850

SCREEN GRID R-F POWER AMPLIFIER

Filament	Thoriated Tungsten	
Voltage	10	a-c or d-c volts
Current	3.25	amp.
Amplification Factor	550 approx.	
Mutual Conductance for plate current of 19.5 ma.	2750	μmhos
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	0.25# max.	μμf
Input	17	μμf
Output	25	μμf
Maximum Overall Length		8-1/2"
Maximum Diameter		2-5/16"
Bulb		T-18
Cap		Medium Metal
Base		Jumbo 4-Large Pin

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage		1250 max.	volts
D-C Plate Current		150 max.	ma.
R-F Grid Current		6 max.	amp.
Plate Input		150 max.	watts
Screen Input		10 max.	watts
Plate Dissipation		100 max.	watts
Typical Operation:			
Filament Voltage	10	10	a-c volts
D-C Plate Voltage	1000	1250	volts
D-C Screen Voltage	175	175	volts
D-C Grid Voltage	-13	-13	volts
D-C Plate Current	100	110	ma.
Power Output	30	40	approx.watts

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage		1000 max.	volts
D-C Grid Voltage		-400 max.	volts
D-C Plate Current		150 max.	ma.
D-C Grid Current		40 max.	ma.
R-F Grid Current		6 max.	amp.
Plate Input		150 max.	watts
Screen Input		7 max.	watts
Plate Dissipation		70 max.	watts
Typical Operation:			
Filament Voltage	10	10	a-c volts
D-C Plate Voltage	750	1000	volts
D-C Screen Voltage	125	140	volts
D-C Grid Voltage	-100	-100	volts
D-C Plate Current	140	125	ma.
D-C Grid Current*	40	40	approx.ma.
Driving Power*	10	10	approx.watts
Power Output	50	65	approx.watts

With external shielding. (continued on next page)

* See next page.

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SCREEN GRID R-F POWER AMPLIFIER

(continued from preceding page)

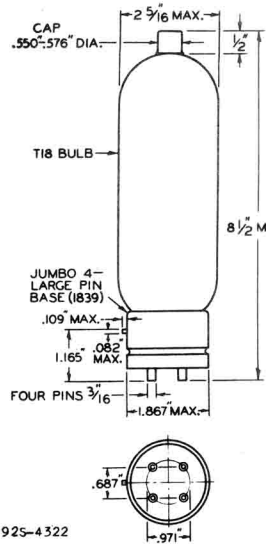
R-F POWER AMPLIFIER & OSCILLATOR – Class C Telegraphy

Key-down conditions per tube without modulation **

D-C Plate Voltage			1250 max.	volts
D-C Grid Voltage			-400 max.	volts
D-C Plate Current			175 max.	ma.
D-C Grid Current			40 max.	ma.
R-F Grid Current			7.5 max.	amp.
Plate Input			220 max.	watts
Screen Input			10 max.	watts
Plate Dissipation			100 max.	watts
Typical Operation:				
Filament Voltage	10	10	10	a-c volts
D-C Plate Voltage	750	1000	1250	volts
D-C Screen Voltage	175	175	175	volts
D-C Grid Voltage	-150	-150	-150	volts
D-C Plate Current	160	160	160	ma.
D-C Grid Current *	35	35	35	approx. ma.
Driving Power *	10	10	10	approx. watts
Power Output	55	100	130	approx. watts

* Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

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

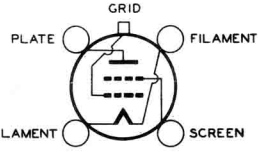


925-4322

BOTTOM VIEW OF BASE

For use of the 850 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS



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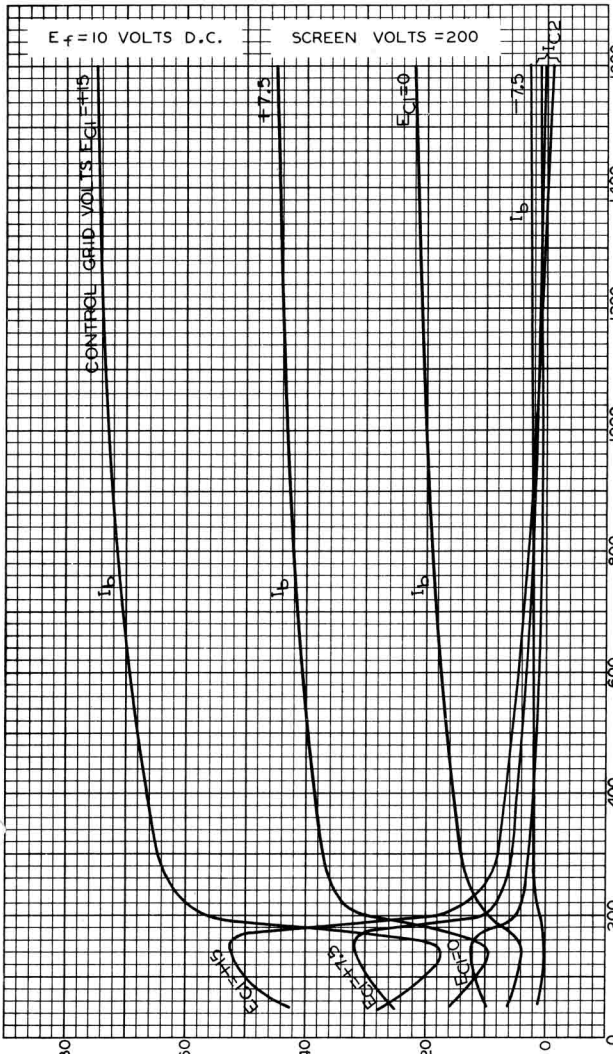
AVERAGE PLATE CHARACTERISTICS



RCA

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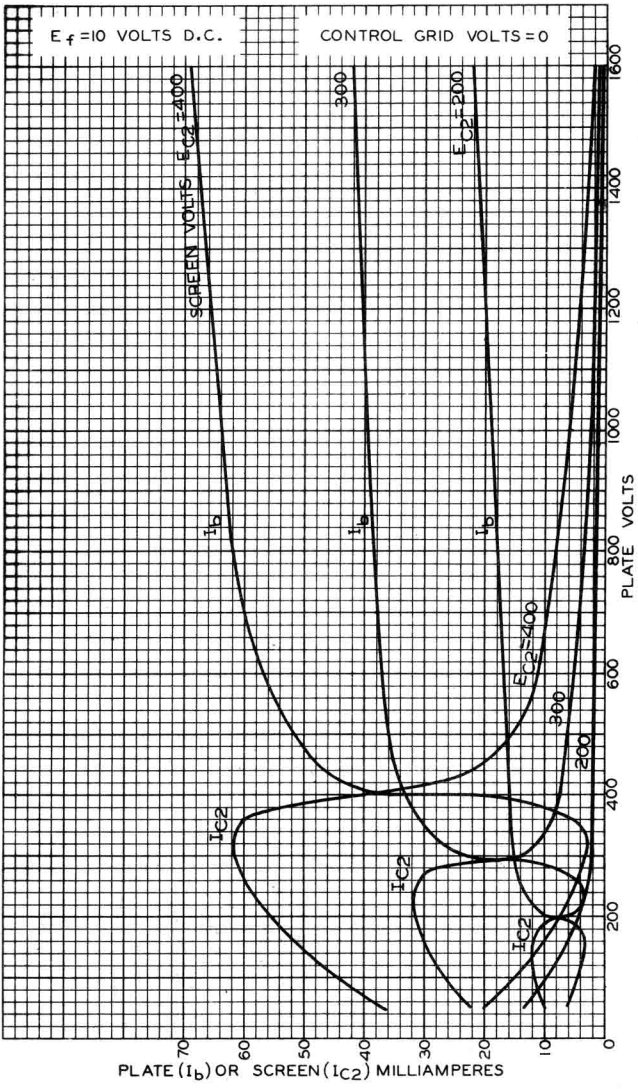
AVERAGE PLATE CHARACTERISTICS



850

SCREEN GRID R-F POWER AMPLIFIER

Filament	Thoriated Tungsten	
Voltage	10	a-c or d-c volts
Current	3.25	amp.
Amplification Factor	550 approx.	
Mutual Conductance for plate current of 19.5 ma.	2750 μmhos	
Direct Interelectrode Capacitances:		
Grid to Plate	0.25 maximum	μμf
Input	17	μμf
Output	25	μμf
Maximum Overall Length		8-1/2"
Maximum Diameter		2-5/16"
Bulb		T-18
Cap		Medium Metal
Base		Jumbo 4-Large Pin

R-F POWER AMPLIFIER - Class B (Telephony)

Carrier Conditions; for use with a Modulation Factor up to 1.0

D-C Plate Voltage		1250 max.	volts
D-C Plate Current		150 max.	ma.
Plate Dissipation		100 max.	watts
Screen Dissipation		10 max.	watts
R-F Grid Current		6 max.	amp.
Typical Operation:			
Filament Voltage	10	10	a-c volts
D-C Plate Voltage	1000	1250	volts
Screen Voltage	175	175	approx. volts
Grid Voltage	-13	-13	approx. volts
D-C Plate Current	100	110	ma.
Peak Power Output	120	160	approx. watts
Carrier Power Output	30	40	approx. watts

PLATE-MODULATED R-F POWER AMPLIFIER - Class C (Telephony)

Carrier Conditions; for use with a Modulation Factor up to 1.0

D-C Plate Voltage		1000 max.	volts
D-C Plate Current		150 max.	ma.
Plate Dissipation		70 max.	watts
Screen Dissipation		7 max.	watts
R-F Grid Current		6 max.	amp.
D-C Grid Current		40 max.	ma.
Typical Operation:			
Filament Voltage	10	10	a-c volts
D-C Plate Voltage	750	1000	volts
Screen Voltage	125	140	approx. volts
Grid Voltage	-100	-100	approx. volts
D-C Plate Current	140	125	ma.
D-C Grid Current*	40	40	ma.
Driving Power*	10	10	watts
Power Output	50	65	approx. watts

* See next page.

(continued on next page)

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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SCREEN GRID R-F POWER AMPLIFIER

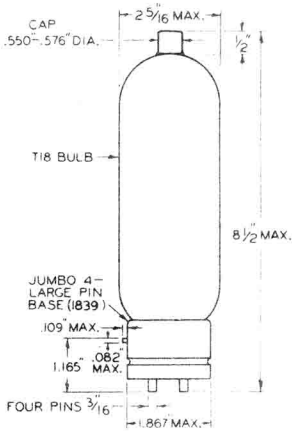
(continued from preceding page)

R-F POWER AMPLIFIER & OSCILLATOR - Class C (Telegraphy)

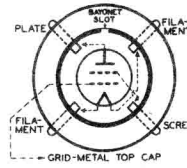
Key-down Conditions

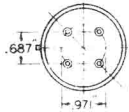
D-C Plate Voltage			1250	max.	volts
D-C Plate Current			175	max.	ma.
Plate Input			220	max.	watts
Plate Dissipation			100	max.	watts
Screen Dissipation			10	max.	watts
R-F Grid Current			7.5	max.	amp.
D-C Grid Current			40	max.	ma.
Typical Operation:					
Filament Voltage	10	10	10	a-c	volts
D-C Plate Voltage	750	1000	1250		volts
Screen Voltage	175	175	175	approx.	volts
Grid Voltage	-150	-150	-150	approx.	volts
D-C Plate Current	160	160	160		ma.
D-C Grid Current*	35	35	35		ma.
Driving Power*	10	10	10		watts
Power Output	55	100	130	approx.	watts

* Subject to wide variations depending on the impedance of the load circuit. High impedance load circuits require more grid current and driving power to obtain the desired output. Low impedance circuits need less grid current and driving power, but plate circuit efficiency is sacrificed. The driving stage should have a tank circuit of good regulation and should be capable of delivering considerably more than the required driving power.



TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS





BOTTOM VIEW OF BASE

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR

Filament	Thoriated Tungsten	
Voltage	11	a-c or d-c volts
Current	15.5	amp.
Amplification Factor	20.5	
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	47	μμf
Grid to Filament	25.5	μμf
Plate to Filament	4.5	μμf
Overall Length		17-1/2" ± 1/8"
Maximum Diameter		6-1/8"
Bulb		T-48
Cap		No.1902
Base		No.3117

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

A-F POWER AMPLIFIER & MODULATOR - Class A

D-C Plate Voltage			2500 max.	volts
Plate Dissipation			600 max.	watts
Typical Operation:				
Filament Voltage	11	11	11	a-c volts
D-C Plate Voltage	1500	2000	2500	volts
D-C Grid Voltage	-49	-65	-92	volts
Peak A-F Grid Voltage	44	60	87	volts
D-C Plate Current	175	270	240	ma.
Plate Resistance	1800	1500	1600	ohms
Load Resistance	3700	3100	5000	ohms
Power Output	46	100	160	watts

A-F POWER AMPLIFIER & MODULATOR - Class B

D-C Plate Voltage			3000 max.	volts
Max-Signal D-C Plate Current*			1 max.	amp.
Max-Signal Plate Input*			2250 max.	watts
Plate Dissipation*			750 max.	watts
Typical Operation - 2 tubes:				
Unless otherwise specified, values are for 2 tubes.				
Filament Voltage	11	11	11	a-c volts
D-C Plate Voltage	2000	2500	3000	volts
D-C Grid Voltage	-85	-111	-135	volts
Peak A-F Grid-to-Grid Volt.	500	490	490	volts
Zero-Signal D-C Plate Cur.	0.12	0.12	0.11	amp.
Max-Signal D-C Plate Cur.	1.7	1.4	1.2	amp.
Load Resistance (per tube)	650	1000	1400	ohms
Effective Load Resistance (plate to plate)	2600	4000	5600	ohms
Max-Signal Driving Power	20	12	6	approx.watts
Max-Signal Power Output	2.2	2.3	2.4	approx.kw

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

← Indicates a change

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MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR

(continued from preceding page)

R-F POWER AMPLIFIER – Class B Telephony

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

D-C Plate Voltage			2500	max.	volts
D-C Plate Current			0.75	max.	amp.
R-F Grid Current			8	max.	amp.
Plate Input			1100	max.	watts
Plate Dissipation			750	max.	watts
Typical Operation:					
Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	1500	2000	2500		volts
D-C Grid Voltage	-60	-85	-110		volts
→ Peak R-F Grid Voltage	150	140	135		volts
D-C Plate Current	0.62	0.475	0.39		amp.
Driving Power ** °	40	25	20	approx.	watts
Power Output	275	300	325	approx.	watts

° At crest of a-f cycle with modulation factor of 1.0.

PLATE-MODULATED R-F POWER AMPLIFIER – Class C Telephony

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

D-C Plate Voltage			2000	max.	volts
D-C Grid Voltage			-500	max.	volts
D-C Plate Current			1	max.	amp.
D-C Grid Current			0.2	max.	amp.
R-F Grid Current			8	max.	amp.
Plate Input			1800	max.	watts
Plate Dissipation			500	max.	watts
Typical Operation:					
Filament Voltage		11	11	a-c	volts
D-C Plate Voltage		1500	2000		volts
D-C Grid Voltage		-250	-300		volts
Peak R-F Grid Voltage		475	525		volts
D-C Plate Current		0.9	0.85		amp.
D-C Grid Current **		0.15	0.125	approx.	amp.
Driving Power **		75	65	approx.	watts
Power Output		900	1250	approx.	watts

R-F POWER AMPLIFIER & OSCILLATOR – Class C Telegraphy

*Key-down conditions per tube without modulation**

D-C Plate Voltage			2500	max.	volts
→ D-C Grid Voltage			-500	max.	volts
D-C Plate Current			1	max.	amp.
D-C Grid Current			0.2	max.	amp.
R-F Grid Current			10	max.	amp.
Plate Input			2500	max.	watts
Plate Dissipation			750	max.	watts
Typical Operation:					
Filament Voltage	11	11	11	a-c	volts
D-C Plate Voltage	1500	2000	2500		volts

*, ** See next page.

← Indicates a change

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MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR

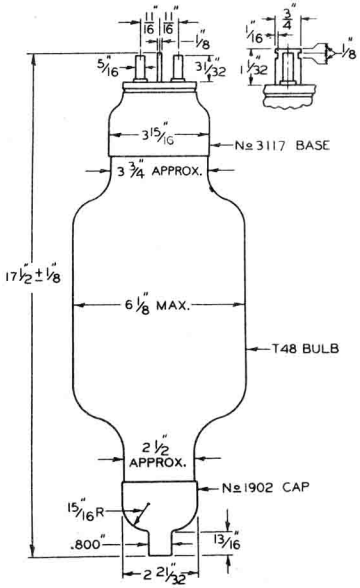
(continued from preceding page)

D-C Grid Voltage	-150	-200	-250	approx.volts
Peak R-F Grid Voltage	375	425	450	approx.volts
D-C Plate Current	0.9	0.9	0.9	amp.
D-C Grid Current **	0.15	0.12	0.1	approx.amp.
Driving Power **	55	50	45	approx.watts
Power Output	900	1250	1700	approx.watts

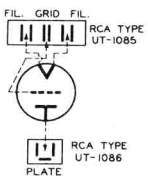
** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

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

For use of the 851 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.



TUBE SYMBOL & CONNECTIONS TO END-MOUNTINGS.



