

650

### SCREEN GRID R-F POWER AMPLIFIER

SCREEN GRII	R-F POWER	AMPLIFIER
	horiated 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	5 ma. 2750	µmhos
Direct Interelectrode	Capacitances (appr	ox.):
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 OPERAT	ING CONDITIONS
	MPLIFIER - Class B	
Carrier conditions per tube		
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	
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 AMPLIETER - (	
Carrier conditions per tube		
D-C Plate Voltage	e en ure - School service de la School de	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. waits
Screen Input		7 max. watts
Plate Dissipation		70 max. watts
Typical Operation:		, and the state of
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.		ge) * See next page.



# 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 \*\*

1250 max. volts D-C Plate Voltage \_400 max. volts D-C Grid Voltage 175 max. ma. D-C Plate Current 40 max. ma. D-C Grid Current 7.5 max. amp. R-F Grid Current 220 max. watts Plate Input 10 max. watts Screen Input 100 max. watts Plate Dissipation Typical Operation: a-c volts 10 10 Filament Voltage 750 1000 1250 volts D-C Plate Voltage volts 175 175 D-C Screen Voltage 175 -150-150volts -150D\_C Grid Voltage D-C Plate Current 160 160 ma. 160 35 35 35 approx.ma. D-C Grid Current

Power Output 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.

10

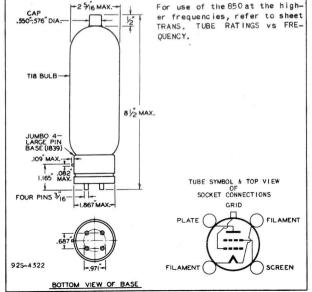
55

10

100

10 approx.watts

130 approx.watts

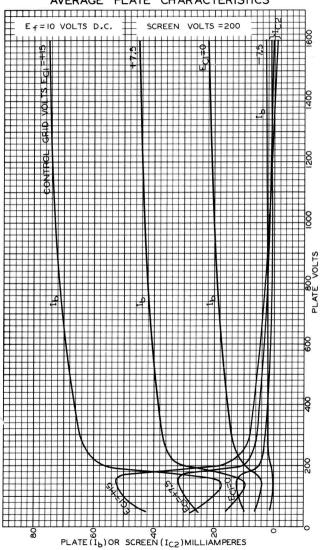


Driving Power\*



# 18%

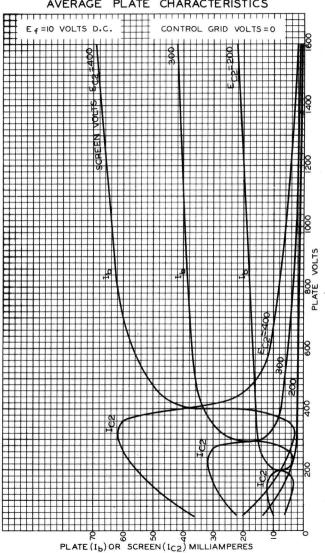
# AVERAGE PLATE CHARACTERISTICS







### CHARACTERISTICS





# 1950

## SCREEN GRID R-F POWER AMPLIFIER

Filament Thor	riated Tungsten			
Voltage	10	a-c	or d-c	
Current	3.25			amp.
Amplification Factor	550 approx.			
Mutual Conductance for				
plate current of 19.5 ma.	2750 µmhos			
Direct Interelectrode Cap	acitances:			
Grid to Plate	O.25 maximum	1.0		
Input	17	цц.		
Output	25	μµ.	f	
Maximum Overall Length				-1/2"
Maximum Diameter				-5/16"
Sulb				T-18
Cap		4000	Medium	
Base		Jumb	o 4-Lar	ge Pin
R-F POWER AMPLIF	TED Class B (T	olonh	227)	
Carrier Conditions; for us				1.0
C Plate Voltage	or when a manufacture		max.	volts
C Plate Voltage C Plate Current				ma.
Plate Dissipation		(0.00)0		watts
Screen Dissipation			max.	watts
R-F Grid Current		6	max.	amp.
Typical Operation:				
Filament Voltage	10	10		volts
D-C Plate Voltage		1250		volts
Screen Voltage	175		approx	
Grid Voltage			approx	
D-C Plate Current	100			ma.
Peak Power Output	120		approx	
Carrier Power Output	30	40	approx	. wat ts
LATE-MODULATED R-F POWER	AMPLIFIER - Cl	ass C	(Telep	hony)
Carrier Conditions; for us				
D-C Plate Voltage				volts
C Plate Current				ma.
Plate Dissipation				watts
Screen Dissipation			max.	watts
R-F Grid Current				amp.
D-C Grid Current		40	max.	ma.
Typical Operation:	10	10	0- 0	volts
				volts
Filament Voltage		100		40119
D-C Plate Voltage	750	140	approx	.volte
D-C Plate Voltage Screen Voltage	125		approx	
D-C Plate Voltage Screen Voltage Grid Voltage	125 -1∞	-100	approx	.volts
D-C Plate Voltage Screen Voltage Grid Voltage D-C Plate Current	125 -100 140	-100 125	approx	.volts
D-C Plate Voltage Screen Voltage Grid Voltage	125 -1∞	-100 125 40	approx	.volts

