 Current (Each unit).	3	0.1	5.5	ma
Positive Grid-No.1 Current (Each unit).	4	8	52	ma
Useful Power Output (Per tube)	5	14	—	watts

Note 1: With 6.3 volts on heater section under test.

Note 2: With external shield in plane of seal flange.

Note 3: With 6.3 volts on heater sections in parallel, dc plate voltage of 250 volts on unit under test, dc grid-No.2 voltage of 135 volts, dc grid-No.1 voltage of -10 volts on unit under test, and dc grid-No.1 voltage of -100 volts on unit not under test.

Note 4: With 6.3 volts on heater sections in parallel, dc plate voltage of 90 volts on unit under test, dc grid-No.2 voltage of 90 volts, dc grid-No.1 voltage of +20 volts on unit under test, and dc grid-No.1 voltage of -100 volts on unit not under test.

Note 5: In a push-pull self-excited oscillator circuit with 11 volts on heater sections in series, dc plate voltage of 400 volts on each unit, max. dc grid-No.2 voltage of 250 volts, total dc plate current of 90 ma., total dc grid-No.1 current of 2 to 6 ma., grid-No.1 resistor of 8000 to 18000 ohms, and frequency of 200 megacycles per second.

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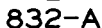
PUSH-PULL RF BEAM POWER AMPLIFIER

- Continuous Commercial Service.
- Intermittent Commercial and Amateur Service.
- Ⓔ The grid-circuit resistance should never exceed 25000 ohms (total) per tube; or 50000 ohms per unit. Any additional bias required must be supplied by a cathode resistor or a fixed supply.
- ★★ Obtained from a separate source, or from the plate-voltage supply with a voltage divider, or through a series resistor of value shown. The grid-No.2 voltage must not exceed 600 volts under key-up conditions.

Data on operating frequencies for the 832-A are given
on the sheet TRANS. TUBE RATINGS vs FREQUENCY

OPERATING NOTES

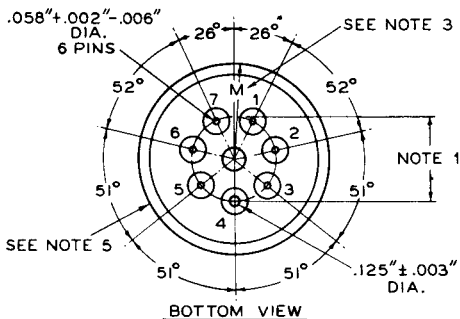
Shielding of the 832-A in an rf amplifier is required for stable operation. A convenient method of shielding is to mount the tube with one end through a hole in a metal plate so that the edge of the hole is close to the internal shield of the tube. Due to the importance, at the ultra-high frequencies, of obtaining the shortest leads possible, rf bypassing must be accomplished close to the tube terminals. Ribbon leads acting as plates of the bypassing capacitors are effective. All circuit returns should be made to the common cathode connection. Rf chokes may be advisable in the voltage-supply leads.



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Technical drawing of a 7-pin base. The drawing shows a cross-section of the component with various dimensions and callouts. Key features include:

- Top Section:** Two pins labeled PU1 and PU2. Dimensions for the top section include $7\frac{1}{16} \pm \frac{1}{16}$ and $2\frac{3}{4} \pm \frac{1}{8}$.
- Body Section:** A central body with a diameter of $.058 \pm .002 / -.006$ DIA. The body has a height of $3\frac{3}{16} \pm \frac{1}{8}$ and a width of $2\frac{3}{16} \pm \frac{3}{16}$.
- Base Section:** A 7-pin base with a height of $1\frac{1}{32} \pm \frac{3}{16}$ (NOTE 6). The base has a diameter of $7\frac{1}{16} \pm \frac{1}{16}$ and a pin diameter of $.000$ MIN. (NOTE 7).
- Callouts:** SEE NOTE 4 and SEE NOTE 2 are indicated for the top section. X and X' are reference points for the body and base sections.
- Dimensions:**
 - Top section: $7\frac{1}{16} \pm \frac{1}{16}$
 - Body section: $2\frac{3}{4} \pm \frac{1}{8}$, $3\frac{3}{16} \pm \frac{1}{8}$, $2\frac{3}{16} \pm \frac{3}{16}$
 - Base section: $1\frac{1}{32} \pm \frac{3}{16}$ (NOTE 6), $7\frac{1}{16} \pm \frac{1}{16}$, $.000$ MIN. (NOTE 7)
 - Overall dimensions: $5\frac{1}{16}$ MIN., $3\frac{3}{8}$ DIA. MAX.