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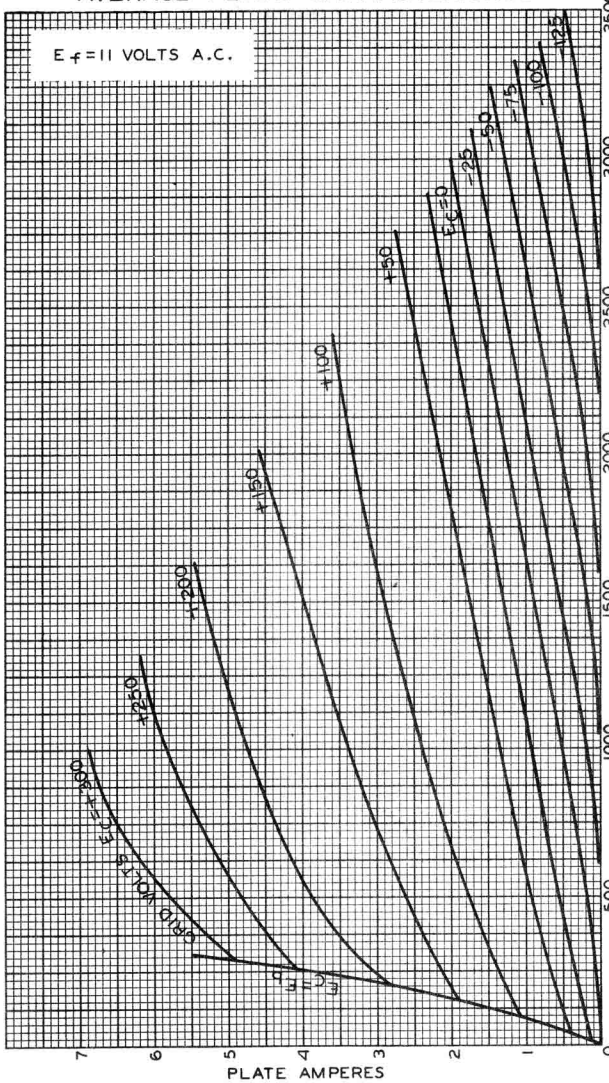
AVERAGE PLATE CHARACTERISTICS



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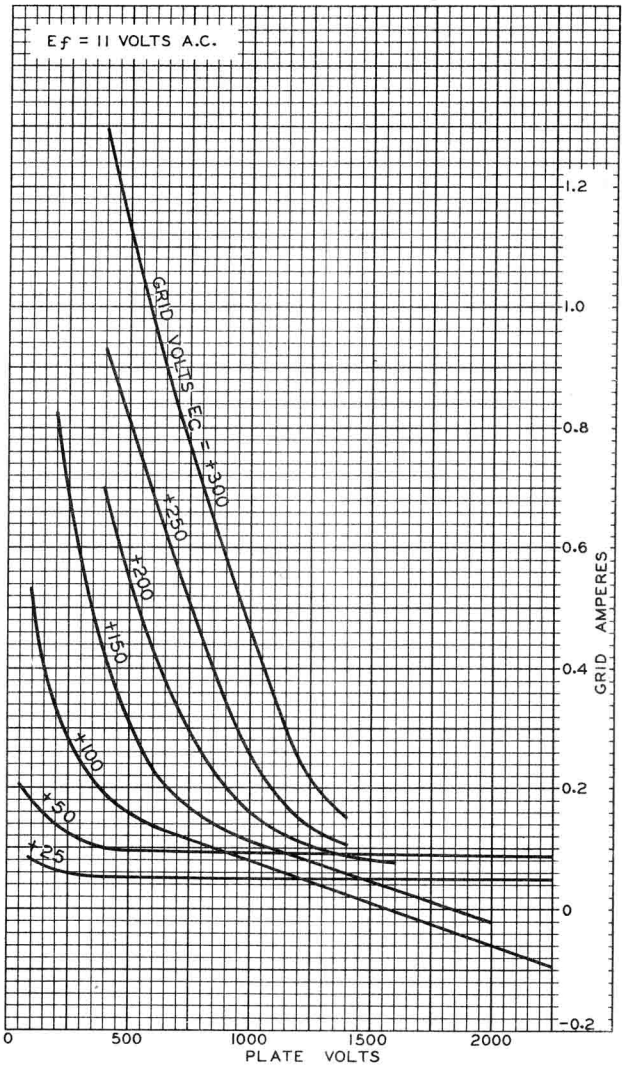
TYPICAL CHARACTERISTICS



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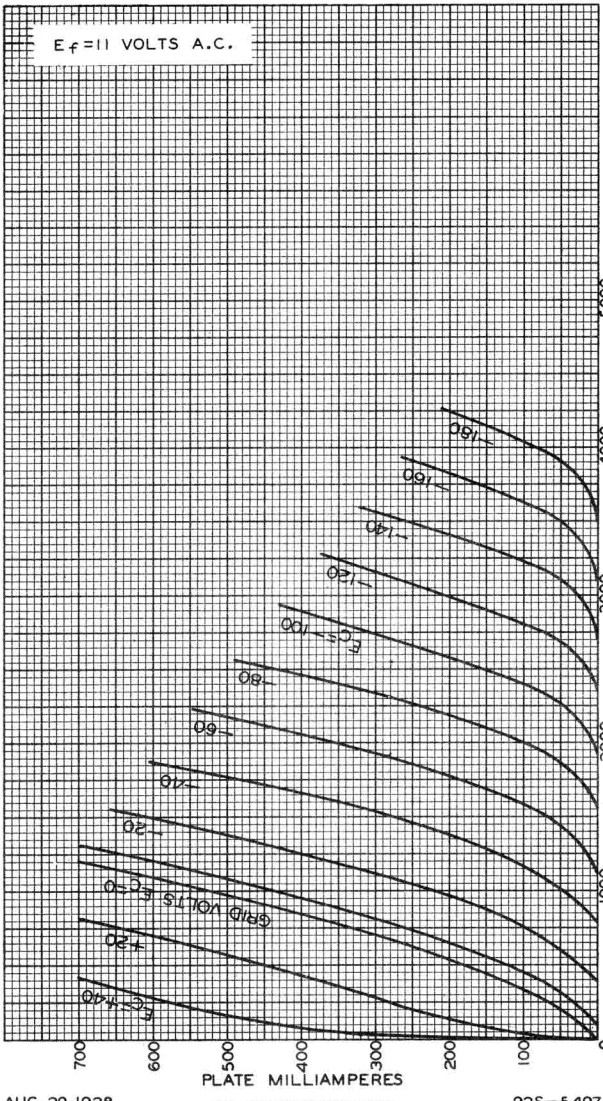
AVERAGE PLATE CHARACTERISTICS



AUG. 29, 1928

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RCA MANUFACTURING COMPANY, INC.

925—5497

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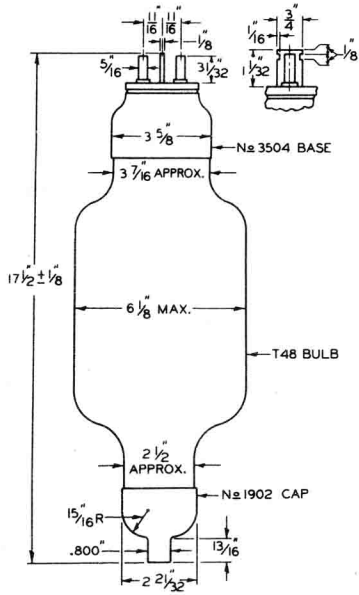
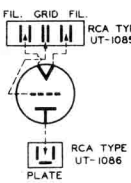
MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR

(continued from preceding page)



TUBE SYMBOL & CONNECTIONS
TO END-MOUNTINGS



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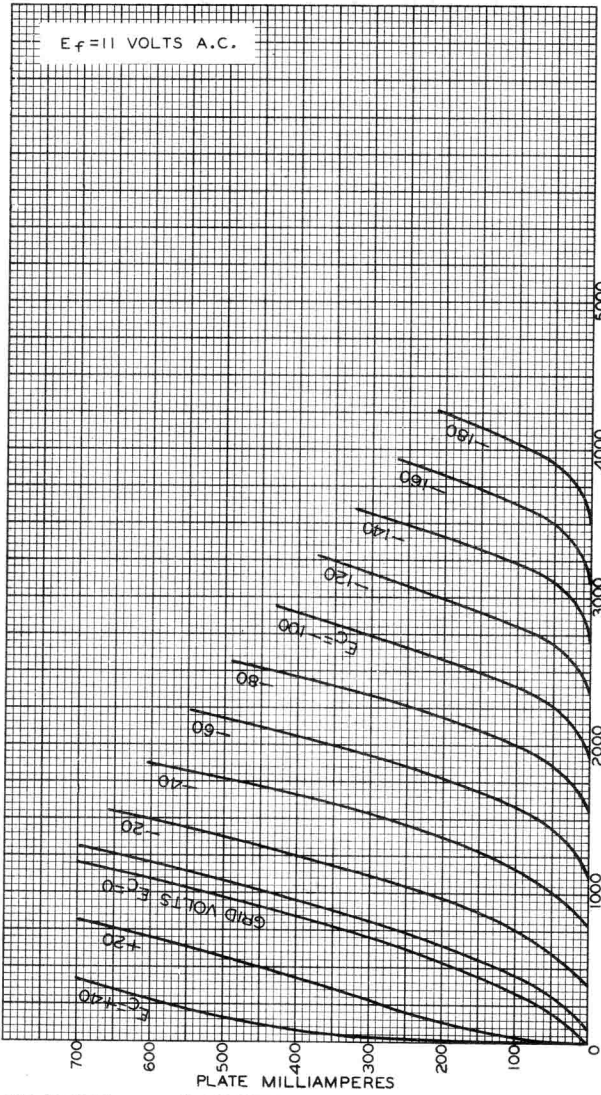
AVERAGE PLATE CHARACTERISTICS



AUG. 29, 1928

RCA RADIOTRON COMPANY, INC.

925—5497

RCA

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MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR

Filament	Thoriated Tungsten	
Voltage	11	a-c or d-c volts
Current	15.5	amp.
Amplification Factor	20.5	
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	47	μμf
Grid to Filament	25.5	μμf
Plate to Filament	4.5	μμf
Overall Length		17-1/2"±1/8"
Maximum Diameter		6-1/8"
Bulb		T-48
Cap		No. 1902
Base		No. 3504

A-F POWER AMPLIFIER & MODULATOR - Class A

D-C Plate Voltage	2500 max.	volts
Plate Dissipation	600 max.	watts
Typical Operation:		
Filament Voltage	11	a-c volts
D-C Plate Voltage	2000	volts
Grid Voltage	-65	volts
Peak Grid Swing	60	volts
D-C Plate Current	270	ma.
Load Resistance	3100	ohms
U.P.O. (5% second harmonic)	100	watts

A-F POWER AMPLIFIER & MODULATOR - Class B

D-C Plate Voltage	3000 max.	volts
D-C Plate Current (Averaged over any audio-frequency cycle)	1.0 max.	amp.
Plate Dissipation (Averaged over any audio-frequency cycle)	750 max.	watts
Plate Input	2250 max.	watts

Typical Operation (2 tubes):

Filament Voltage	11	11	11	a-c volts
D-C Plate Voltage	2000	2500	3000	volts
Grid Voltage	-85	-111	-135	approx. volts
Zero-Sig. Plate Cur. (per tube)	60	60	55	ma.
Max.-Sig. Plate Cur. (per tube)	850	680	570	ma.
Load Resistance (per tube)	650	1020	1480	ohms
Effective Load Res. (plate to plate)	2600	4080	5920	ohms
Power Output (2 tubes)	2200	2200	2200	approx. watts

R-F POWER AMPLIFIER - Class B (Telephony)

(Carrier Conditions; for use with a Modulation Factor up to 1.0)

D-C Plate Voltage	2500 max.	volts
D-C Plate Current	750 max.	ma.
Plate Dissipation	750 max.	watts
R-F Grid Current	8 max.	amp.
Typical Operation:		
Filament Voltage	11	a-c volts

(continued on next page)

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MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR

(continued from preceding page)

D-C Plate Voltage	2000	volts
Grid Voltage	-85 approx.	volts
D-C Plate Current	475	ma.
Peak Power Output	1200 approx.	watts
Carrier Power Output	300 approx.	watts

PLATE-MODULATED R-F POWER AMPLIFIER - Class C (Telephony)

(Carrier Conditions; for use with a Modulation Factor up to 1.0)

D-C Plate Voltage	2000 max.	volts
D-C Plate Current	1.0 max.	amp.
Plate Dissipation	500 max.	watts
R-F Grid Current	8 max.	amp.
D-C Grid Current	200 max.	ma.
Typical Operation:		
Filament Voltage	11 a-c	volts
D-C Plate Voltage	1800	volts
Grid Voltage	-350 approx.	volts
D-C Plate Current	450	ma.
Power Output	1000 approx.	watts

R-F POWER AMPLIFIER & OSCILLATOR - Class C (Telegraphy)

(Key-down Conditions)

D-C Plate Voltage	2500 max.	volts
D-C Plate Current	1.0 max.	amp.
Plate Dissipation	750 max.	watts
R-F Grid Current	10 max.	amp.
D-C Grid Current	200 max.	ma.
Typical Operation:		
Filament Voltage	11 a-c	volts
D-C Plate Voltage	2000	volts
Grid Voltage	-200 approx.	volts
D-C Plate Current	900	ma.
Power Output	1250 approx.	watts

(continued on next page)

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R-F POWER AMPLIFIER, OSCILLATOR

Filament	Thoriated Tungsten	
Voltage	10	a-c or d-c volts
Current	3.25	amp.
Amplification Factor	12	
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	2.6	μμf
Grid to Filament	1.9	μμf
Plate to Filament	1.0	μμf
Maximum Overall Length		8-3/4"
Maximum Radius		4-1/4"
Bulb		GT-30 with arm
Base		Medium 4-Pin Bayonet

A-F POWER AMPLIFIER & MODULATOR - Class B

D-C Plate Voltage		3000 max.	volts
Max.-Sig. D-C Plate Cur.*		100 max.	ma.
Max.-Sig. Plate Input*		250 max.	watts
Plate Dissipation*		100 max.	watts
Typical Operation (2 tubes):			
Unless otherwise specified, values are for 2 tubes.			
Filament Voltage	10	10	a-c volts
D-C Plate Voltage	2000	3000	volts
D-C Grid Voltage	-155	-250	volts
Peak A-F Grid Voltage	600	780	volts
Zero-Sig. D-C Plate Cur.	22	14	ma.
Max.-Sig. D-C Plate Cur.	180	160	ma.
Load Resistance (per tube)	5500	10250	ohms
Effective Load Res. (plate to plate)	22000	41000	ohms
Max.-Sig. Driving Power	3.5	3.5	approx.watts
Max.-Sig. Power Output	220	320	approx.watts

* Averaged over any audio-frequency cycle.

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage		3000 max.	volts
D-C Plate Current		85 max.	ma.
R-F Grid Current		8.0 max.	amp.
Plate Input		150 max.	watts
Plate Dissipation		100 max.	watts
Typical Operation:			
Filament Voltage	10	10	a-c volts
D-C Plate Voltage	2000	3000	volts
D-C Grid Voltage	-155	-250	volts
Peak R-F Grid Voltage	200	225	volts
D-C Plate Current	60	43	ma.
D-C Grid Current**	1	0	approx.ma.
Driving Power ° **	10	7	approx.watts
Power Output	30	40	approx.watts

° At crest of a-f cycle

** See next page.

(continued on next page)

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R-F POWER AMPLIFIER, OSCILLATOR

(continued from preceding page)

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage		2000 max.		volts
D-C Grid Voltage		-800 max.		volts
D-C Plate Current		85 max.		ma.
D-C Grid Current		40 max.		ma.
R-F Grid Current		8.0 max.		amp.
Plate Input		170 max.		watts
Plate Dissipation		67 max.		watts
Typical Operation:				
Filament Voltage	10	10	a-c	volts
D-C Plate Voltage	1500	2000		volts
D-C Grid Voltage	-400	-500		volts
Peak R-F Grid Voltage	650	750		volts
D-C Plate Current	70	67		ma.
D-C Grid Current **	30	30	approx.	ma.
Driving Power **	20	23	approx.	watts
Power Output	45	75	approx.	watts

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down Conditions per tube without modulation#

D-C Plate Voltage		3000 max.		volts
D-C Grid Voltage		-800 max.		volts
D-C Plate Current		150 max.		ma.
D-C Grid Current		40 max.		ma.
R-F Grid Current		10 max.		amp.
Plate Input		300 max.		watts
Plate Dissipation		100 max.		watts
Typical Operation:				
Filament Voltage	10	10	a-c	volts
D-C Plate Voltage	2500	3000		volts
D-C Grid Voltage	-450	-600		volts
Peak R-F Grid Voltage	700	850		volts
D-C Plate Current	90	85		ma.
D-C Grid Current **	15	15	approx.	ma.
Driving Power **	10	12	approx.	watts
Power Output	135	165	approx.	watts

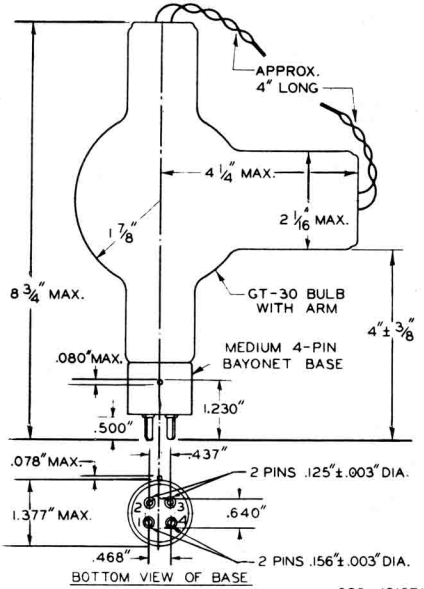
Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

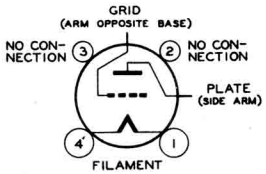
For use of the 852 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY

852

R-F POWER AMPLIFIER, OSCILLATOR



TUBE SYMBOL & TOP VIEW
OF
SOCKET CONNECTIONS



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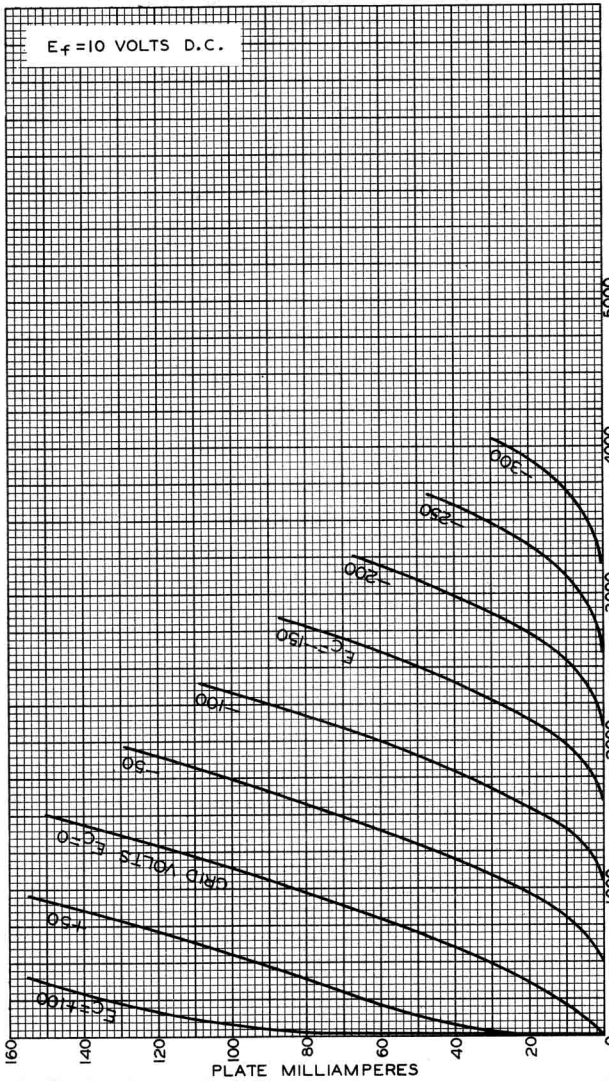
AVERAGE PLATE CHARACTERISTICS



