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PUSH-PULL R-F BEAM POWER AMPLIFIER*Unless otherwise specified, values are for both units*

Heater	Coated Unipotential Cathode [▽]		
Heater Arrangement	<u>Series</u>	<u>Parallel</u>	
Voltage †	12.6	6.3	a-c or d-c volts
Current	0.8	1.6	amp.
Transconductance, for plate current of 25 ma.	4000		μmhos
Grid-Screen Mu-Factor	6.5		
Direct Interelectrode Capacitances (each unit):			
Grid-Plate (with external shielding)		0.2 max.	μpf
Input		14	μpf
Output		8.5	μpf
Maximum Overall Length		4-9/16"	
Maximum Radius		1-3/16"	
Bulb		T-16	
Caps (two)		Small	
Base		Large Wafer Octal 8-Pin, Sleeve	
RCA Socket		Stock No. 9924	

† Should not deviate more than ±10% from the rated value.

▽ In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should not exceed 100 volts.

*Maximum Ratings Are Absolute Values***MAXIMUM CCS and ICAS RATINGS with TYPICAL OPERATING CONDITIONS**

CCS = Continuous Commercial Service

ICAS = Intermittent Commercial and Amateur Service

A-F POWER AMPLIFIER & MODULATOR - Class AB₂#

	<u>CCS</u>	<u>ICAS</u>	
D-C Plate Voltage	400 max.	500 max.	volts
D-C Screen Voltage (Grid #2)	225 max.	225 max.	volts
Max.-Sig. D-C Plate Current*	150 max.	150 max.	ma.
Max.-Sig. Plate Input*	60 max.	75 max.	watts
Max.-Sig. Screen Input*	4.5 max.	4.5 max.	watts
Plate Dissipation*	20 max.	25 max.	watts
Typical Operation:			
D-C Plate Voltage	400	500	volts
D-C Screen Voltage**†	125	125	volts
D-C Grid Voltage			
(Fixed bias, Grid #1)	-15	-15	volts
Peak A-F Grid-to-Grid Volt.	60	60	volts
Zero-Sig. D-C Plate Current	20	22	ma.
Max.-Sig. D-C Plate Current	150	150	ma.
Max.-Sig. D-C Screen Current	32	32	ma.
Load Resistance			
(Per plate)	1550	2000	ohms
Effective Load Resistance			
(Plate to plate)	6200	8000	ohms
Max.-Sig. Driving Power♦	0.36	0.36 approx.	watt
Max.-Sig. Power Output	42	54 approx.	watts

Subscript 2 indicates that grid current flows during some part of input cycle.

* Averaged over any audio-frequency cycle of sine-wave form.

♦ Driver stage should be capable of supplying the grids of the class AB₂ stage with the specified driving power at low distortion. The effective resistance per grid circuit of the class AB₂ stage should be kept below 500 ohms and the effective impedance at the highest desired response frequency should not exceed 700 ohms.

← Indicates a change.

OCT. 1, 1943

RCA VICTOR DIVISION

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

DATA 1



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PUSH-PULL R-F BEAM POWER AMPLIFIER

(continued from preceding page)

PUSH-PULL R-F POWER AMPLIFIER—Class B Telephony

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

	CCS	ICAS	
D-C Plate Voltage	400 max.	500 max.	volts
→ D-C Screen Voltage (Grid #2)	225 max.	225 max.	volts
D-C Plate Current	75 max.	75 max.	ma.
Plate Input	30 max.	37.5 max.	watts
→ Screen Input	4.0 max.	4.0 max.	watts
Plate Dissipation	20 max.	25 max.	watts

Typical Operation:

D-C Plate Voltage	400	500	volts
D-C Screen Voltage** †	125	125	volts
D-C Grid Voltage (Grid #1) ■	-25	-25	volts
Peak R-F Grid-to-Grid Volt.	50	50	volts
D-C Plate Current	75	75	ma.
D-C Screen Current	4	3	ma.
D-C Grid Current	Negligible		ma.
Driving Power ^o	0.8	0.7 approx.	watt
Power Output	10.5	13 approx.	watts

GRID-MODULATED PUSH-PULL R-F POWER AMP. — Class C Telephony

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

	CCS	ICAS	
D-C Plate Voltage	400 max.	500 max.	volts
→ D-C Screen Voltage (Grid #2)	225 max.	225 max.	volts
D-C Grid Voltage (Grid #1)	-175 max.	-175 max.	volts
D-C Plate Current	75 max.	75 max.	ma.
Plate Input	30 max.	37.5 max.	watts
→ Screen Input	4.0 max.	4.0 max.	watts
Plate Dissipation	20 max.	25 max.	watts

Typical Operation:

D-C Plate Voltage	400	500	volts
D-C Screen Voltage †**	125	125	volts
D-C Grid Voltage ■	-40	-40	volts
Peak R-F Grid-to-Grid Volt.	80	80	volts
Peak A-F Grid Voltage	19	17	volts
D-C Plate Current	75	75	ma.
D-C Screen Current	3	3	ma.
D-C Grid Current	0.4	0.4 approx.	ma.
Driving Power ^o	0.32	0.28 approx.	watt
Power Output	10.5	13 approx.	watts

^o At crest of audio-frequency cycle with modulation factor of 1.0.