\* See next page. (continued on next page)





### SCREEN GRID R-F POWER AMPLIFIER

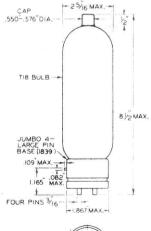
(continued from preceding page)

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

	Key-down	Conatt	ions			
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	Q-C	volts
D-C Plate Voltage		750	1000	1250		volts
Screen Voltage		175	175	175	арргох	volts
Grid Voltage		-150	-150	-150	арргох	volts
D-C Plate Current		160	160	160		ma.
D-C Grid Current*		35	35	35		ma.
Driving Power*		10	10	10		watts

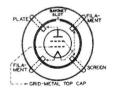
100 130 approx.watts Power Output \* Subject to wide variations depending on the impedance of the load s require more grid current and driving power to obtain the desired output. Low im-High impedance load circuits

55



pedance circuits need less pedance circuits need less grid current and driving power, but rlate 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



The second secon	
Filament Thoriated Tung Voltage 11	gsten 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 Maximum Diameter	17-1/2" ± 1/8" 6-1/8"
Bulb	T-48
Cap	No.1902
Base	No.3117
MAXIMUM RATINGS and TYPICAL	OPERATING CONDITIONS
A_F POWER AMPLIFIER & MOI	DULATOR - 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 3100 5000 ohms
Load Resistance 3700 Power Output 46	3100 5000 ohms 100 160 watts
A-F POWER AMPLIFIER & MOI	
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, vo 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 Load Resistance (pertube) 650	1.4 1.2 amp. 1000 1400 ohms
Effective Load Resistance	1000 1400 Olins
(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 cycl	e of sine-wave form.

<sup>←</sup> Indicates a change



(continued from preceding page)

DE	DOWED	AMDI ICICD		Class	0	Talanhan
K-F	PUWER	AMPLIFIER	-	Class	D	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 750 max. Plate Dissipation watts Typical Operation: Filament Voltage 11 a-c volts 11 D-C Plate Voltage 1500 2000 2500 volts D\_C Grid Voltage -60 -85 -110volts Peak R-F Grid Voltage 150 140 135 volts D-C Plate Current 0.62 0.475 0.39 amp. Driving Power \*\* o 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

2000 max.

0.125 approx.amp.

← Indicates a change

1250 approx.watts

approx.watts

65

volts

-500 max. D-C Grid Voltage volts D-C Plate Current 1 max. amp. D-C Grid Current 0.2 max. amp. R-F Grid Current 8 max. amp. 1800 max. Plate Input watts 500 max. watts Plate Dissipation Typical Operation: 11 11 a-c volts Filament Voltage 1500 2000 volts D-C Plate Voltage D-C Grid Voltage -250 -300volts 525 Peak R-F Grid Voltage 475 volts 0.85 0.9 D-C Plate Current

R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

0.15

75

900

#### Key-down conditions per tube without modulation #

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

D-C Plate Voltage

D-C Grid Current

Driving Power\*\*

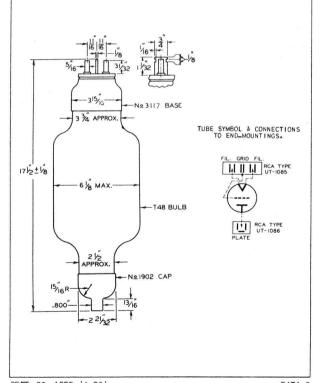
Power Output



(continued	from prece	ding pag	e)	
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 Öutput	900	1250	1700	approx.watts

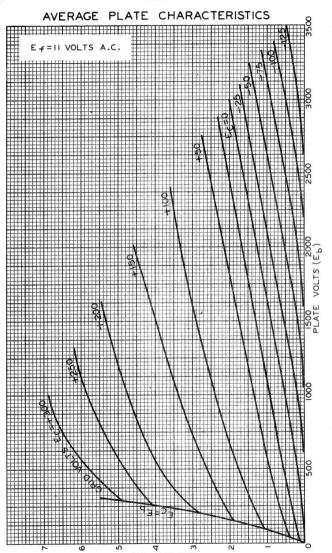
<sup>\*\*</sup> Subject to wide variations as explained on sheet TRANS, TUBE RATINGS.

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



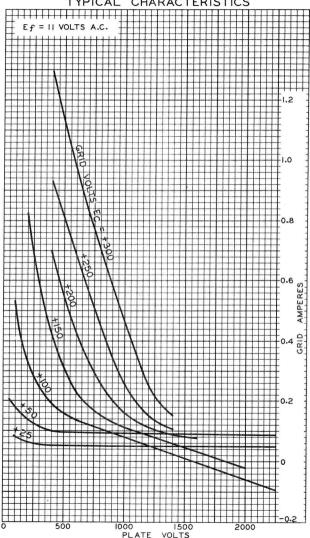
Modulation essentially negative may be used if the positive peak of the positive peak of the audio-frequency envelope does not exceed i15% of the carrier conditions.