MAR. 2, 1931

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925-582R3

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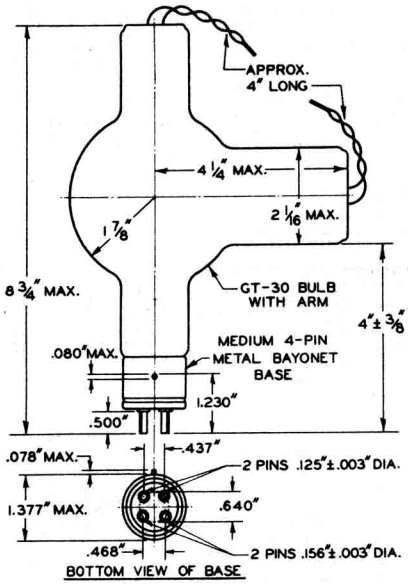
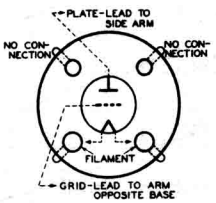
OSCILLATOR, R-F POWER AMPLIFIER

(continued from preceding page)



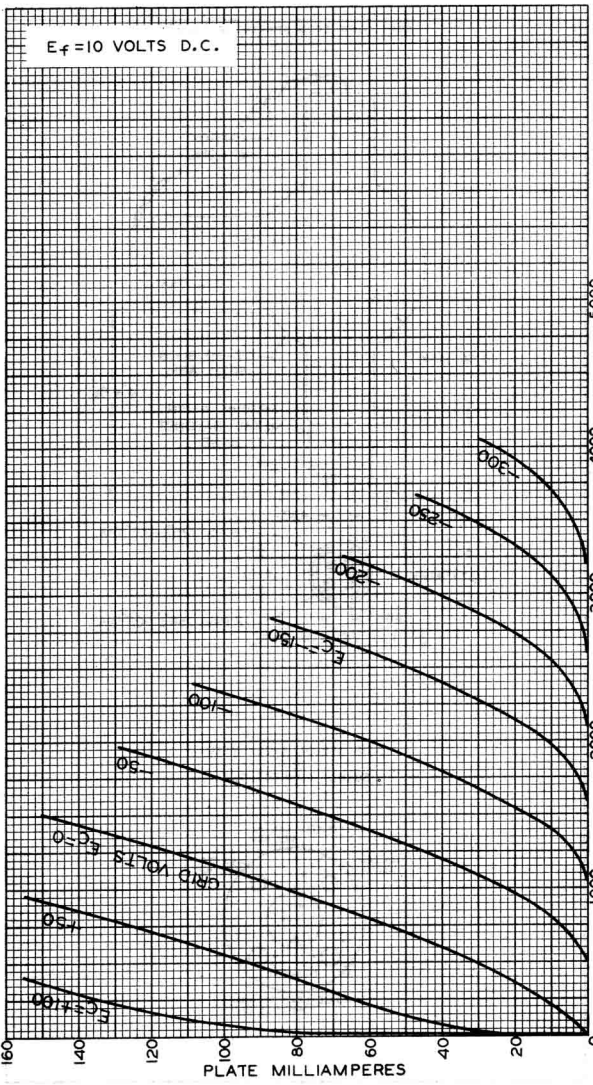
TUBE SYMBOL & TOP VIEW
OF
SOCKET CONNECTIONS



852

852/552

AVERAGE PLATE CHARACTERISTICS



857

HALF-WAVE MERCURY-VAPOR RECTIFIER

Heater	Coated Unipotential Cathode *	
Voltage	5	a-c volts
Current	30	amp.
Overall Length		19-1/2" ± 3/8"
Maximum Diameter		7-1/8"
Bulb		GT-56
Cap		No.1904
Base #		No.3911

MAXIMUM RATINGS

Peak Inverse Voltage: *Supply Freq.*	*Condensed Mercury Temperature Range*	
Up to 150~	25° - 65°C	10000 max. volts
Up to 150~	30° - 40°C	22000 max.** volts
Peak Plate Current		40 max. amp.
Average Plate Current {Averaged over period of 30 sec.}		10 max. amp.
Tube Voltage Drop		10 approx. volts

* The cathode should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately 10 minutes.

\# Base shell is connected within base to cathode lead.

** For plate potentials in excess of 10000 volts peak inverse, temperature-regulated forced-air cooling must be employed.

For *shielding and r-f filter circuits, refer to Type 871.*

The table below classifies suitable rectifier circuits for the 857 and shows their safe maximum input and maximum output operating conditions for a peak inverse voltage of 22000 volts. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit. If the 857 is to be used under temperature conditions such that the peak inverse voltage is limited to 10000 volts, the a-c input voltage and d-c output voltage values in the table should be multiplied by a factor of 0.45 to give the maximum values for the 10000-volt conditions.

CIRCUIT	MAXIMUM A-C INPUT VOLTS□ (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1	7750 per tube	7000	20
SINGLE-PHASE FULL-WAVE (4 tubes) FIG.2	15500 total	14000	20
THREE-PHASE HALF-WAVE FIG.3	9000 per leg	10500	30
THREE-PHASE DOUBLE-Y PARALLEL FIG.4	9000 per leg	10500	60
THREE-PHASE FULL-WAVE FIG.5	9000 per leg	21000	30

□ For maximum peak inverse voltage of 22000 volts.

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RCA MANUFACTURING COMPANY, INC.

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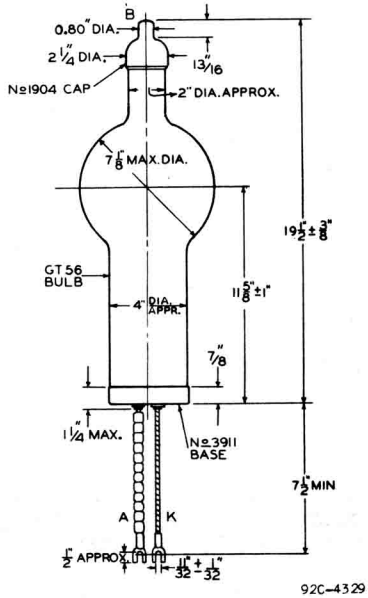
HALF-WAVE MERCURY-VAPOR RECTIFIER



TUBE SYMBOL
AND
TERMINAL CONNECTIONS

A - Heater
K - Cathode & Heater
B - Plate

NOTE: Special end-mountings are required.

RCA
857

HALF-WAVE MERCURY-VAPOR RECTIFIER

Heater	Coated Uni-potential Cathode*	
Voltage	5	a-c volts
Current	30	amp.
Overall Length		19-1/2" ± 3/8"
Maximum Diameter		7-1/8"
Bulb		GT-56
Cap		No. 1904
Base#		No. 3911

Peak Inverse Voltage:

Supply Freq.	*Ambient Temp. Range*	
Up to 150~	15° - 50°C	10000 max. volts
Up to 150~	30° - 40°C	22000 max.** volts
Peak Plate Current		40 max. amp.
Average Plate Current	(Averaged over period of 30 sec.)	10 max. amp.
Tube Voltage Drop		10 approx. volts

* The cathode should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately 10 minutes.

\# Base shell is connected within base to cathode lead.

** For plate potentials in excess of 10000 volts peak inverse, temperature-regulated forced-air cooling must be employed.

For *shielding and r-f filter circuits*, refer to Type 871.

The table below classifies suitable rectifier circuits for the 857 and shows their safe maximum input and maximum output operating conditions for a peak inverse voltage of 22000 volts. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit. If the 857 is to be used under temperature conditions such that the peak inverse voltage is limited to 10000 volts, the a-c input voltage and d-c output voltage values in the table should be multiplied by a factor of 0.45 to give the maximum values for the 10000-volt conditions.

For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS□ (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	7750 per tube	7000	20
SINGLE-PHASE FULL-WAVE (4 tubes) FIG. 2	15500 total	14000	20
THREE-PHASE HALF-WAVE FIG. 3	9000 per leg	10500	30
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	9000 per leg	10500	60
THREE-PHASE FULL-WAVE FIG. 5	9000 per leg	21000	30

□ For maximum peak inverse voltage of 22000 volts.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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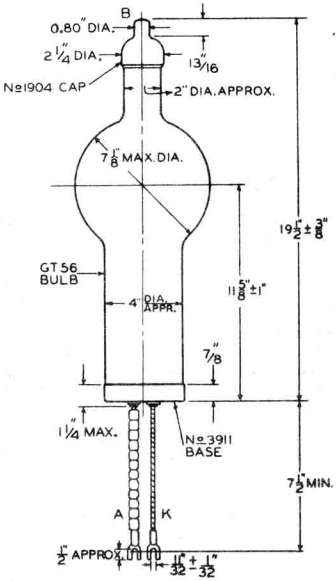
HALF-WAVE MERCURY-VAPOR RECTIFIER



TUBE SYMBOL
AND
TERMINAL CONNECTIONS

A - Heater
K - Cathode & Heater
B - Plate

NOTE: Special end-mountings are required.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

857-B

HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament*	Coated	
Voltage	5	a-c volts
Current	30	amp.
Overall Length		19-1/2" ± 3/8"
Maximum Diameter		7-1/8"
Bulb		GT-56
Cap		No.1904
Base #		No.3911

MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temperature Range*		
Up to 150~	25° - 60°C	10000 max.	volts
Up to 150~	30° - 40°C	22000 max.**	volts
Peak Plate Current		40 max.	amp.
Average Plate Current	{*Averaged over period of 30 sec.}	10 max.	amp.
Peak Tube Voltage Drop		14 approx.	volts

* The filament should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately one minute.

\# Base shell is connected within base to one side of the filament (uninsulated side).

** For peak inverse voltages in excess of 10000 volts, temperature-regulated forced-air cooling must be employed.

For *Circuits*, refer to 92S-4315, backing Type 872.

For *shielding and r-f filter circuits*, refer to Type 871.

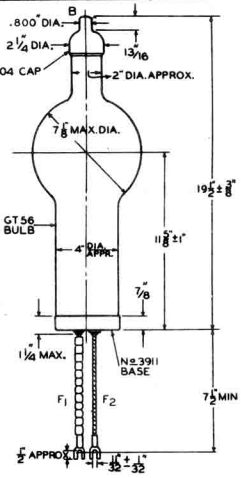
The table below classifies suitable rectifier circuits for the 857-B and shows their safe maximum input and maximum output operating conditions for a peak inverse voltage of 22000 volts. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit. If the 857-B is to be used under temperature conditions such that the peak inverse voltage is limited to 10000 volts, the a-c input voltage and d-c output voltage values in the table should be multiplied by a factor of 0.45 to give the maximum values for the 10000-volt conditions.

CIRCUIT	MAXIMUM A-C INPUT VOLTS□ (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	7000 per tube	6300	20
SINGLE-PHASE FULL-WAVE (4-tubes) FIG. 2	14000 total	12600	20
THREE-PHASE HALF-WAVE FIG. 3	8250 per leg	9600	30
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	8250 per leg	9600	60
THREE-PHASE FULL-WAVE FIG. 5	8250 per leg	19200	30

For maximum peak inverse voltage of 22000 volts.

857-B

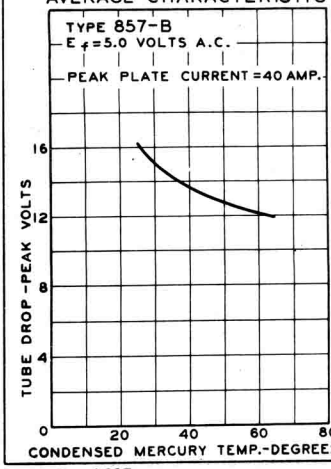
HALF-WAVE MERCURY VAPOR RECTIFIER



B = PLATE
F_1 = FILAMENT
F_2 = FILAMENT (PLATE RETURN)

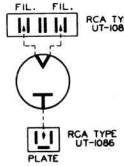
92C-4649

AVERAGE CHARACTERISTIC



92C-4651

TUBE SYMBOL & CONNECTIONS TO END-MOUNTINGS



JAN. 15, 1937

TENTATIVE DATA

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

858

OSCILLATOR, R-F POWER AMPLIFIER

(WATER COOLED)

Filament	Tungsten		
Voltage	22	a-c or d-c	volts
Current	52		amp.
Amplification Factor	42		
Direct Interelectrode Capacitances (approx.):			
Grid to Plate	18		μμf
Grid to Filament	16		μμf
Plate to Filament	2		μμf
Maximum Overall Length			24-1/2"
Maximum Radius			7-1/2"
Base			None
Water Jacket			UT-1290

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

This tube can often be operated with reduced filament voltage as explained on sheet TYPES OF CATHODES in front of book.

A-F POWER AMPLIFIER - Class B

D-C Plate Voltage	20000 max.	volts
Max-Signal D-C Plate Current *	2.0 max.	amp.
Max-Signal D-C Plate Input *	40 max.	kw
Plate Dissipation *	20 max.	kw
Typical Operation - 2 tubes:		
Unless otherwise specified, values are for 2 tubes.		
Filament Voltage	22	d-c volts
D-C Plate Voltage	12000	volts
D-C Grid Voltage	-140	volts
Peak A-F Grid-to-Grid Voltage	2600	volts
Zero-Signal D-C Plate Cur.	0.5	amp.
Max-Signal D-C Plate Cur.	3.6	amp.
Load Resistance (per tube)	1800	ohms
Effective Load Res. (plate to plate)	7200	ohms
Max-Signal Driving Power	115	approx. watts
Max-Signal Power Output	26.5	approx. kw

* Averaged over any audio-frequency cycle.

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage			20000 max.	volts
D-C Plate Current			1.0 max.	amp.
R-F Grid Current			48 max.	amp.
Plate Input			20 max.	kw
Plate Dissipation			15 max.	kw
Typical Operation:				
Filament Voltage	22	22	22	d-c volts
D-C Plate Voltage	10000	14000	18000	volts
D-C Grid Voltage	-100	-200	-300	volts
Peak R-F Grid Voltage	400	575	725	volts
D-C Plate Current	0.5	0.7	0.9	amp.

(continued on next page)

858
OSCILLATOR, R-F POWER AMPLIFIER

(continued from preceding page)

Driving Power ** °	25	70	85	approx. watts
Power Output	1.5	3.3	5.6	approx. kw

° At crest of a-f cycle with modulation factor of 1.0.

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage			12000 max.	volts
D-C Grid Voltage			-3000 max.	volts
D-C Plate Current			1.0 max.	amp.
D-C Grid Current			0.25 max.	amp.
R-F Grid Current			48 max.	amp.
Plate Input			12 max.	kw
Plate Dissipation			10 max.	kw
Typical Operation:				
Filament Voltage	22	22	22 a-c	volts
D-C Plate Voltage	8000	10000	12000	volts
D-C Grid Voltage	-900	-950	-1000	volts
Peak R-F Grid Voltage	1875	1950	1950	volts
D-C Plate Current	0.90	0.90	0.95	amp.
D-C Grid Current **	0.10	0.09	0.08	approx. amp.
Driving Power **	180	200	150	approx. watts
Power Output	5	6	8	approx. kw

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation #

D-C Plate Voltage			20000 max.	volts
D-C Grid Voltage			-3000 max.	volts
D-C Plate Current			2.0 max.	amp.
D-C Grid Current			0.25 max.	amp.
R-F Grid Current			60 max.	amp.
Plate Input			40 max.	kw
Plate Dissipation			20 max.	kw
Typical Operation:				
Filament Voltage	22	22	22 a-c	volts
D-C Plate Voltage	10000	15000	18000	volts
D-C Grid Voltage	-1000	-1100	-1200	volts
Peak R-F Grid Voltage	2200	2500	2600	volts
D-C Plate Current	1.4	1.8	1.8	amp.
D-C Grid Current **	0.13	0.10	0.10	approx. amp.
Driving Power **	275	250	250	approx. watts
Power Output	9	18	22.4	approx. kw

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

** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

For use of the 858 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

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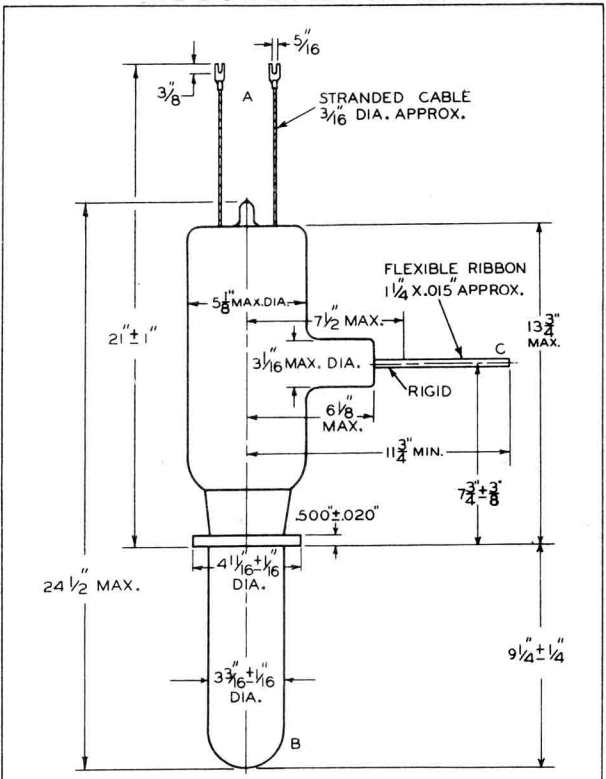
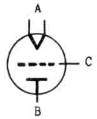
858
OSCILLATOR, R-F POWER AMPLIFIER



TUBE SYMBOL AND TERMINAL CONNECTIONS



A – Filament
B – Plate
C – Grid

858

858
OSCILLATOR, R-F POWER AMPLIFIER

THE FILAMENT CHARACTERISTIC AND THE FILAMENT EMISSION CHARACTERISTIC FOR THE 858 ARE THE SAME AS THOSE SHOWN FOR THE 207.