■ Obtained preferably from a fixed supply.

PLATE-MODULATED PUSH-PULL R-F POWER AMP. — Class C Telephony

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

	CCS	ICAS	
D-C Plate Voltage	325 max.	400 max.	volts
→ D-C Screen Voltage (Grid #2)	225 max.	225 max.	volts
D-C Grid Voltage (Grid #1)	-175 max.	-175 max.	volts
D-C Plate Current	125 max.	150 max.	ma.

**, †: See end of tabulation.

← Indicates a change.



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PUSH-PULL R-F BEAM POWER AMPLIFIER

(continued from preceding page)

	<u>CCS</u>	<u>ICAS</u>	
D-C Grid Current	7 max.	7 max.	ma.
Plate Input	40 max.	60 max.	watts
Screen Input	4.0 max.	4.0 max.	watts
Plate Dissipation	13.5 max.	20 max.	watts
Typical Operation:			
D-C Plate Voltage	325	400	volts
D-C Screen Voltage ^Δ †	{ 165	175	volts
	{ 10000	15000	ohms
D-C Grid Voltage § •	{ -45	-45	volts
	{ 11250	15000	ohms
Peak R-F Grid-to-Grid Volt.	112	116	volts
D-C Plate Current	123	150	ma.
D-C Screen Current	16	15	ma.
D-C Grid Current	4	3 approx.	ma.
Driving Power	0.2	0.16 approx.	watt
Power Output	30	45 approx.	watts

Δ Preferably obtained from a separate source modulated with the plate supply, or obtained from the modulated plate-supply through resistor of value shown.

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

PUSH-PULL R-F POWER AMPLIFIER & OSCILLATOR—Class C Telegraphy*Key-down conditions per tube without modulation ***

	<u>CCS</u>	<u>ICAS</u>	
D-C Plate Voltage	400 max.	500 max.	volts
D-C Screen Voltage (Grid #2)	225 max.	225 max.	volts
D-C Grid Voltage (Grid #1)	-175 max.	-175 max.	volts
D-C Plate Current	150 max.	150 max.	ma.
D-C Grid Current	7 max.	7 max.	ma.
Plate Input	60 max.	75 max.	watts
Screen Input	4.5 max.	4.5 max.	watts
Plate Dissipation	20 max.	25 max.	watts
Typical Operation:			
D-C Plate Voltage	400	500	volts
D-C Screen Voltage ^Δ †	{ 145	200	volts
	{ 15000	17500	ohms
D-C Grid Voltage ^Δ •	{ -45	-45	volts
	{ 10000	13000	ohms
	{ 260	265	ohms
Peak R-F Grid-to-Grid Volt.	116	112	volts
D-C Plate Current	150	150	ma.
D-C Screen Current	17	17	ma.
D-C Grid Current	4.5	3.5 approx.	ma.
Driving Power	0.23	0.18 approx.	watt
Power Output	44	56 approx.	watts

** Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions. †: See next page.

Δ Obtained from a separate source, or from the plate-voltage supply with a voltage divider, or through a series resistor of the value shown. The screen voltage must not exceed 600 volts under key-up conditions.

Δ Obtained from fixed supply, by grid resistor (10000, 13000), or cathode resistor (260, 265).

• The grid-circuit resistance should never exceed 15000 ohms (total) per tube, or 30000 ohms per unit. Any additional bias required must be supplied by a cathode resistor or a fixed supply. ← Indicates a change.



PUSH-PULL R-F BEAM POWER AMPLIFIER

(continued from preceding page)

** Preferably obtained from a separate source, or from the plate-voltage supply with a voltage divider.

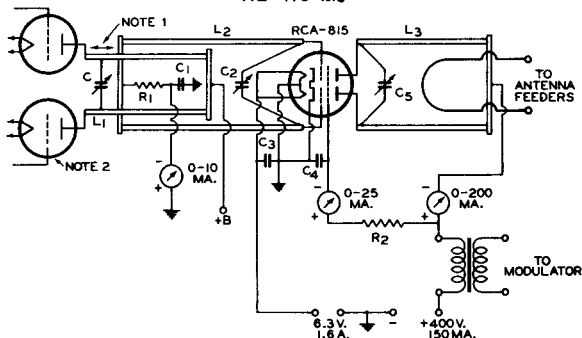
† In applications requiring the use of screen voltages above 135 volts, provision should be made for the adjustment of control-grid bias for each unit separately. The necessity for this adjustment at the lower screen voltages depends on the distortion requirements and on whether the plate-dissipation rating is exceeded at zero-signal plate current.