THE REFERENCE AXIS YY' IS DEFINED AS THE AXIS
OF THE BASE-PIN GAUGE DESCRIBED IN NOTE 1

92CM-6374R3

NOTE 1: ANGULAR VARIATIONS BETWEEN PINS AND VARIATION IN PIN-CIRCLE DIAMETER ARE HELD TO TOLERANCES SUCH THAT PINS WILL ENTER TO A DISTANCE OF 0.375" A FLAT-PLATE BASE-PIN GAUGE HAVING SIX HOLES $0.0800" \pm 0.0005"$ AND ONE HOLE $0.1450" \pm 0.0005"$ ARRANGED ON A $1.0000" \pm 0.0005"$ CIRCLE AT SPECIFIED ANGLES WITH TOLERANCE OF $\pm 5'$ FOR EACH ANGLE. GAUGE IS ALSO PROVIDED WITH A HOLE $0.500" \pm 0.010"$ CONCENTRIC WITH PIN CIRCLE WHOSE CENTER IS ON THE AXIS YY'.

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NOTE 2: THE PLATE LEADS WILL ENTER A FLAT-PLATE PLATE-LEAD GAUGE HAVING MINIMUM THICKNESS OF 0.375" AND HAVING TWO HOLES 0.2000" $\pm$ 0.0005" WHOSE CENTERS ARE LOCATED AT A DISTANCE OF 0.424" $\pm$ 0.001" FROM THE AXIS YY' AND WHOSE AXES ARE PARALLEL TO YY'. THE PLANE THROUGH THESE AXES WILL BE 90° $\pm$ 5' FROM THE PLANE THROUGH YY' AND PIN No. 4.

NOTE 3: WHEN THE TUBE IS SEATED IN THE BASE-PIN GAUGE AND CONSTRAINED BY THE PLATE-LEAD GAUGE OF NOTE 2, THE MAXIMUM RADIUS 'M' IS DETERMINED BY LOWERING OVER THE TUBE A CYLINDER GAUGE HAVING A RADIUS OF 1.156" + 0.000" - 0.003" WHOSE AXIS IS COINCIDENT WITH THE YY' AXIS.

NOTE 4: THE PLATE LEADS WILL ENTER A FLAT-PLATE PLATE-LEAD GAUGE HAVING MINIMUM THICKNESS OF 0.375" AND HAVING TWO HOLES 0.2000" $\pm$ 0.0005" WHOSE CENTERS ARE SPACED 0.848" $\pm$ 0.001" FROM EACH OTHER.

NOTE 5: MINIMUM DIAMETER OF TUBE-SEAL FLANGE WILL BE SUCH THAT A RING GAUGE HAVING I.D. OF 2.125" - 0.000" + 0.003" AND THICKNESS OF 0.125" $\pm$ 0.010" WILL NOT PASS THE FLANGE WHEN TRIED AT ANY ANGLE.