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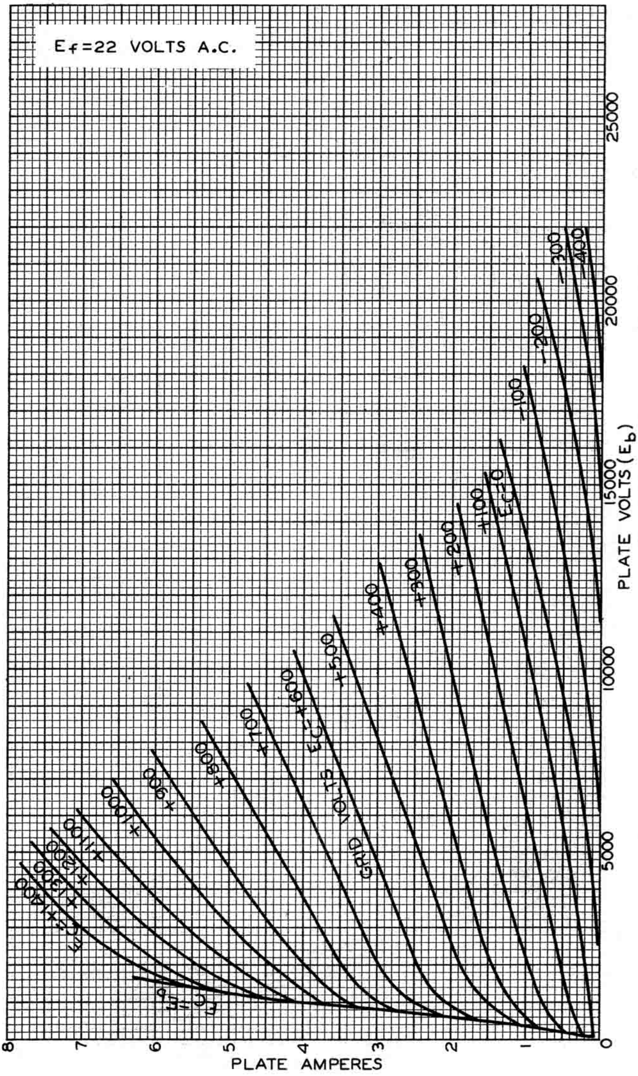
AVERAGE PLATE CHARACTERISTICS



RCA

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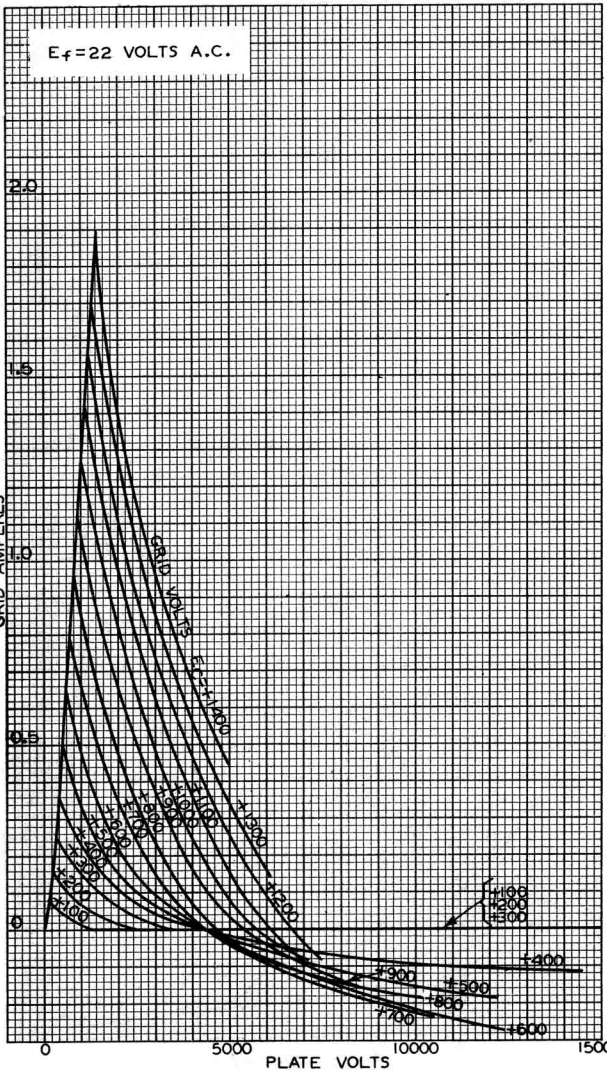
TYPICAL CHARACTERISTICS



860

SCREEN GRID R-F POWER AMPLIFIER

Filament	Thoriated Tungsten	
Voltage	10	a-c or d-c volts
Current	3.25	amp.
Amplification Factor	200 approx.	
Transconductance for plate current of 50 ma.	1100	μmhos
Direct Interelectrode Capacitances:		
Grid to Plate	0.08* max.	μμf
Input	7.75	μμf
Output	7.5	μμf
Maximum Overall Length		8-3/4"
Maximum Radius		4-1/4"
Bulb		GT-30 with arm
Base	Medium 4-Pin Ceramic, Bayonet	

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage			3000 max.	volts
D-C Plate Current			85 max.	ma.
R-F Grid Current			8 max.	amp.
Screen Input			10 max.	watts
Plate Dissipation			100 max.	watts
Typical Operation:				
Filament Voltage	10	10		a-c volts
D-C Plate Voltage	2000	3000		volts
D-C Screen Voltage	300	300		volts
D-C Grid Voltage	-50	-50		volts
D-C Plate Current	60	43		ma.
Power Output	30	40		approx. watts

° At crest of a-f cycle with modulation factor of 1.0.

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage			2000 max.	volts
D-C Grid Voltage			-800 max.	volts
D-C Plate Current			85 max.	ma.
D-C Grid Current			40 max.	ma.
R-F Grid Current			8 max.	amp.
Plate Input			170 max.	watts
Screen Input			6.7 max.	watts
Plate Dissipation			67 max.	watts
Typical Operation:				
Filament Voltage	10	10	10	a-c volts
D-C Plate Voltage	1500	1800	2000	volts
D-C Screen Voltage	300	300	300	volts
D-C Grid Voltage	-225	-225	-225	volts
D-C Plate Current	70	67	67	ma.
D-C Grid Current **	30	30	30	approx. ma.

* With external shielding.

** See next page.

(continued on next page)

860

SCREEN GRID R-F POWER AMPLIFIER

(continued from preceding page)

Driving Power **	15	15	15		approx.watts
Power Output	45	60	75		approx.watts

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

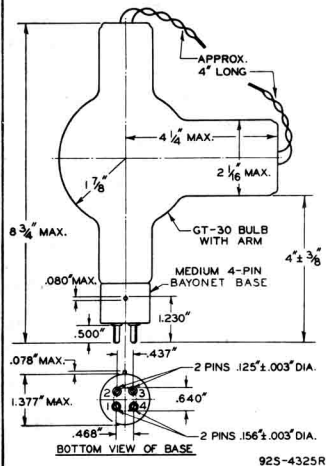
Key-down conditions per tube without modulation#

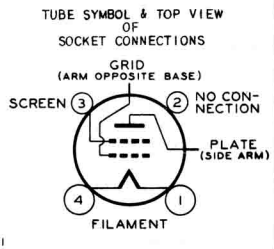
D-C Plate Voltage				3000 max.	volts
D-C Grid Voltage				-800 max.	volts
D-C Plate Current				150 max.	ma.
D-C Grid Current				40 max.	ma.
R-F Grid Current				10 max.	amp.
Plate Input				300 max.	watts
Screen Input				10 max.	watts
Plate Dissipation				100 max.	watts
Typical Operation:					
Filament Voltage	10	10	10	10	volts
D-C Plate Voltage	1500	2000	2500	3000	volts
D-C Screen Voltage	300	300	300	300	volts
D-C Grid Voltage	-150	-150	-150	-150	volts
D-C Plate Current	90	90	90	85	ma.
D-C Grid Current **	15	15	15	15	approx.ma.
Driving Power **	7	7	7	7	approx.watts
Power Output	60	100	135	165	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.

** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

For use of the 860 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

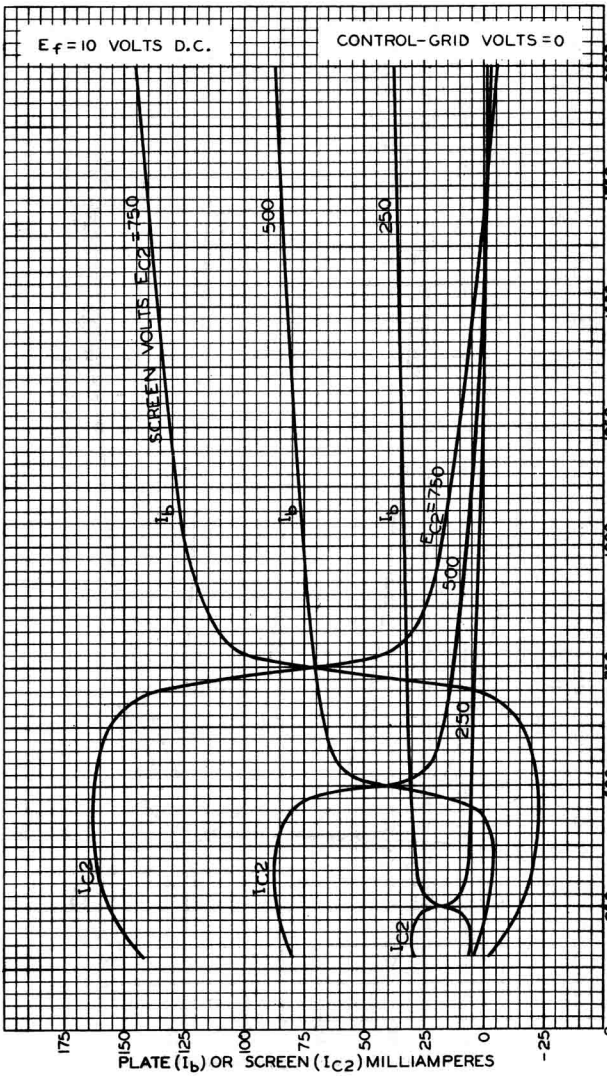




925-4325R1

860

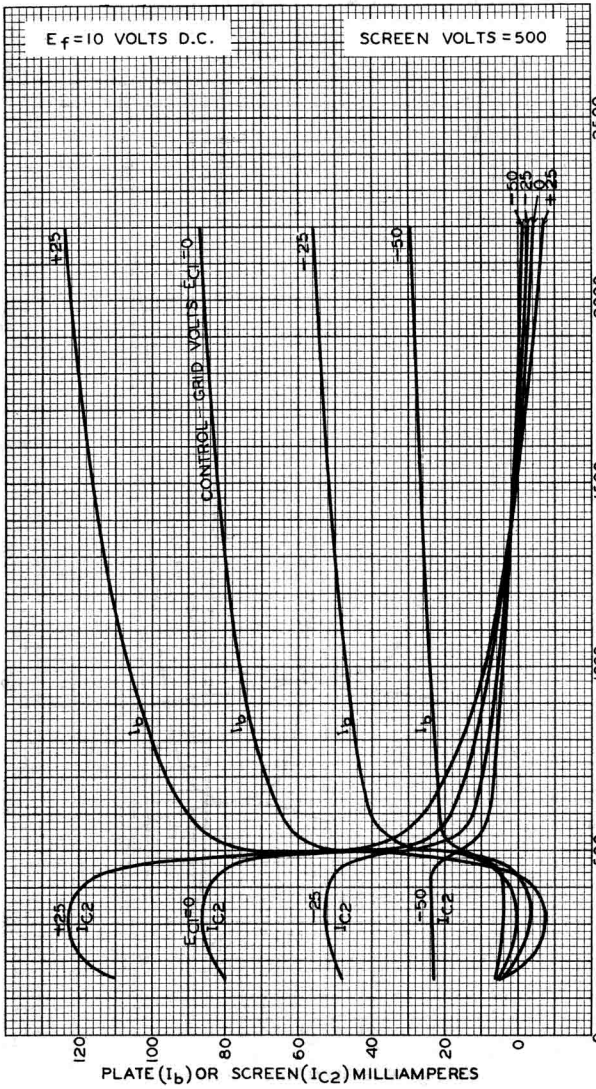
AVERAGE PLATE CHARACTERISTICS



860

860

AVERAGE PLATE CHARACTERISTICS



APR. 19, 1934

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

925-5309

861

SCREEN GRID R-F POWER AMPLIFIER

Filament	Thoriated Tungsten	
Voltage	11	a-c or d-c volts
Current	10	amp.
Amplification Factor	300 approx.	
Transconductance for plate current of 130 ma.	2100	μmhos
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	0.10*maximum	μμf
Input	14.5	μμf
Output	10.5	μμf
Overall Length		17-3/32" ± 1/8"
Maximum Radius		6-5/8"
Bulb		GT-56 with arm
Cap (opposite filament base)		No.3909
Cap (on side of bulb)		No.3910
Base		No.3503

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage			3500 max.	volts
D-C Plate Current			250 max.	ma.
R-F Grid Current			8 max.	amp.
Plate Input			600 max.	watts
Screen Input			35 max.	watts
Plate Dissipation			400 max.	watts
Typical Operation:				
Filament Voltage	11	11	11	a-c volts
D-C Plate Voltage	2500	3000	3500	volts
D-C Screen Voltage	500	500	500	volts
D-C Grid Voltage	-60	-60	-60	volts
Peak R-F Grid Voltage	250	245	215	volts
D-C Plate Current	190	175	150	ma.
D-C Grid Current**	4	4	4	approx.ma.
Driving Power ° **	20	15	15	approx.watts
Power Output	140	160	175	approx.watts

° At crest of a-f cycle with modulation factor of 1.0.

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage	3000 max.	volts
D-C Grid Voltage	-1000 max.	volts
D-C Plate Current	300 max.	ma.
D-C Grid Current	75 max.	ma.
R-F Grid Current	8 max.	amp.
Plate Input	650 max.	watts

* With external shielding.

** See next page.

(continued on next page)

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SCREEN GRID R-F POWER AMPLIFIER

(continued from preceding page)

Screen Input			30 max.	watts
Plate Dissipation			270 max.	watts
Typical Operation:				
Filament Voltage	11	11	11	a-c volts
D-C Plate Voltage	2000	2500	3000	volts
D-C Screen Voltage	425	400	375	volts
D-C Grid Voltage	-250	-225	-200	volts
Peak R-F Grid Voltage	675	625	575	volts
D-C Plate Current	250	220	200	ma.
D-C Grid Current **	65	60	55	approx.ma.
Driving Power **	45	40	35	approx.watts
Power Output	285	340	400	approx.watts

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation#

D-C Plate Voltage			3500 max.	volts
D-C Grid Voltage			-1000 max.	volts
D-C Plate Current			350 max.	ma.
D-C Grid Current			75 max.	ma.
R-F Grid Current			10 max.	amp.
Plate Input			1200 max.	watts
Screen Input			35 max.	watts
Plate Dissipation			400 max.	watts
Typical Operation:				
Filament Voltage	11	11	11	a-c volts
D-C Plate Voltage	2000	3000	3500	volts
D-C Screen Voltage	500	500	500	volts
D-C Grid Voltage	-250	-250	-250	volts
Peak R-F Grid Voltage	725	725	725	volts
D-C Plate Current	300	300	300	ma.
D-C Grid Current **	40	40	40	approx.ma.
Driving Power **	30	30	30	approx.watts
Power Output	400	600	700	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.

** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

For use of the 861 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

RCA RADIOTRON DIVISION
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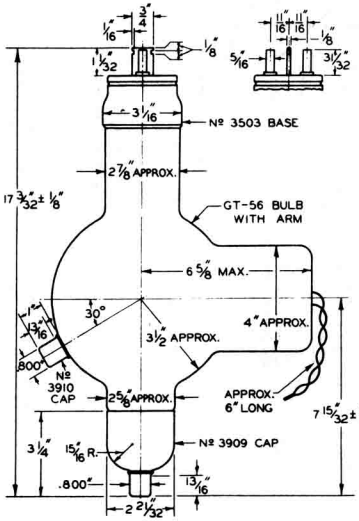
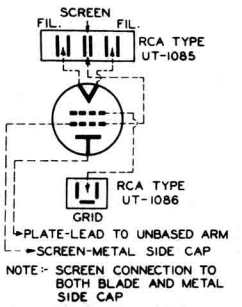
SCREEN GRID R-F POWER AMPLIFIER



92S-4324

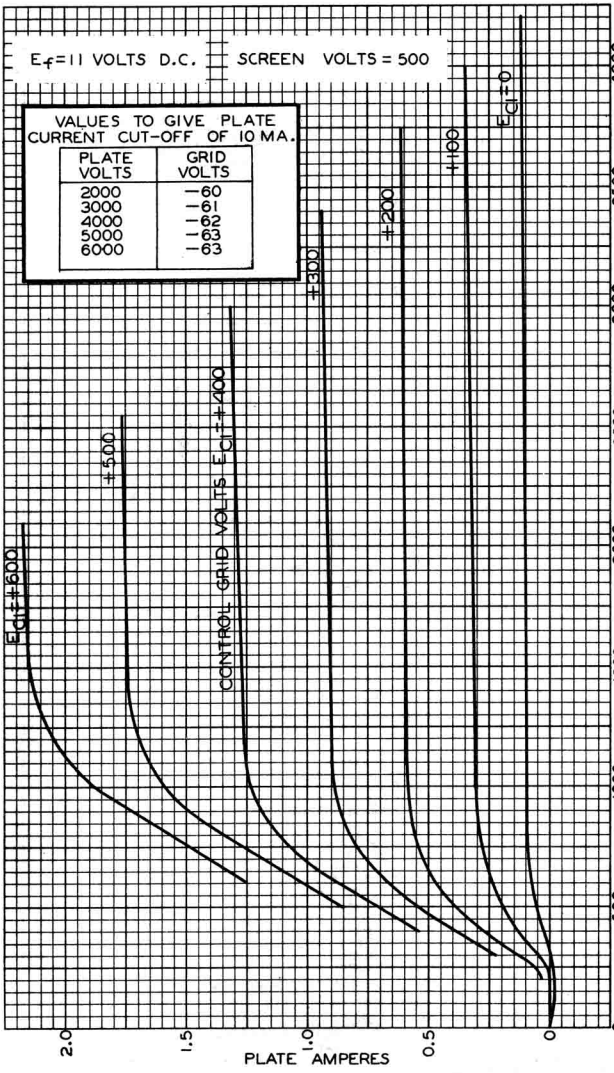
TUBE SYMBOL & CONNECTIONS TO END-MOUNTINGS



NOTE:- SCREEN CONNECTION TO BOTH BLADE AND METAL SIDE CAP

861

AVERAGE PLATE CHARACTERISTICS



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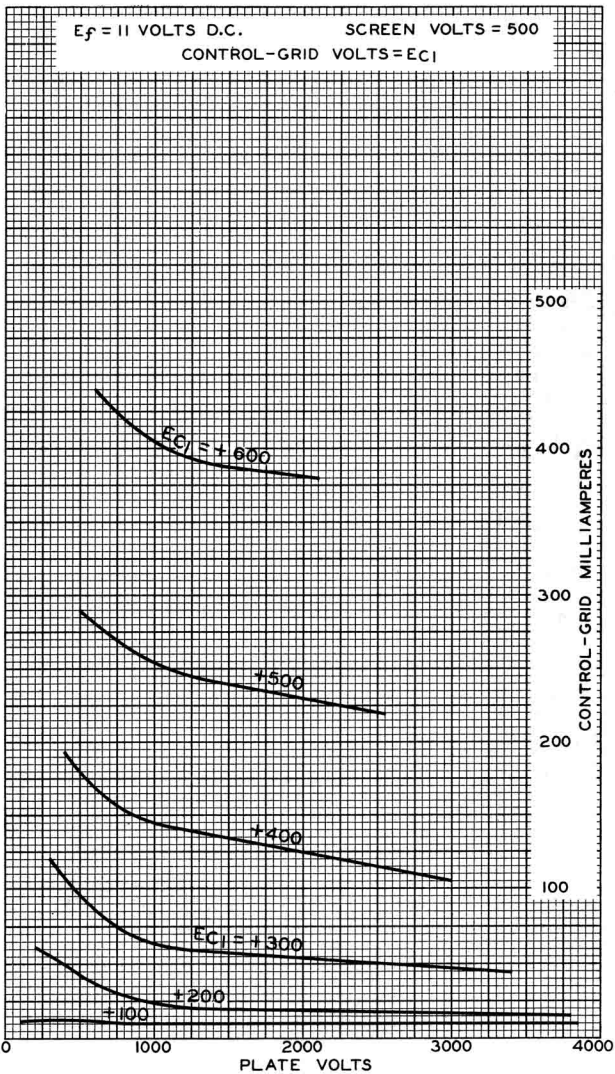
AVERAGE CHARACTERISTICS