Data on operating frequencies for the 815 are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY.

Shielding and by-passing considerations for the 815 are similar to those given under Type 832-A.

ULTRA-HIGH-FREQUENCY PLATE-MODULATED PUSH-PULL R-F POWER AMPLIFIER

112-116 Mc



- C₁ See L₁
C₁ C₃ C₄ 1" x 1½" copper sheet insulated from chassis by mica sheet 0.002" thick, or 0.0005-μf "postage stamp" mica condensers soldered to chassis with shortest practicable leads.
- C₂ C₅ Copper discs, 1/16" x 1½". Solder discs to 10-32 brass screws 1" long. Drill and tap grid and plate lines for 10-32 screws.
- R₁ 15000 ohms, 0.5 watt
R₂ 15000 ohms, 25 watts, adjustable.
- L₁ ½" dia. copper tubing. Length of tubing and capacitance of C depend upon driver tubes employed.
- L₂ ½" dia. copper tubing, 12½" long and spaced approx. 7/8" between centers.
- L₃ ½" dia. copper tubing, 13" long and spaced approx. 7/8" between centers.

NOTES

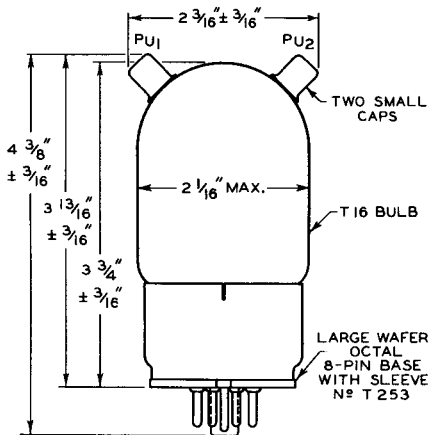
- (1) The r-f driver stage should be able to deliver about one watt of useful r-f power, in order to insure ample grid excitation for the 815.
- (2) Adjust coupling between L₁ and L₂ and tuning of C and C₂ for recommended d-c grid current of the 815.
- (3) L₁ and L₂ should be effectively shielded from L₃ by a metal chassis, or by a vertical metal baffle plate used to mount the 815.
- (4) Adjust coupling of "hairpin" antenna coil to L₃ so that the amplifier is properly loaded.
- (5) A small lumped inductance can be substituted for the amplifier grid lines, if desired. Such a grid coil is preferably tuned by varying its inductance rather than by means of a variable condenser.

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.



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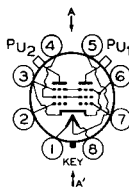
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PUSH-PULL R-F BEAM POWER AMPLIFIER

92CM-6199R4

BOTTOM VIEW OF SOCKET CONNECTIONS

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



- Pin 6 - Cathode, Internal Shield
 Pin 7 - Grid No.1 of Unit No.1
 Pin 8 - Heater
 PU₁ & PU₂ - Plate Terminals of Units No.1 & No.2, respectively