NOTE 6: A FLAT-PLATE FLANGE GAUGE WITH HOLE 2.063" - 0.000" + 0.003" IS LOWERED OVER TUBE SEATED IN BASE-PIN GAUGE SO THAT THE HOLE AXIS IS COINCIDENT WITH AXIS YY' WITHIN 0.150", AND SO THAT THE BOTTOM SURFACE OF THE FLANGE GAUGE IS PARALLEL TO THE TOP SURFACE OF THE BASE-PIN GAUGE, AND UNTIL THE FLANGE GAUGE RESTS ON THE TUBE-FLANGE SEAL AT POSITION XX'. THE PERPENDICULAR DISTANCE BETWEEN THE TWO GAUGES WILL BE AS SHOWN.

NOTE 7: EXHAUST TIP WILL NOT EXTEND BEYOND THE PLANE WHICH PASSES THROUGH THE ENDS OF THE THREE LONGEST PINS.

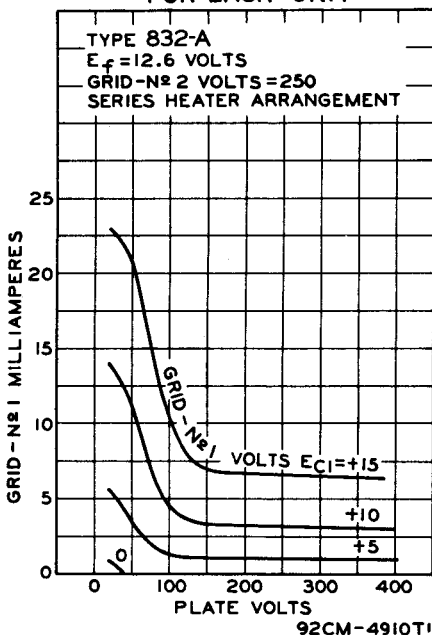


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TYPICAL CHARACTERISTICS FOR EACH UNIT

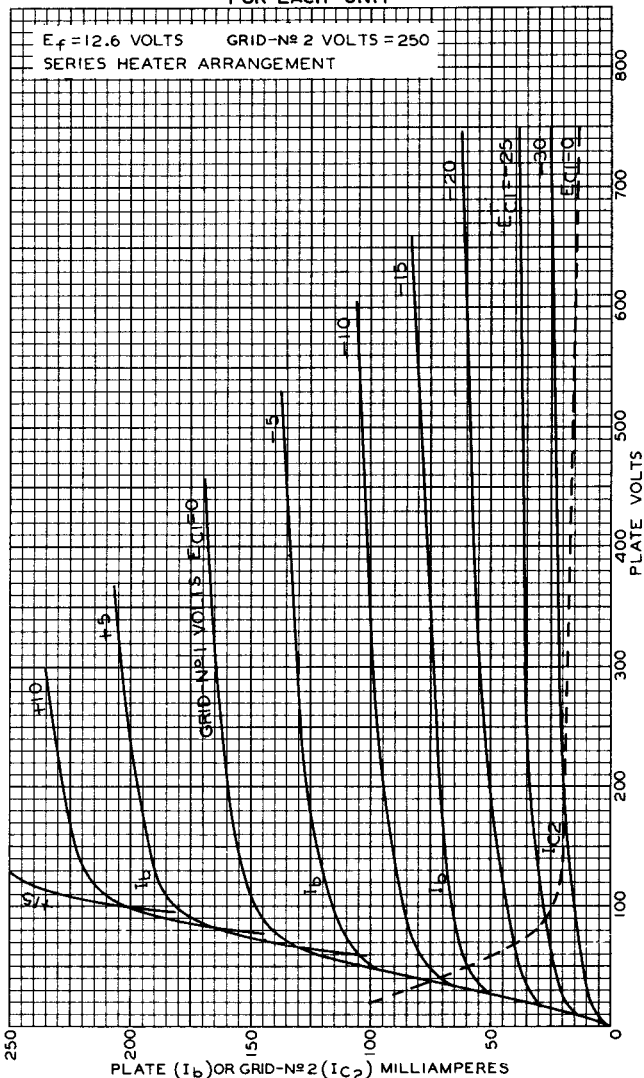


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AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT



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