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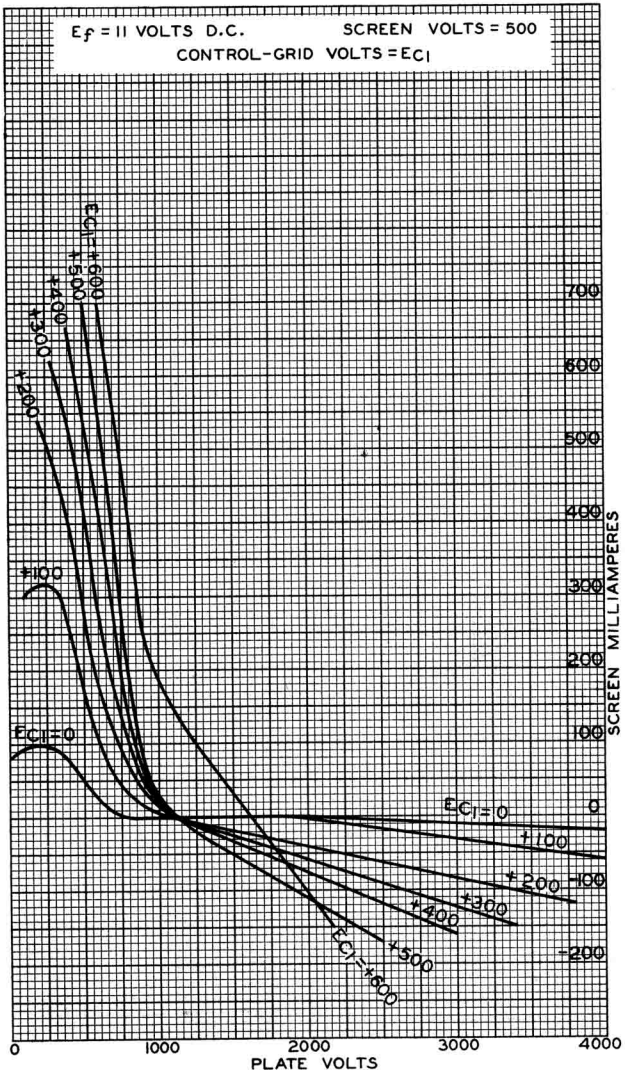
AVERAGE CHARACTERISTICS



862

OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

(WATER & FORCED-AIR COOLED)

Filament	Tungsten	
Voltage	33	d-c volts
Current	207	amp.
Amplification Factor	48	
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	75	μμf
Grid to Filament	52	μμf
Plate to Filament	2	μμf
Maximum Overall Length		60-3/8"
Maximum Radius		10"
Base (with nozzle for air-cooling of filament seal)		No.3908
Water Jacket (with nozzle for air-cooling of bulb)		UT-1289

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

This tube can often be operated at reduced filament voltage, as explained on sheet TYPES OF CATHODES in front of book.

A-F POWER AMPLIFIER & MODULATOR - Class B

D-C Plate Voltage	15000 max.	volts
Max-Signal D-C Plate Cur. *	7.5 max.	amp.
Max-Signal Plate Input *	100 max.	kw
Plate Dissipation *	50 max.	kw
Typical Operation - 2 tubes:		
Unless otherwise specified, values are for 2 tubes.		
Filament Voltage	33	d-c volts
D-C Plate Voltage	12000	volts
D-C Grid Voltage	0	approx.volts
Peak A-F Grid-to-Grid Voltage	2000	approx.volts
Zero-Signal D-C Plate Current	3	amp.
Max-Signal D-C Plate Current	13	amp.
Load Resistance (per tube)	450	ohms
Effective Load Resistance (plate to plate)	1800	ohms
Max-Signal Driving Power	450	approx.watts
Max-Signal Power Output	90	approx.kw

* Averaged over any audio-frequency cycle.

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage			20000 max.	volts
D-C Plate Current			5.0 max.	amp.
R-F Grid Current			48 max.	amp.
Plate Input			100 max.	kw
Plate Dissipation			75 max.	kw
Typical Operation:				
Filament Voltage	33	33	33	d-c volts
D-C Plate Voltage	12000	15000	18000	volts
D-C Grid Voltage	-100	-150	-200	approx.volts
Peak R-F Grid Voltage °	1000	1250	1500	approx.volts

° At crest of a-f cycle with modulation factor of 1.0.

(continued on next page)

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OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

(continued from preceding page)

D-C Plate Current	2.8	3.5	4.2	amp.
Driving Power°**	0.5	0.75	1.1	approx.kw
Power Output	11	17.5	25	approx.kw

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage			12000 max.	volts
D-C Grid Voltage			-3000 max.	volts
D-C Plate Current			5.0 max.	amp.
D-C Grid Current			1.25 max.	amp.
R-F Grid Current			48 max.	amp.
Plate Input			60 max.	kw
Plate Dissipation			50 max.	kw
Typical Operation:				
Filament Voltage	33	33	33	d-c volts
D-C Plate Voltage	8000	10000	12000	volts
D-C Grid Voltage	-700	-750	-800	approx.volts
Peak R-F Grid Voltage	1700	1850	2000	approx.volts
D-C Plate Current	4	4.5	5	amp.
D-C Grid Current**	1	1	1	approx.amp.
Driving Power**	1.7	1.85	2	approx.kw
Power Output	24	34	45	approx.kw

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation#

D-C Plate Voltage			20000 max.	volts
D-C Grid Voltage			-3000 max.	volts
D-C Plate Current			10 max.	amp.
D-C Grid Current			1.0 max.	amp.
R-F Grid Current			60 max.	amp.
Plate Input			200 max.	kw
Plate Dissipation			100 max.	kw
Typical Operation:				
Filament Voltage	33	33	33	d-c volts
D-C Plate Voltage	12000	15000	18000	volts
D-C Grid Voltage	-800	-900	-1000	approx.volts
Peak R-F Grid Voltage	2050	2300	2550	approx.volts
D-C Plate Current	6.25	7.5	8.33	amp.
D-C Grid Current**	0.8	0.85	0.9	approx.amp.
Driving Power**	1.6	2	2.4	approx.kw
Power Output	50	75	100	approx.kw

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

* Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

° At crest of a-f cycle with modulation factor of 1.0.

For use of the 862 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

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OSCILLATOR, R-F POWER AMPLIFIER CLASS B MODULATOR

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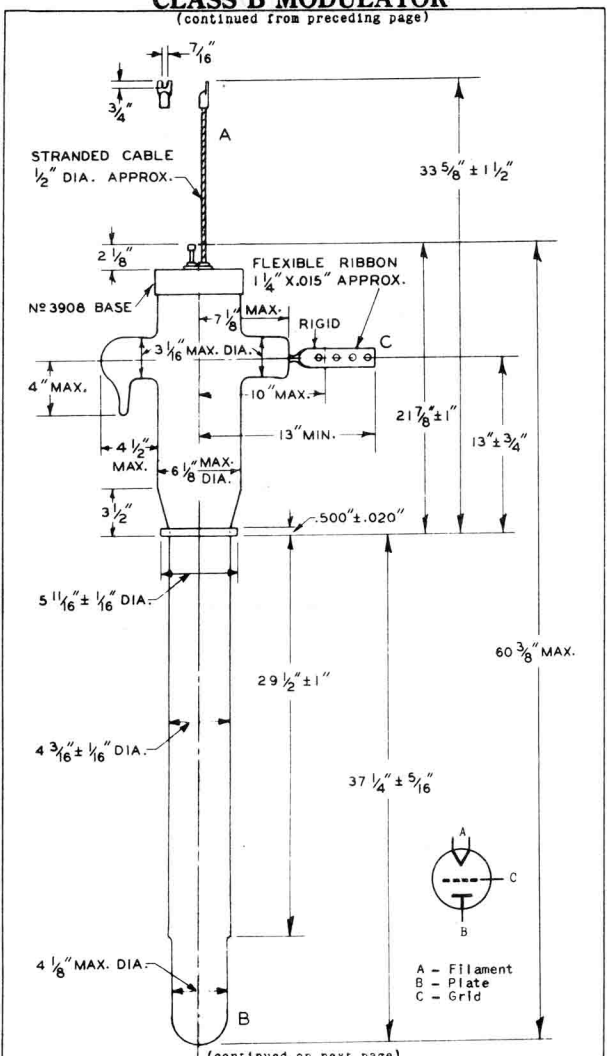

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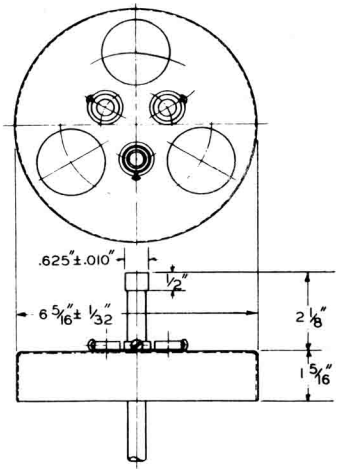
862

OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

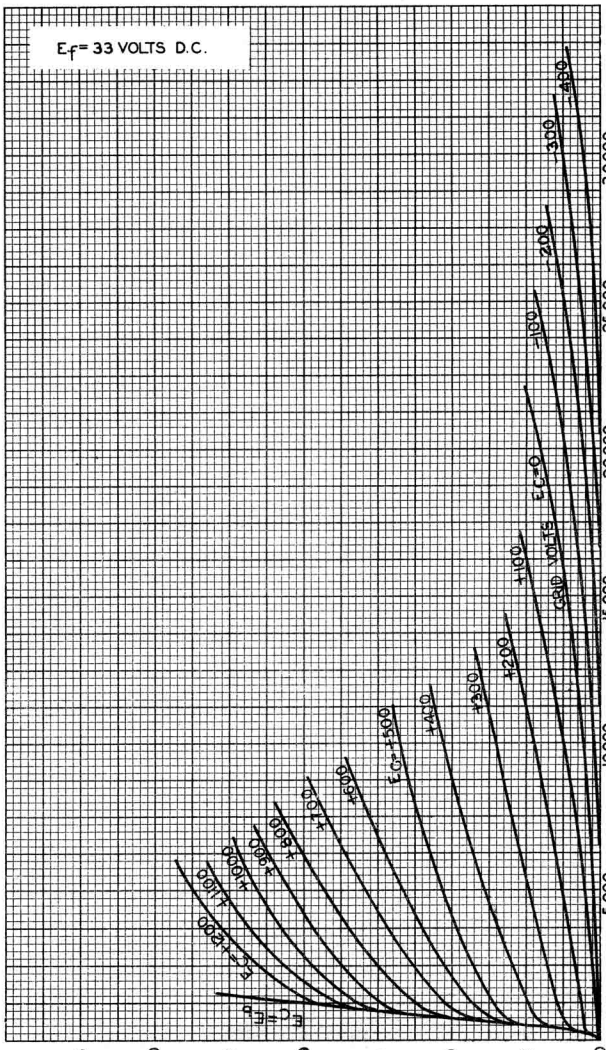
(continued from preceding page)

Nº 3908 BASE OUTLINE



862

AVERAGE PLATE CHARACTERISTICS



APRIL 26, 1933

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

925-5506

RCA

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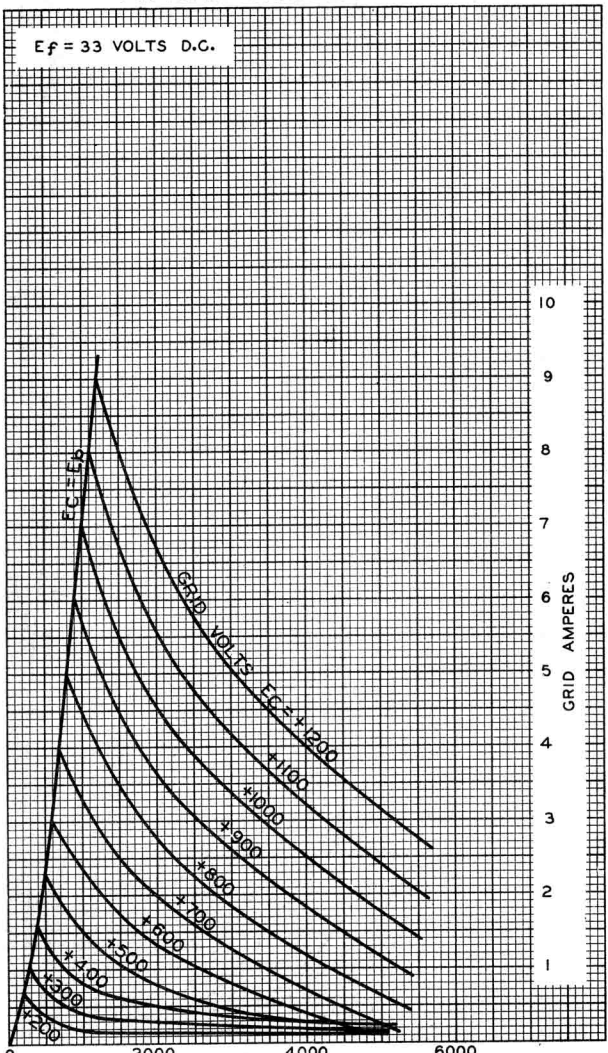
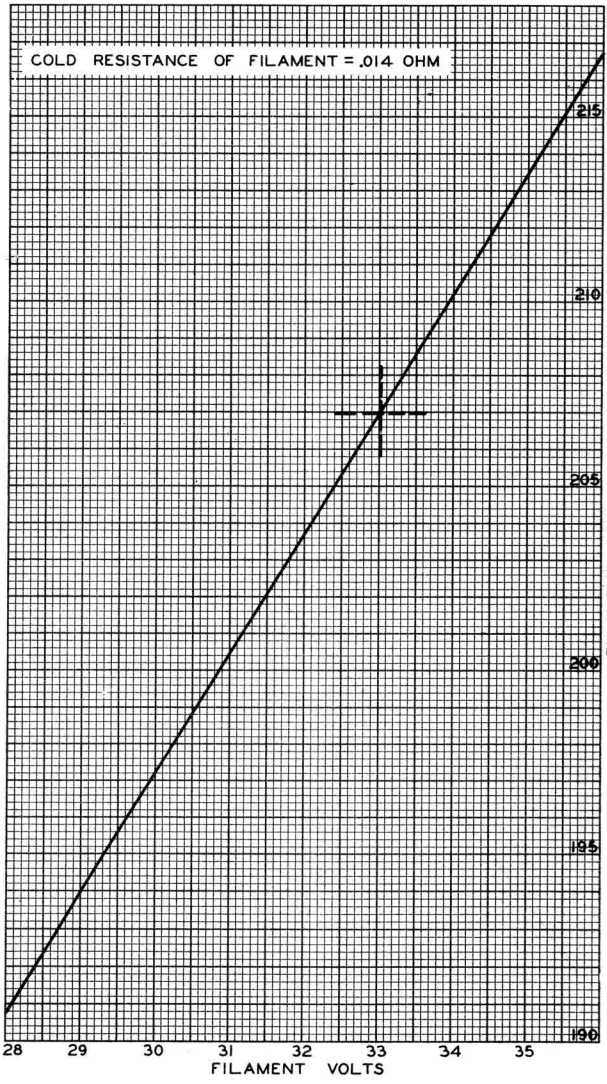
TYPICAL CHARACTERISTICS



862

AVERAGE FILAMENT CHARACTERISTIC



JUNE 19, 1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4461

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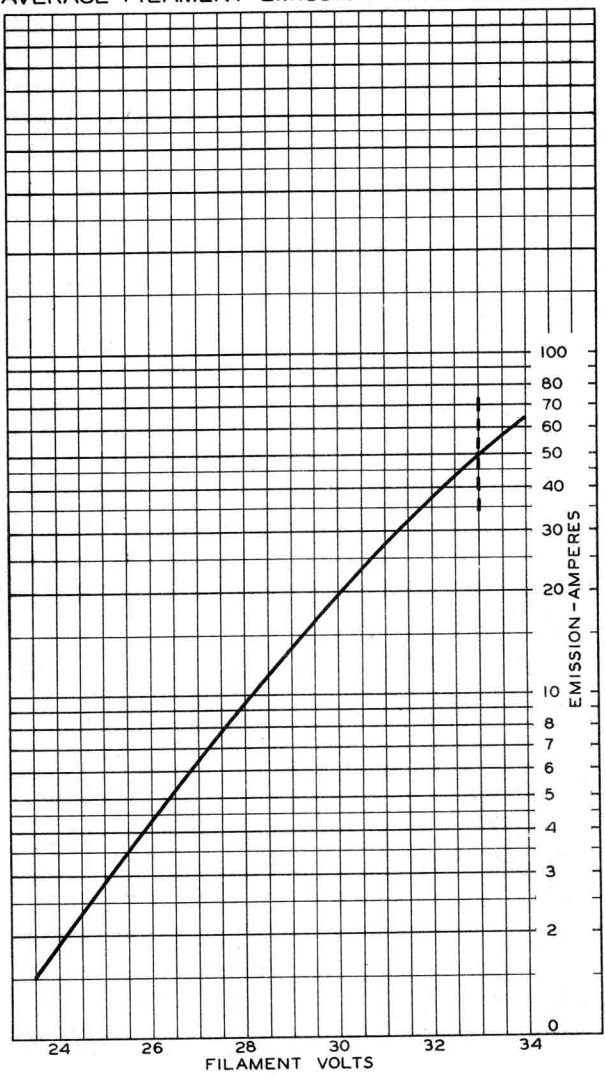
AVERAGE FILAMENT-EMISSION CHARACTERISTIC



MAY 27,1929

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4500

863

OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

(WATER COOLED)

Filament	Tungsten	
Voltage	22	a-c or d-c volts
Current	52	amp.
Amplification Factor	50	
Direct Interelectrode Capacitances (approx.):		
Grid to Plate	27	μμf
Grid to Filament	18	μμf
Plate to Filament	2	μμf
Maximum Overall Length		20-1/4"
Maximum Radius		6-1/2"
Base		No.3906
Water Jacket		UT-1285-A

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

This tube can often be operated with reduced filament voltage as explained on sheet TYPES OF CATHODES in front of book.