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

TUBE MOUNTING POSITION

Any

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AVERAGE PLATE CHARACTERISTICS FOR EACH UNIT

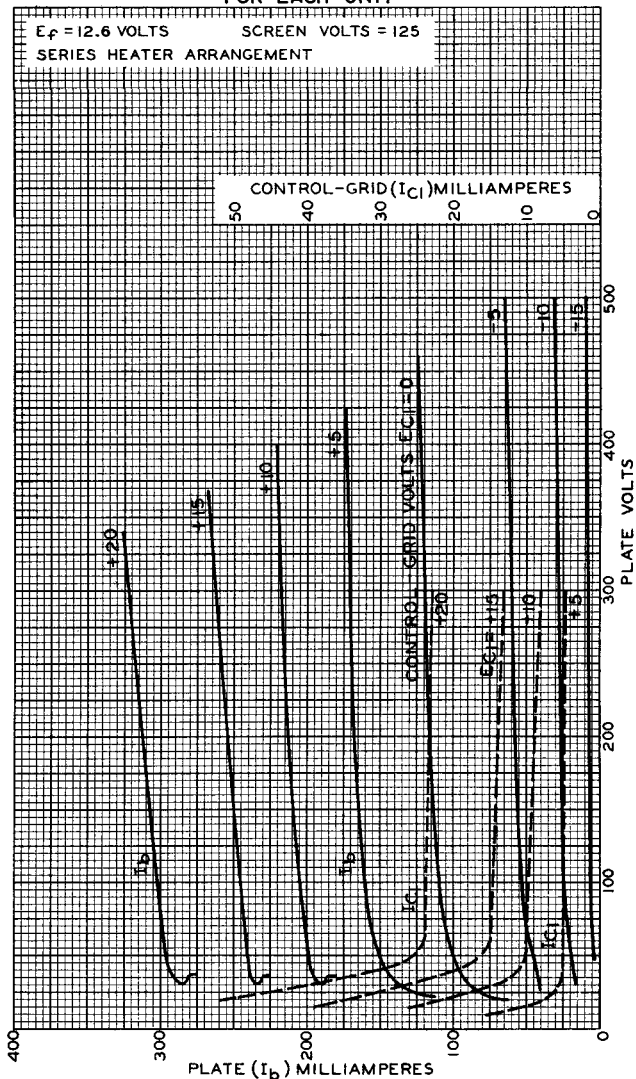
$E_f = 12.6$ VOLTS

SCREEN VOLTS = 125

SERIES HEATER ARRANGEMENT

CONTROL-GRID (I_{C1}) MILLIAMPERES

50 40 30 20 10 0



SEPT. 17, 1943

RCA VICTOR DIVISION

92C-6206R1

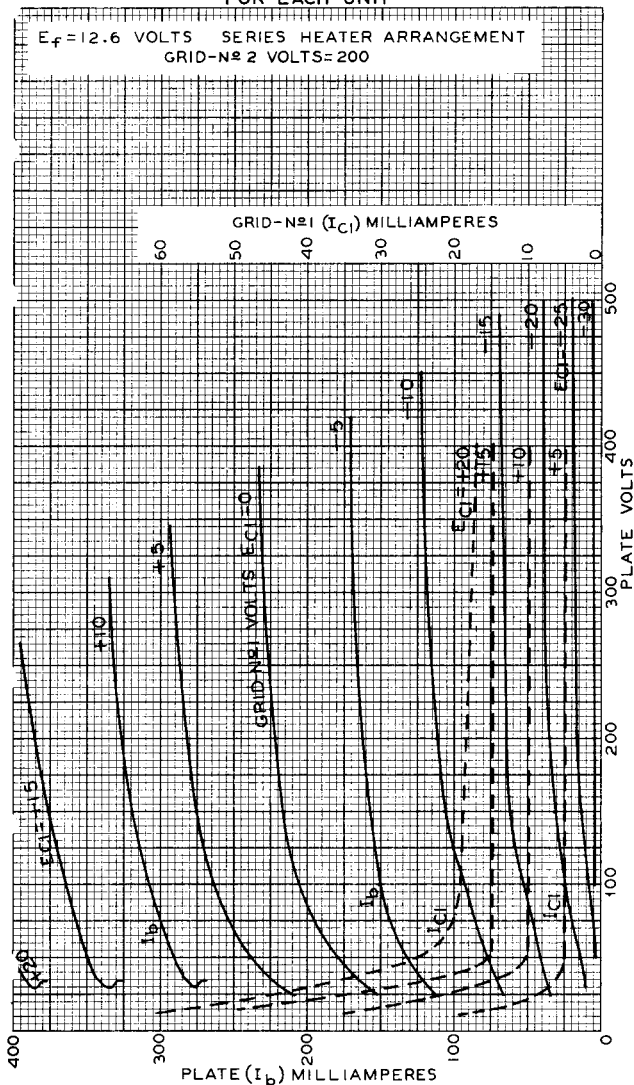
RADIO CORPORATION OF AMERICA HARRISON, NEW JERSEY



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AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT

$E_f = 12.6$ VOLTS SERIES HEATER ARRANGEMENT
GRID-Nº 2 VOLTS = 200



OCT. 4, 1944

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6205R1

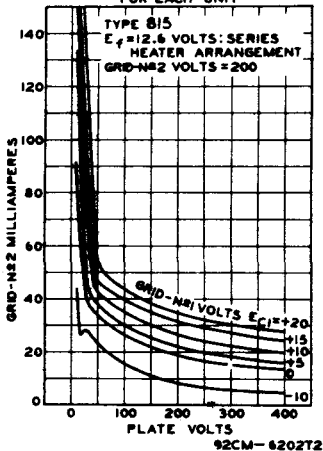
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PUSH-PULL R-F BEAM POWER AMPLIFIER

AVERAGE CHARACTERISTICS
FOR EACH UNIT



AVERAGE CHARACTERISTICS
FOR EACH UNIT