A-F POWER AMPLIFIER & MODULATOR - Class B

D-C Plate Voltage			15000 max.	volts
Max-Signal D-C Plate Current*			2.0 max.	amp.
Max-Signal Plate Input*			20 max.	kw
Plate Dissipation*			7.5 max.	kw
Typical Operation - 2 tubes:				
Unless otherwise specified, values are for 2 tubes.				
Filament Voltage	22	22	22	d-c volts
D-C Plate Voltage	6000	10000	12500	volts
D-C Grid Voltage	0	-110	-190	volts
Peak A-F Grid-to-Grid Volt.	1200	1620	1530	volts
Zero-Signal D-C Plate Cur.	0.5	0.5	0.4	amp.
Max-Signal D-C Plate Cur.	2.5	3.2	2.8	amp.
Load Resistance (per tube)	1050	1600	2500	ohms
Effective Load Resistance (plate to plate)	4200	6400	10000	ohms
Max-Sig. Driving Power	415	525	420	approx. watts
Max-Sig. Power Output	8	20	22	approx. kw

* Averaged over any audio-frequency cycle.

R-F POWER AMPLIFIER - Class B Telephony

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

D-C Plate Voltage			15000 max.	volts
D-C Plate Current			1.0 max.	amp.
R-F Grid Current			24 max.	amp.
Plate Input			15 max.	kw
Plate Dissipation			10 max.	kw
Typical Operation:				
Filament Voltage	22	22	22	d-c volts
D-C Plate Voltage	6000	10000	14000	volts
D-C Grid Voltage	0	-125	-210	volts
Peak R-F Grid Voltage	300	470	510	volts

(continued on next page)

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OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

(continued from preceding page)

D-C Plate Current	0.67	0.93	0.95	amp.
Driving Power ° **	65	50	30	approx. watts
Power Output	1	2.5	4	approx. kw

° At crest of a-f cycle with modulation factor of 1.0.

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage			10000 max.	volts
D-C Grid Voltage			-3000 max.	volts
D-C Plate Current			1.0 max.	amp.
D-C Grid Current			0.25 max.	amp.
R-F Grid Current			24 max.	amp.
Plate Input			10 max.	kw
Plate Dissipation			6.6 max.	kw
Typical Operation:				
Filament Voltage	22	22	22 a-c	volts
D-C Plate Voltage	6000	8000	10000	volts
D-C Grid Voltage	-1000	-1300	-1600	volts
Peak R-F Grid Voltage	1675	2000	2400	volts
D-C Plate Current	0.77	0.75	0.72	amp.
D-C Grid Current **	0.185	0.175	0.115	approx. amp.
Driving Power **	310	350	260	approx. watts
Power Output	3.5	5	6	approx. kw

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation #

D-C Plate Voltage			15000 max.	volts
D-C Grid Voltage			-3000 max.	volts
D-C Plate Current			2.0 max.	amp.
D-C Grid Current			0.25 max.	amp.
R-F Grid Current			30 max.	amp.
Plate Input			30 max.	kw
Plate Dissipation			10 max.	kw
Typical Operation:				
Filament Voltage	22	22	22 a-c	volts
D-C Plate Voltage	8000	10000	12000	volts
D-C Grid Voltage	-1000	-1300	-1600	volts
Peak R-F Grid Voltage	1800	2300	2800	volts
D-C Plate Current	1.1	1.4	1.64	amp.
D-C Grid Current **	0.18	0.18	0.18	approx. amp.
Driving Power **	320	400	500	approx. watts
Power Output	6.5	10	14	approx. kw

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

** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

For use of the 863 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

OUTLINE DIMENSIONS, TUBE SYMBOL, TERMINAL CONNECTIONS, and **FILAMENT CHARACTERISTICS** for the 863 are the same as for the 207.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

RCA

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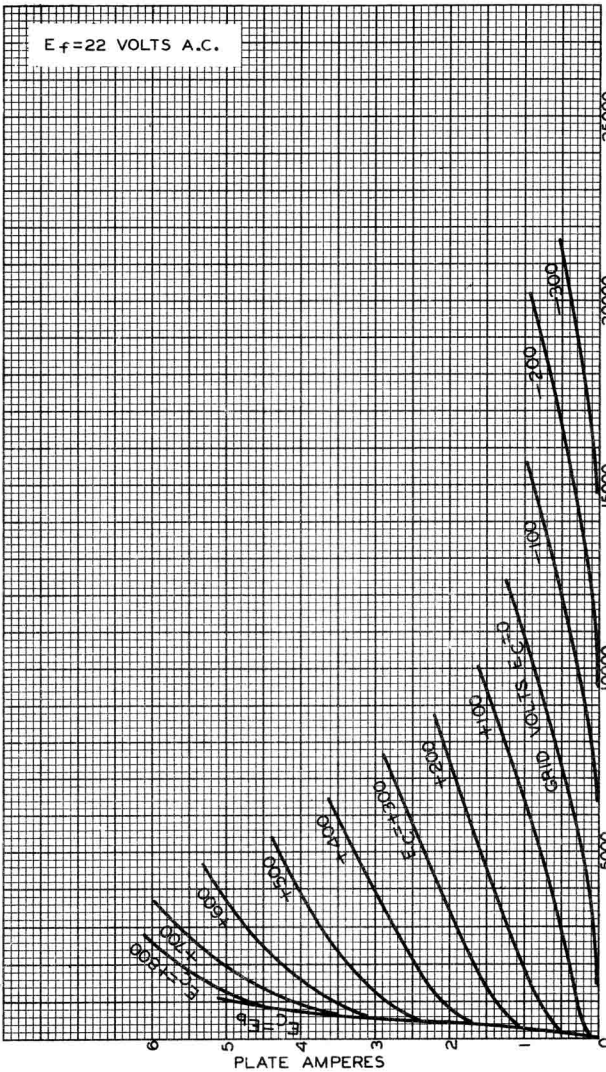
AVERAGE PLATE CHARACTERISTICS



RCA

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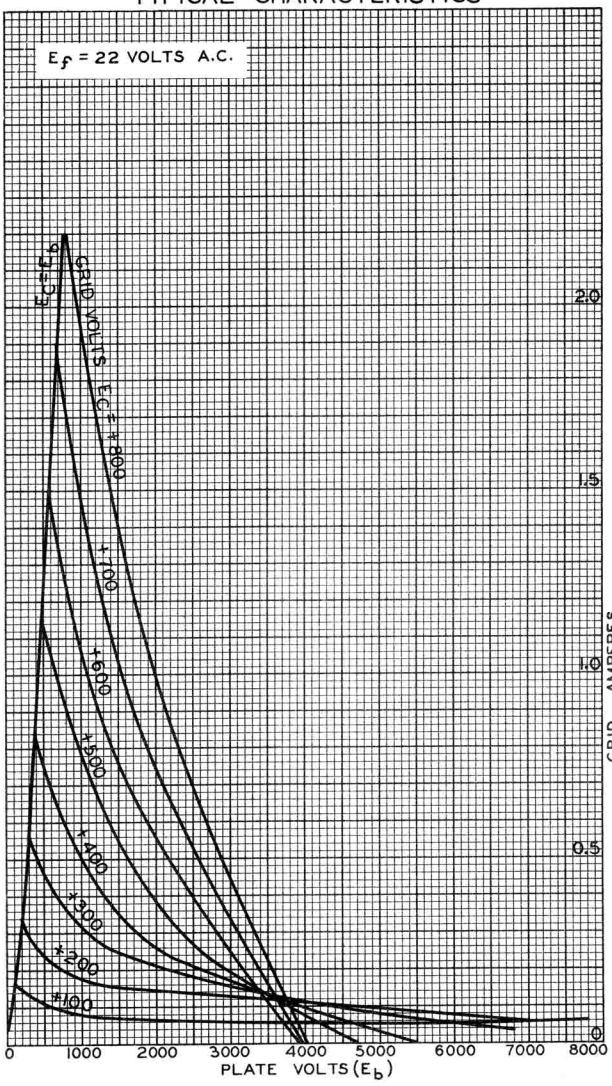
TYPICAL CHARACTERISTICS



864

AMPLIFIER

LOW MICROPHONIC DESIGN

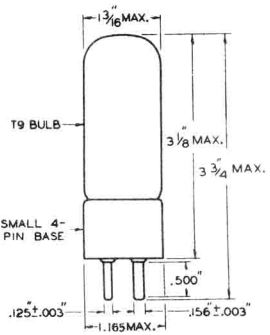
Filament	Coated	
Voltage	1.1	d-c volts
Current	0.25	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	5.3	μμf
Grid to Filament	3.3	μμf
Plate to Filament	2.1	μμf
Maximum Overall Length		3-3/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Small 4-Pin

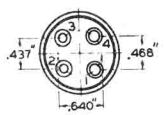
AMPLIFIER - Class A

Operating Conditions and Characteristics:

Filament Voltage	1.1	1.1	d-c volts
Plate Voltage	90	135 max.	volts
Grid Voltage	-4.5	-9	volts
Amplification Factor	8.2	8.2	
Plate Resistance	13500	12700	ohms
Mutual Conductance	610	645	μmhos
Plate Current	2.9	3.5	ma.

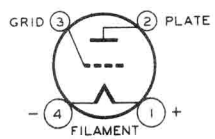
If a grid-coupling resistor is used, its maximum value should not exceed 2.0 megohms.





BOTTOM VIEW OF BASE

TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS



92C-451R3

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

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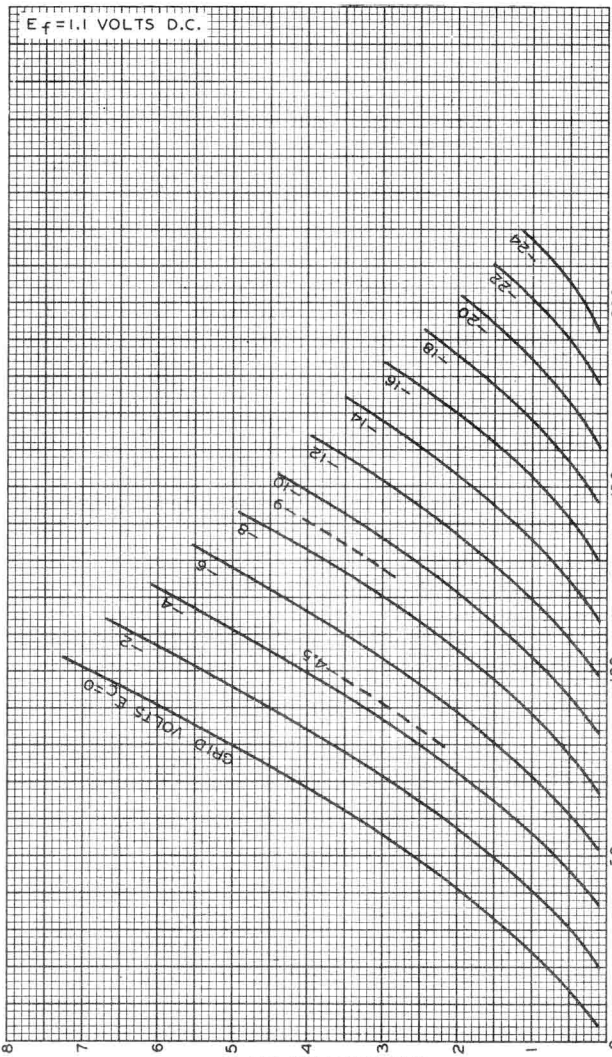
AVERAGE PLATE CHARACTERISTICS



865

SCREEN GRID R-F POWER AMPLIFIER

Filament	Thoriated Tungsten	
Voltage	7.5	a-c or d-c volts
Current	2.0	amp.
Amplification Factor	150 approx.	
Mutual Conductance for plate current of 18 ma.	750	μmhos
Direct Interelectrode Capacitances:		
Grid to Plate	0.10*maximum	μμf
Input	8.5	μμf
Output	8.0	μμf
Maximum Overall Length		5-3/4"
Maximum Diameter		2-1/16"
Bulb		ST-16
Cap		Small Metal
Base		Medium 4-Pin Bayonet

MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

R-F POWER AMPLIFIER - Class B (Telephony)

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

D-C Plate Voltage		750 max.	volts
D-C Screen Voltage		175 max.	volts
D-C Plate Current		30 max.	ma.
R-F Grid Current		4 max.	amp.
Plate Input		22.5 max.	watts
Screen Input		3 max.	watts
Plate Dissipation		15 max.	watts
Typical Operation:			
Filament Voltage	7.5	7.5	a-c volts
D-C Plate Voltage	500	750	volts
D-C Screen Voltage	125	125	volts
D-C Grid Voltage	-30	-30	volts
D-C Plate Current	30	22	ma.
D-C Grid Current	5	3	approx.ma.
Driving Power ° **	2	1.5	approx.watts
Power Output	3	4.5	approx.watts

° At crest of a-f cycle with modulation factor of 1.0.

PLATE-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage	500 max.	volts
D-C Screen Voltage	175 max.	volts
D-C Grid Voltage	-200 max.	volts
D-C Plate Current	60 max.	ma.
D-C Grid Current	15 max.	ma.
R-F Grid Current	4 max.	amp.

* With external shielding.

** See next page.

(continued on next page)

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SCREEN GRID R-F POWER AMPLIFIER

(continued from preceding page)

Plate Input			30 max.	watts
Screen Input			2 max.	watts
Plate Dissipation			10 max.	watts
Typical Operation:				
Filament Voltage	7.5	7.5	a-c	volts
D-C Plate Voltage	375	500		volts
D-C Screen Voltage	125	125		volts
D-C Grid Voltage	-120	-120		volts
D-C Plate Current	50	40		ma.
D-C Grid Current **	11	9	approx.	ma.
Driving Power **	3	2.5	approx.	watts
Power Output	8.5	10	approx.	watts

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without modulation #

D-C Plate Voltage				750 max.		volts
D-C Screen Voltage				175 max.		volts
D-C Grid Voltage				-200 max.		volts
D-C Plate Current				60 max.		ma.
D-C Grid Current				15 max.		ma.
R-F Grid Current				5 max.		amp.
Plate Input				45 max.		watts
Screen Input				3 max.		watts
Plate Dissipation				15 max.		watts
Typical Operation:						
Filament Voltage	7.5	7.5	7.5	7.5	a-c	volts
D-C Plate Voltage	375	500	625	750		volts
D-C Screen Voltage	125	125	125	125		volts
D-C Grid Voltage	-80	-80	-80	-80		volts
D-C Plate Current	55	50	45	40		ma.
D-C Grid Current **	11	9	6	5.5	approx.	ma.
Driving Power **	2.5	2.0	1.2	1.0	approx.	watts
Power Output	8.5	10	14	16	approx.	watts

** Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.

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

For use of the 865 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs. FREQUENCY.

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

865

AVERAGE PLATE CHARACTERISTICS

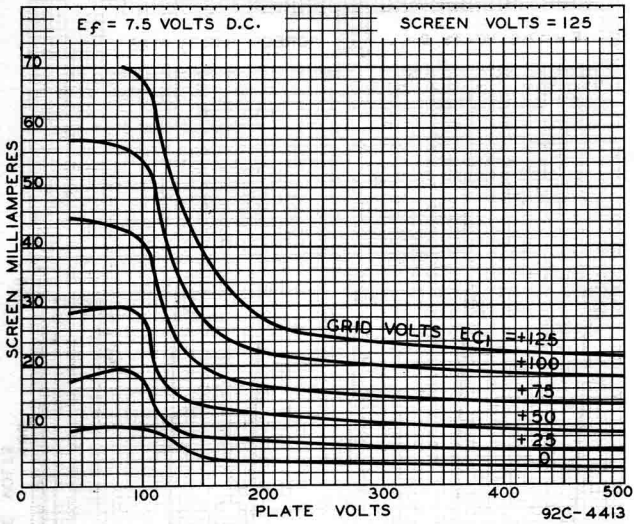
MAY 10,1935

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

92C-4412

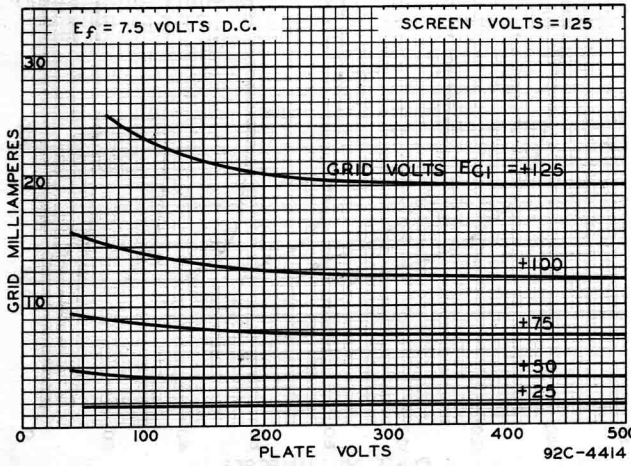
865

AVERAGE CHARACTERISTICS



92C-4413

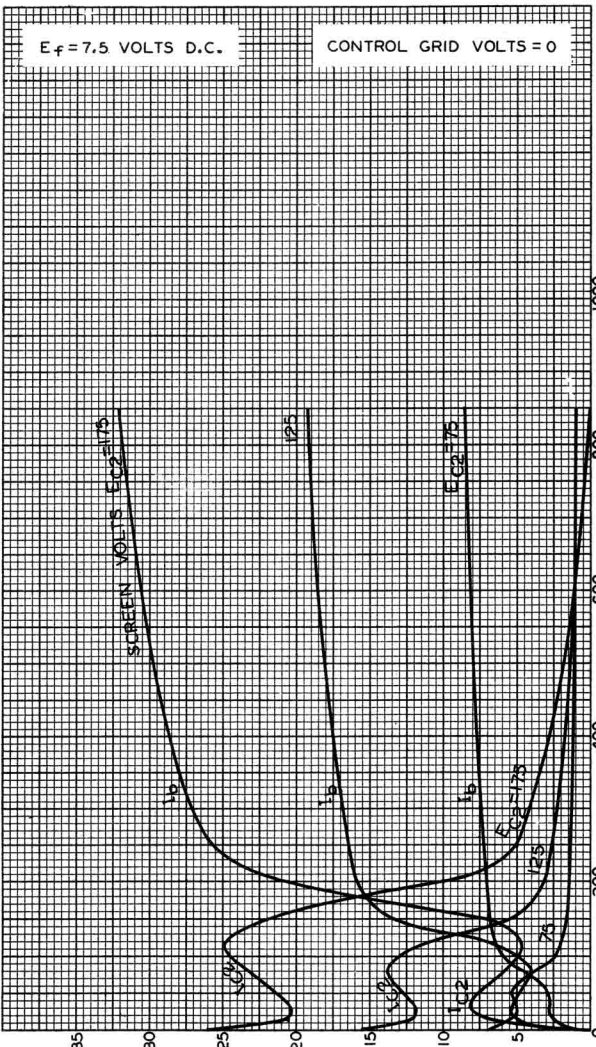
AVERAGE CHARACTERISTICS



92C-4414

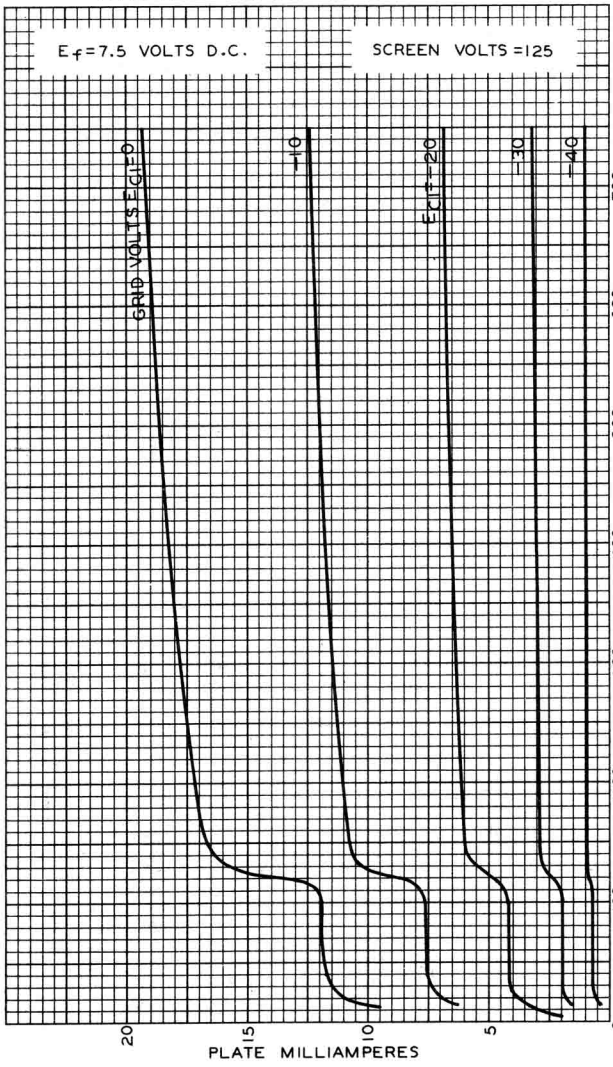
865

AVERAGE PLATE CHARACTERISTICS



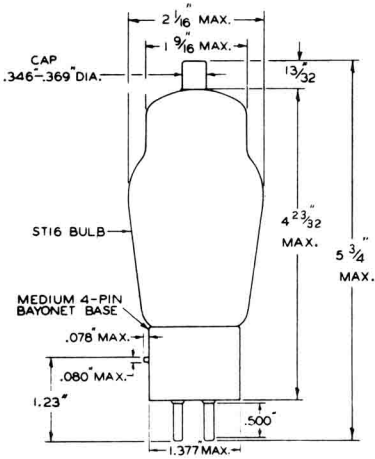
865

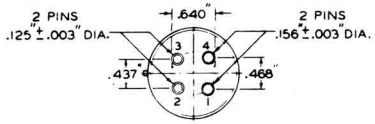
AVERAGE PLATE CHARACTERISTICS



865

SCREEN GRID R-F POWER AMPLIFIER

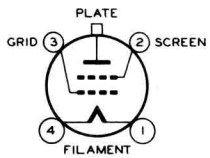




BOTTOM VIEW OF BASE

92S-4272R3

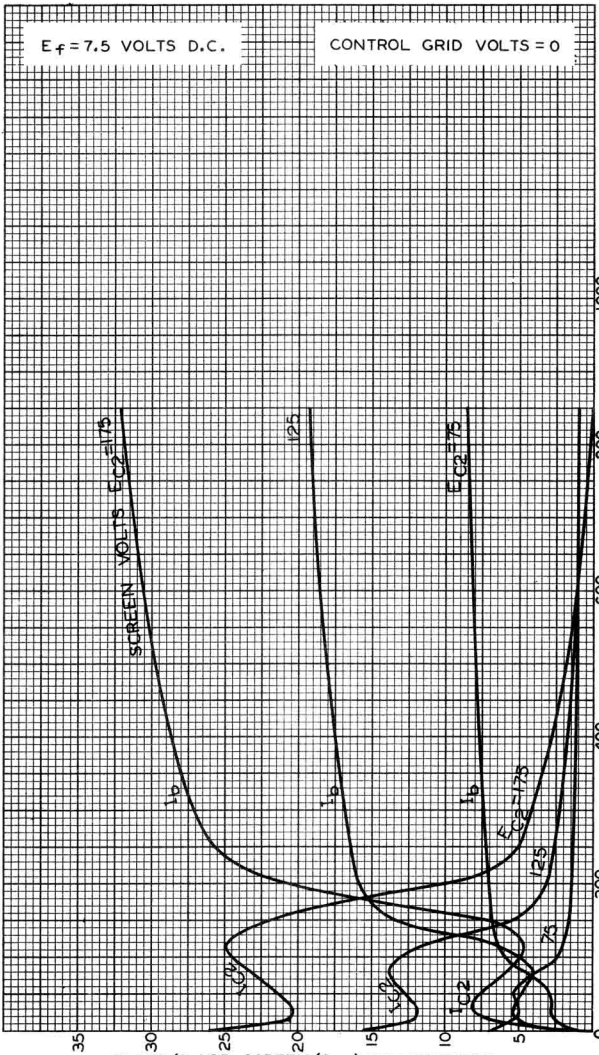
TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS



865

865

AVERAGE PLATE CHARACTERISTICS



RCA

865/565

SCREEN GRID R-F POWER AMPLIFIER

Filament	Thoriated Tungsten		
Voltage	7.5	a-c or d-c	volts
Current	2.0		amp.
Amplification Factor	150 approx.		
Mutual Conductance for plate current of 18 ma.	750 μmhos		
Direct Interelectrode Capacitances:			
Grid to Plate	0.10 maximum	μμf	
Input	8.5	μμf	
Output	8.5	μμf	
Maximum Overall Length			6-1/4"
Maximum Diameter			2-3/16"
Bulb			S-17
Cap			Small Metal
Base			Medium 4-Pin Bayonet

R-F POWER AMPLIFIER - Class B (Telephony)

(Carrier Conditions; for use with a Modulation Factor up to 1.0)

D-C Plate Voltage		750 max.	volts
D-C Plate Current		30 max.	ma.
Plate Dissipation		15 max.	watts
Screen Dissipation		3 max.	watts
R-F Grid Current		4 max.	amp.
Typical Operation:			
Filament Voltage	7.5	7.5	a-c volts
D-C Plate Voltage	500	750	volts
Screen Voltage	125	125	approx. volts
Grid Voltage	-30	-30	approx. volts
D-C Plate Current	30	22	ma.
Peak Power Output	12	18	approx. watts
Carrier Power Output	3	4.5	approx. watts

PLATE-MODULATED R-F POWER AMPLIFIER - Class C (Telephony)

(Carrier Conditions; for use with a Modulation Factor up to 1.0)

D-C Plate Voltage		500 max.	volts
D-C Plate Current		60 max.	ma.
Plate Dissipation		10 max.	watts
Screen Dissipation		2 max.	watts
R-F Grid Current		4 max.	amp.
D-C Grid Current		15 max.	ma.
Typical Operation:			
Filament Voltage	7.5	7.5	a-c volts
D-C Plate Voltage	375	500	volts
Screen Voltage	125	125	approx. volts
Grid Voltage	-120	-120	approx. volts
D-C Plate Current	50	40	ma.
D-C Grid Current*	11	9	ma.
Driving Power*	3	2.5	watts
Power Output	8.5	10	approx. watts

* See next page.

(continued on next page)

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865/565

SCREEN GRID R-F POWER AMPLIFIER

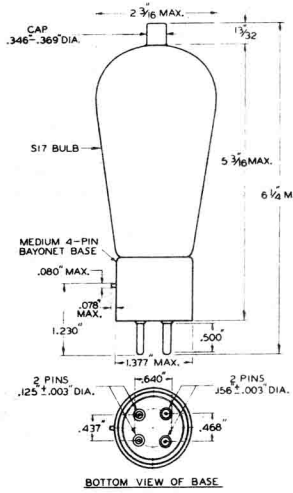
(continued from preceding page)

R-F POWER AMPLIFIER & OSCILLATOR - Class C (Telegraphy)

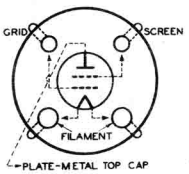
(Key-down Conditions)

D-C Plate Voltage				750 max.	volts
D-C Plate Current				60 max.	ma.
Plate Dissipation				15 max.	watts
Screen Dissipation				3 max.	watts
R-F Grid Current				5 max.	amp.
D-C Grid Current				15 max.	ma.
Typical Operation:					
Filament Voltage	7.5	7.5	7.5	7.5	a-c volts
D-C Plate Voltage	375	500	625	750	volts
Screen Voltage	125	125	125	125	approx. volts
Grid Voltage	-80	-80	-80	-80	approx. volts
D-C Plate Current	55	50	45	40	ma.
D-C Grid Current*	11	9	6	5.5	ma.
Driving Power*	2.5	2.0	1.2	1.0	watts
Power Output	8.5	10	14	16	approx. watts

* Subject to wide variations depending on the impedance of the load circuit. High impedance load circuits require more grid current and driving power to obtain the desired output. Low impedance circuits need less grid current and driving power, but plate circuit efficiency is sacrificed. The driving stage should have a tank circuit of good regulation and should be capable of delivering considerably more than the required driving power.



TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS



866

HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament*	Coated	
Voltage	2.5	a-c volts
Current	5.0	amp.
Maximum Overall Length		6-5/8"
Maximum Diameter		2-7/16"
Bulb		S-19
Cap		Medium Metal
Base		Medium 4-Pin Bayonet

MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temp. Range*	*Column I*	*Column II*	
Up to 150~	10° - 60°C	200 max.	7500 max.	volts
Peak Plate Current		2.0 max.	1.0 max.	amp.
Average Plate Current		0.50 max.	0.25 max.	amp.
Tube Voltage Drop		15	15	approx.volts

* The filament of the 866 should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately 30 seconds.

For *shielding and r-f filter circuits*, refer to Type 871.

NOTES ON COLUMN II

The table on the next page gives empirical values of choke inductance (L) and condenser capacity (C) for choke-input-to-filter circuits which will keep the peak plate current below the recommended maximum, provided the average d-c load current does not exceed the maximum load-current values shown. Values of (L) and (C) are based on a 60-cycle a-c voltage supply.

The capacitance (C) is small enough to prevent excessive surges when power is first applied to the circuit, and yet large enough to give adequate filtering. If the inductance (L) is increased, it is permissible to increase the capacitance in the same proportion. In a two-section filter with two inductances of unequal value, the larger inductance should be placed next to the rectifier tubes. With such an arrangement, the maximum value of each capacitance should be determined on the basis of the value of the inductance preceding it.

The circuits of FIGS. 1, 2, and 3 will give a ripple voltage of less than 5% when used with a two-section filter having the minimum of inductance and the corresponding maximum of capacitance. The circuits of FIGS. 4 and 5 will give a ripple voltage of less than 1%. For any of these circuits, better filtering may be obtained with the inductances larger than the minimum given in the table. For these larger inductances, the corresponding capacitances may be increased by the same percentage as the inductances to give still better results.

(continued on next page)

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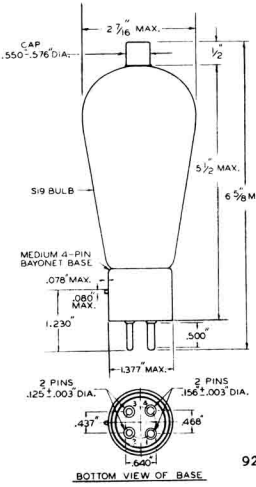
HALF-WAVE MERCURY-VAPOR RECTIFIER

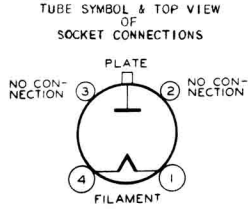
(continued from preceding page)

For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	A-C INPUT VOLTS (RMS)	MAX. D-C OUTPUT VOLTS TO FILTER	CHOKE INPUT ONE-SECTION FILTER MIN. CHOKE (L) henrys	CHOKE INPUT ONE-SECTION FILTER MAX. CONDENSER (C) µf	MAX. D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	2650 per tube 2000 " " 1500 " " 1000 " "	2385 1800 1350 900	6.0 4.9 3.3 2.1	1.6 1.8 2.8 4.2	0.5 0.5 0.5 0.5
SINGLE-PHASE FULL-WAVE (4 tubes) FIG. 2	5300 total 4500 " 4000 " 3000 "	4770 4050 3600 2700	12.0 10.0 8.4 6.8	0.8 1.0 1.2 1.5	0.5 0.5 0.5 0.5
THREE-PHASE HALF-WAVE FIG. 3	3065 per leg 2500 " " 2000 " " 1500 " "	3585 2925 2340 1755	2.2 1.7 1.0 0.8	1.8 2.4 3.0 4.0	0.75 0.75 0.75 0.75
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	3065 per leg 2500 " " 2000 " " 1500 " "	3585 2925 2340 1750	1.5 1.2 1.0 0.7	0.7 0.9 1.1 1.5	1.5 1.5 1.5 1.5
THREE-PHASE FULL-WAVE FIG. 5	3065 per leg 2500 " " 2000 " " 1500 " "	7175 5850 4680 3510	1.5 1.2 1.0 0.8	0.84 0.9 1.0 1.3	0.75 0.75 0.75 0.75
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1*	2650 per tube 2000 " " 1500 " " 1000 " "	3000 2260 1700 1150	- - - -	- - - -	0.25 0.25 0.25 0.25

* With condenser input to filter.





92S-4319

866/566

HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament*	Coated	
Voltage	2.5	a-c volts
Current	5.0	amp.
Maximum Overall Length		6-5/8"
Maximum Diameter		2-7/16"
Bulb		S-19
Cap		Medium Metal
Base		Medium 4-Pin Bayonet
Peak Inverse Voltage		
Supply Freq. *Ambient Temp.*		
Up to 150 ~ 0° - 50°C		7500 max. volts
Peak Plate Current		0.6 max. amp.
Tube Voltage Drop		15 approx. volts

* The filament of the 866/566 should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately 30 seconds.

For *shielding and r-f filter circuits,* refer to Type 872-A.

The table on the next page gives empirical values of choke inductance (L) and condenser capacity (C) for choke-input-to-filter circuits which will keep the peak plate current below the recommended maximum, provided the average d-c load current does not exceed the maximum load-current values shown. Values of (L) and (C) are based on a 60-cycle a-c voltage supply.

The capacitance (C) is small enough to prevent excessive surges when power is first applied to the circuit, and yet large enough to give adequate filtering. If the inductance (L) is increased, it is permissible to increase the capacitance in the same proportion. In a two-section filter with two inductances of unequal value, the larger inductance should be placed next to the rectifier tubes. With such an arrangement, the maximum value of each capacitance should be determined on the basis of the value of the inductance preceding it.

The circuits of FIGS. 1, 2, and 3 will give a ripple voltage of less than 5% when used with a two-section filter having the minimum of inductance and the corresponding maximum of capacitance. The circuits of FIGS. 4 and 5 will give a ripple voltage of less than 1%. For any of these circuits, better filtering may be obtained with the inductances larger than the minimum given in the table. For these larger inductances, the corresponding capacitances may be increased by the same percentage as the inductances to give still better results. For example, with a 100% increase in the inductance (L) next to the rectifier tubes, the d-c load current may be increased 50%. A 200% increase permits an increase of 67% in load current.

(continued on next page)

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866/566

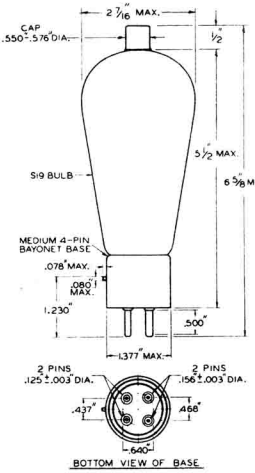
HALF-WAVE MERCURY-VAPOR RECTIFIER

For Circuits, refer to 92S-4315 (page backing Type 872)

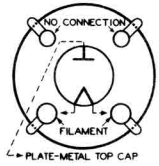
(continued from preceding page)

CIRCUIT	A-C INPUT VOLTS (RMS)	MAX. D-C OUTPUT VOLTS TO FILTER	CHOKE INPUT ONE-SECTION FILTER MIN. CHOKE (L) henrys	CHOKE INPUT ONE-SECTION FILTER MAX. CONDENSER (C) µf	MAX. D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	2650 per tube	2385	10.0	1.0	0.3
	2000 " "	1800	8.3	1.1	0.3
	1500 " "	1350	5.6	1.7	0.3
	1000 " "	900	3.7	2.6	0.3
SINGLE-PHASE FULL-WAVE (4 tubes) FIG. 2	5300 total	4770	20.0	0.5	0.3
	4500 "	4050	16.9	0.6	0.3
	4000 "	3600	15.0	0.7	0.3
	3000 "	2700	11.3	0.8	0.3
THREE-PHASE HALF-WAVE FIG. 3	3065 per leg	3585	3.7	1.1	0.3
	2500 " "	2925	3.0	1.4	0.3
	2000 " "	2340	2.4	1.8	0.3
	1500 " "	1755	1.8	2.4	0.3
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	3065 per leg	3585	1.8	0.6	1.2
	2500 " "	2925	1.5	0.7	1.2
	2000 " "	2340	1.2	0.9	1.2
	1500 " "	1755	0.9	1.2	1.2
THREE-PHASE FULL-WAVE FIG. 5	3065 per leg	7175	2.5	0.5	0.6
	2500 " "	5850	2.0	0.5	0.6
	2000 " "	4680	1.7	0.6	0.6
	1500 " "	3510	1.3	0.8	0.6
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1*	2650 per tube	3000	-	-	0.165
	2000 " "	2260	-	-	0.165
	1500 " "	1700	-	-	0.165
	1000 " "	1150	-	-	0.165

* With condenser input to filter.



TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS



866-A

HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament *	Coated	
Voltage	2.5	a-c volts
Current	5.0	amp.
Maximum Overall Length		6-5/8"
Maximum Diameter		2-7/16"
Bulb		S-19
Cap		Medium Metal
Base		Medium 4-Pin Bayonet

MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temp. Range*	*Column I*	*Column II*	
Up to 1000 ~	25° - 70°C	200 max.	5000 max.	volts
Up to 150 ~	25° - 60°C	-	10000 max.	volts
Peak Plate Current		2.0 max.	1.0 max.	amp.
Average Plate Current		0.50 max.	0.25 max.	amp.
Tube Voltage Drop		10	10 approx.	volts

* The filament of the 866-A is partially shielded from the plate to permit operation from a power supply having a frequency up to 1000 cycles per second. The filament should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately 30 seconds.

For *shielding and r-f filter circuits*, refer to Type 871.

NOTES ON COLUMN II

The table on the next page gives empirical values of choke inductance (L) and condenser capacity (C) for choke-input-to-filter circuits which will keep the peak plate current below the recommended maximum, provided the average d-c load current does not exceed the maximum load-current values shown. Values of (L) and (C) are based on a 60-cycle a-c voltage supply.

The capacitance (C) is small enough to prevent excessive surges when power is first applied to the circuit, and yet large enough to give adequate filtering. If the inductance (L) is increased, it is permissible to increase the capacitance in the same proportion. In a two-section filter with two inductances of unequal value, the larger inductance should be placed next to the rectifier tubes. With such an arrangement, the maximum value of each capacitance should be determined on the basis of the value of the inductance preceding it.

The circuits of FIGS. 1, 2, and 3 will give a ripple voltage of less than 5% when used with a two-section filter having the minimum of inductance and the corresponding maximum of capacitance. The circuits of FIGS. 4 and 5 will give a ripple voltage of less than 1%. For any of these circuits, better filtering may be obtained with the inductances larger than the minimum given in the table. For these larger inductances, the corresponding capacitances may be increased by the same percentage as the inductances to give still better results.

(continued on next page)

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

866-A

866-A

HALF-WAVE MERCURY-VAPOR RECTIFIER

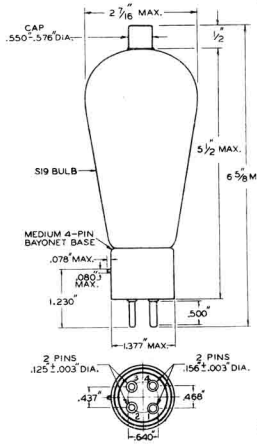
For Circuits, refer to 92S-4315 (page backing Type 872)

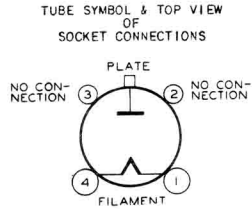
(continued from preceding page)

CIRCUIT	A-C INPUT VOLTS** (RMS)	MAX. D-C OUTPUT VOLTS TO FILTER	CHOKE INPUT ONE-SECTION FILTER MIN. CHOKE (L) henrys	CHOKE INPUT ONE-SECTION FILTER MAX. CONDENSER (C) µf	MAX. D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1	3535 per tube	3180	8.0	1.25	0.5
	3000 " "	2700	6.8	1.5	0.5
	2000 " "	1800	4.5	2.1	0.5
	1500 " "	1350	3.4	2.8	0.5
SINGLE-PHASE FULL-WAVE (4 tubes) FIG.2	7070 total	6360	16.0	0.6	0.5
	6000 "	5400	13.5	0.7	0.5
	5000 "	4500	11.0	0.9	0.5
	4000 "	3600	8.9	1.1	0.5
THREE-PHASE HALF-WAVE FIG.3	4080 per leg	4780	3.2	1.4	0.75
	3000 " "	3510	2.2	2.0	0.75
	2000 " "	2340	1.4	3.0	0.75
	1500 " "	1750	1.1	4.0	0.75
THREE-PHASE DOUBLE-Y PARALLEL FIG.4	4080 per leg	4780	2.0	0.5	1.5
	3000 " "	3510	1.5	0.7	1.5
	2000 " "	2340	1.0	1.1	1.5
	1500 " "	1750	0.7	1.5	1.5
THREE-PHASE FULL-WAVE FIG.5	4080 per leg	9570	1.8	0.5	0.75
	3000 " "	7020	1.4	0.7	0.75
	2000 " "	4680	0.9	1.2	0.75
	1500 " "	3510	0.7	1.5	0.75
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1*	3535 per tube	3950	-	-	0.25
	3000 " "	3390	-	-	0.25
	2000 " "	2260	-	-	0.25
	1500 " "	1700	-	-	0.25

* With condenser input to filter.

** For use under the conditions of the 10000-volt peak inverse rating. If the 866-A is to be used under frequency and/or temperature conditions such that the peak inverse voltage is limited to 5000 volts, the a-c input voltage and d-c output voltage values in the table should be multiplied by a factor of 0.5 to give new values for the 5000-volt conditions.





92S-4319 R1

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

869-A

HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament*	Coated	
Voltage	5	a-c volts
Current	18	amp.
Overall Length		14-1/4"±1/8"
Maximum Diameter		5-1/16"
Bulb		GT-40
Cap		No. 3905
Base#		No. 3502

MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temp. Range*		
Up to 150~	25° - 60°C	20000 max.	volts
Peak Plate Current		10 max.	amp.
Average Plate Current	Averaged over period of 30 sec.	2.5 max.	amp.
Tube Voltage Drop		10 approx.	volts

* The filament of the 869-A should be allowed to come up to operating temperature before plate voltage is applied. For average conditions the delay is approximately 60 seconds.

\# Base shell is not connected to either filament lead within base.

For *shielding and r-f filter circuits*, refer to Type 871.

The table below classifies suitable rectifier circuits for the 869-A and shows their safe maximum input and maximum output operating conditions. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit.

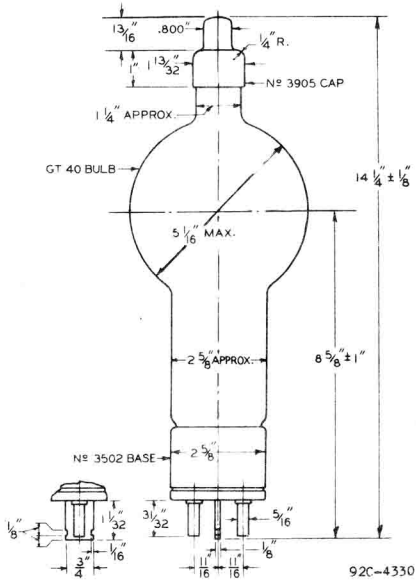
For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	7000 per tube	6300	5.0
SINGLE-PHASE FULL-WAVE (4 tubes) FIG. 2	14000 total	12600	5.0
THREE-PHASE HALF-WAVE FIG. 3	8250 per leg	9600	7.5
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	8250 per leg	9600	15.0
THREE-PHASE FULL-WAVE FIG. 5	8250 per leg	19200	7.5

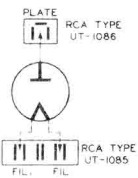
869-A

869-A

HALF-WAVE MERCURY-VAPOR RECTIFIER



TUBE SYMBOL & CONNECTIONS
TO END-MOUNTINGS



APR. 6, 1934.

DATA

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

869-A

HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament*	Coated	
Voltage	5	a-c volts
Current	18	amp.
Overall Length		14-1/4"±1/8"
Maximum Diameter		5-1/16"
Bulb		GT-40
Cap		No. 3905
Base#		No. 3502

Peak Inverse Voltage:

Supply Freq.	*Ambient Temp. Range*	
Up to 150~	15° - 50°C	20000 max. volts
Peak Plate Current		10 max. amp.
Average Plate Current	Averaged over period of 30 sec.	2.5 max. amp.
Tube Voltage Drop		10 approx. volts

* The filament of the 869-A should be allowed to come up to operating temperature before plate voltage is applied. For average conditions the delay is approximately 60 seconds.

\# Base shell is not connected to either filament lead within base.

For *shielding and r-f filter circuits*, refer to Type 871.

The table below classifies suitable rectifier circuits for the 869-A and shows their safe maximum input and maximum output operating conditions. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit.

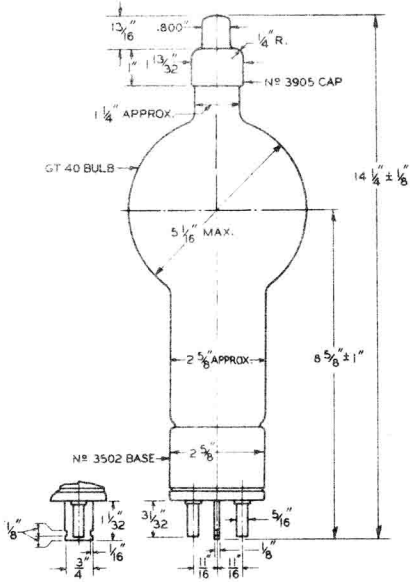
For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	7000 per tube	6300	5.0
SINGLE-PHASE FULL-WAVE (4 tubes) FIG. 2	14000 total	12600	5.0
THREE-PHASE HALF-WAVE FIG. 3	8250 per leg	9600	7.5
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	8250 per leg	9600	15.0
THREE-PHASE FULL-WAVE FIG. 5	8250 per leg	19200	7.5

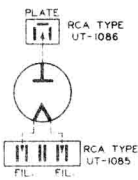
869-A

869-A

HALF-WAVE MERCURY-VAPOR RECTIFIER



TUBE SYMBOL & CONNECTIONS
TO END-MOUNTINGS



APR. 6, 1934.

DATA

RCA RADIOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

870

HALF-WAVE MERCURY-VAPOR RECTIFIER

(FORCED-AIR COOLED)

Heater	Coated Uni-potential Cathode*	
Voltage	5	a-c volts
Current	65	amp.
Overall Length		24-1/2" ± 1/2"
Maximum Diameter		10-1/4"
Bulb		GT-80
Base#		No. 3914

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temp.*		
Up to 150∿	30° - 50°C	7500 max.	volts
Up to 150∿	30° - 45°C	16000 max.	volts
Peak Plate Current		450 max.	amp.
Average Plate Current	Averaged over period of 60 sec.	75 max.	amp.
Tube Voltage Drop		10 approx.	volts

* The cathode should be allowed to come up to operating temperature and the mercury vapor to reach operating pressure before plate voltage is applied. For average conditions, the delay is about 30 minutes depending on the amount and the controlled temperature of the cooling air as well as on the heater-supply transformer characteristics.

The heater-supply transformer should be capable of delivering approximately 400 watts at 5 volts and should maintain this voltage within plus or minus 5%.

Base shell is connected within base to cathode lead.

For *shielding and r-f filter circuits*, refer to Type 872-A.

The table below classifies suitable rectifier circuits for the 870 and shows their safe maximum input and maximum output operating conditions for a peak inverse voltage of 16000 volts. The values are based on sine-wave input and the use of a pure resistance load. If the 870 is to be used under temperature conditions such that the peak inverse voltage is limited to 7500 volts, the a-c input voltage and d-c output voltage values in the table should be multiplied by a factor of 0.47 to give the maximum values for the 7500-volt conditions.

For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS* (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1	5650 per tube	5100	150
SINGLE-PHASE FULL-WAVE (4 tubes) FIG.2	11300 total	10200	150
THREE-PHASE HALF-WAVE FIG.3	6540 per leg	7650	225
THREE-PHASE DOUBLE-Y PARALLEL FIG.4	6540 per leg	7650	450
THREE-PHASE FULL-WAVE FIG.5	6540 per leg	15300	225

* For maximum peak inverse voltage of 16000 volts.

(continued on next page)

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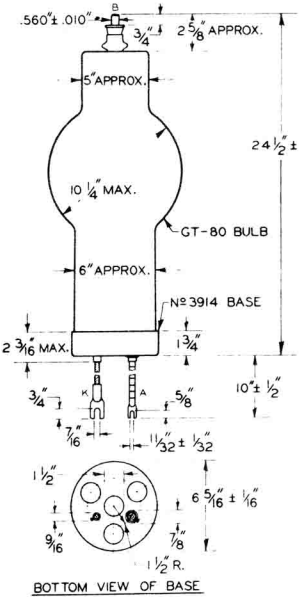
HALF-WAVE MERCURY-VAPOR RECTIFIER

(continued from preceding page)



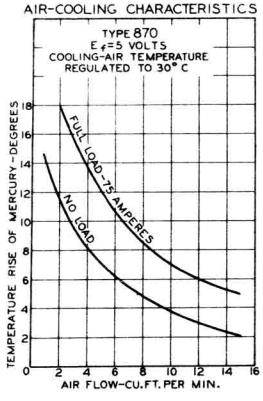
BOTTOM VIEW OF BASE

TUBE SYMBOL AND TERMINAL CONNECTIONS

A - Heater
K - Cathode & Heater
B - Plate

NOTE: Special end-mountings are required.

AIR-COOLING CHARACTERISTICS



NOTE ON AIR-COOLING CURVES

COOLING AIR REGULATED TO TEMPERATURE OF 30°C AND DIRECTED HORIZONTALLY FROM A 1" TO 1 1/2" DIAMETER NOZZLE LOCATED 1/2" ABOVE CATHODE BASE.

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HALF-WAVE MERCURY-VAPOR RECTIFIER

(FORCED-AIR COOLED)

Heater	Coated Uni-potential Cathode*	
Voltage	5	a-c volts
Current	65	amp.
Overall Length		25" ± 1/2"
Maximum Diameter		10-1/4"
Bulb		GT-80
Base#		No. 3914

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temp. Range*		
Up to 150∿	35° - 50°C	7500 max.	volts
Up to 150∿	35° - 40°C	16000 max.	volts
Peak Plate Current		450 max.	amp.
Average Plate Current (Averaged over period of 60 sec.)		75 max.	amp.
Tube Voltage Drop		10 approx.	volts

* The cathode should be allowed to come up to operating temperature and the mercury vapor to reach operating pressure before plate voltage is applied. For average conditions, the delay is about 30 minutes depending on the amount and the controlled temperature of the cooling air as well as on the heater-supply transformer characteristics.

The heater-supply transformer should be capable of delivering approximately 400 watts at 5 volts and should maintain this voltage within plus or minus 5%.

Base shell is connected within base to cathode lead.

For *shielding and r-f filter circuits*, refer to Type 871.

The table below classifies suitable rectifier circuits for the 870 and shows their safe maximum input and maximum output operating conditions for a peak inverse voltage of 16000 volts. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit. If the 870 is to be used under temperature conditions such that the peak inverse voltage is limited to 7500 volts, the a-c input voltage and d-c output voltage values in the table should be multiplied by a factor of 0.47 to give the maximum values for the 7500-volt conditions.

For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS□ (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1	5650 per tube	5100	150
SINGLE-PHASE FULL-WAVE (4 tubes) FIG.2	11300 total	10200	150
THREE-PHASE HALF-WAVE FIG.3	6540 per leg	7650	225
THREE-PHASE DOUBLE-Y PARALLEL FIG.4	6540 per leg	7650	450
THREE-PHASE FULL-WAVE FIG.5	6540 per leg	15300	225

□ For maximum peak inverse voltage of 16000 volts.

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RCA MANUFACTURING COMPANY, INC.

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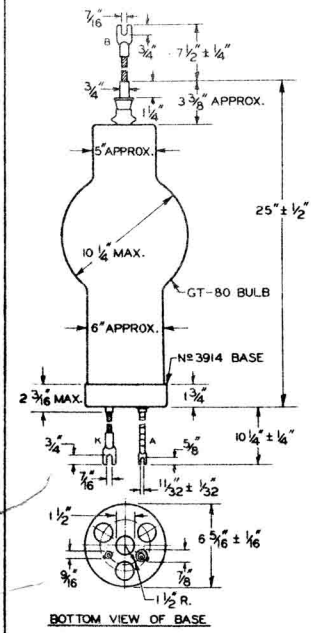
HALF-WAVE MERCURY-VAPOR RECTIFIER



BOTTOM VIEW OF BASE

TUBE SYMBOL AND TERMINAL CONNECTIONS

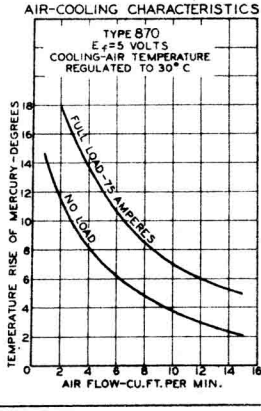
A - Heater
K - Cathode & Heater
B - Plate

NOTE: Special end-mountings are required.

NOTE ON AIR-COOLING CURVES

COOLING AIR REGULATED TO TEMPERATURE OF 30°C AND DIRECTED HORIZONTALLY FROM A 1" TO 1-1/2" DIAMETER NOZZLE LOCATED 1/2" ABOVE CATHODE BASE.

AIR-COOLING CHARACTERISTICS



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HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament *	Coated	
Voltage	2.5	a-c volts
Current	2.0	amp.
Maximum Overall Length		4-1/2"
Maximum Diameter		1-3/16"
Bulb		T-9
Cap		Medium Metal
Base		Small 4-Pin

MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq.	*Condensed Mercury Temp. Range*		
Up to 150 ~	10° - 60°C	5000 max.	volts
Peak Plate Current		0.5 max.	amp.
Average Plate Current		125 max.	ma.
Tube Voltage Drop		15 approx.	volts

* The filament of the 871 should be allowed to come up to operating temperature before plate voltage is applied. For average conditions, the delay is approximately 10 seconds.

Shielding and r-f filter circuits should be provided for the 871 if it is subjected during operation to high-voltage, high-frequency fields. These fields tend to produce breakdown effects in mercury vapor and are detrimental to tube life and performance. External shielding is employed when the tube is in proximity to high-voltage, high-frequency fields. R-F filters are employed to prevent damage caused by r-f currents which might otherwise be fed back into the rectifier tubes.

The table below classifies suitable rectifier circuits for the 871 and shows their safe maximum input and maximum output operating conditions. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit.

For Circuits, refer to 92S-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	1750 per tube	1570	0.25
SINGLE-PHASE FULL- WAVE (4 tubes) FIG. 2	3500 total	3150	0.25
THREE-PHASE HALF-WAVE FIG. 3	2050 per leg	2400	0.375
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	2050 per leg	2400	0.75
THREE-PHASE FULL-WAVE FIG. 5	2050 per leg	4800	0.375

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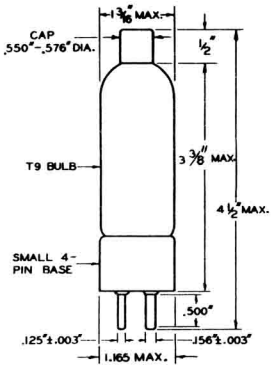
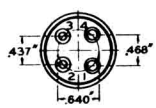
HALF-WAVE MERCURY-VAPOR RECTIFIER

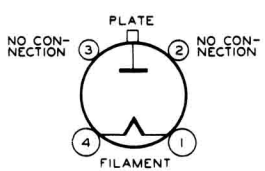




BOTTOM VIEW OF BASE

925-4320R2

TUBE SYMBOL & TOP VIEW
OF
SOCKET CONNECTIONS



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