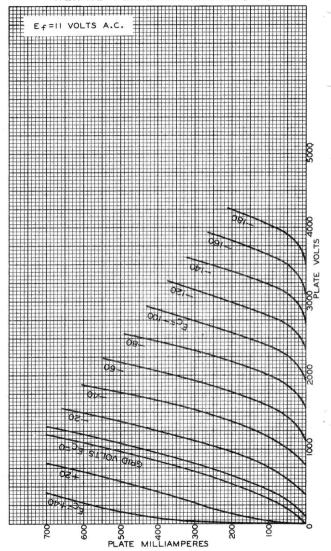


### CHARACTERISTICS





# AVERAGE PLATE CHARACTERISTICS



AUG. 29, 1928

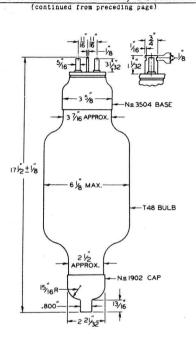
RCA RADIOTRON DIVISION

925-5497

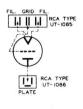


# 85

# MODULATOR, A-F POWER AMPLIFIER, R-F POWER AMPLIFIER, OSCILLATOR (continued from preceding page)

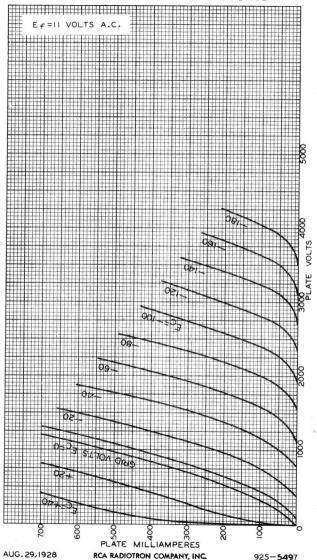


TUBE SYMBOL & CONNECTIONS TO END-HOUNTINGS





# AVERAGE PLATE CHARACTERISTICS



925-5497



185

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

R-F POWER AMPI	JIT I	ck, U	SCILI	AIU	1/
Filament Thoriat	ed Tu	nasten			
Voltage	11		a-c	or d-c	volts
	5.5				amp.
	0.5				
Direct Interelectrode Capac	itano	es (app	rox.):		
Grid to Plate	47		µµ f	Ä	
	5.5		ррі		
	4.5		μμf		
				17-1/2	+1/8"
Overall Length Maximum Diameter					6-1/8"
Bulb					T-48
Cap				No	. 1902
Base					. 3504
pase					
A-F POWER AMPLIFIER	& MC	DULATOR	- Clas	8 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 AMPLIFIES	& MC	DULATOR	- Clas	s B	
D-C Plate Voltage			3000		volts
D-C Plate Current)			-	max.	amp.
Average				max.	watts
Plate Input	quency	cycle	2250	max.	watts
Typical Operation (2 tubes)	1:				
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.
MaxSig. Plate Cur. (per tube	) 850	680	570		ma.
Load Resistance (per tube)	650	1020	1480		ohms
Effective Load Res.	2600	4080	5920		ohms
(plate to plate) Power Output ( 2 tubes )	2200	- 100		approx	
				127	
R-F POWER AMPLIFIER					1
(Carrier Conditions; for use t	orth a	Moautati			
D-C Plate Voltage				max.	volts
D-C Plate Current				max.	ma.
Plate Dissipation				max.	watts
R-F Grid Current			8	max.	amp.
Typical Operation:					
Filament Voltage			11	a-c	volts
(continue	on n	ext page)			



continued	from	preceding	page)	

D-C Plate Voltage	2000	volts
Grid Voltage	-85	approx.volts
D-C Plate Current	475	
Peak Power Output	1 200	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.

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

#### (Key-down Conditions)

D-C Plate Voltage	2500 max. volt:
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	<pre>ii a-c volt:</pre>
D-C Plate Voltage	2000 volts
Grid Voltage	-200 approx.volts
D-C Plate Current	9∞ ma.
Power Output	1250 approx. watt:

(continued on next page)

1000 approx.watts

Power Output



# 85

# R-F POWER AMPLIFIER, OSCILLATOR

R-F POWER	AMPLIFIE	ck, U	SCIL	LAIU	11
Filament	Thoriated Tun	gsten			walta
Voltage Current	3.25		a-c	or d-c	amp.
Amplification Factor	12				
Direct Interelectrode	Capacitances	(appro	×.):		
Grid to Plate	2.6				μμf
Grid to Filament Plate to Filament	1.9 1.0				μμf μμf
Maximum Overall Lengt	7			1	3-3/4"
Maximum Radius					1-1/4"
Bulb			GT 1edium	-30 wi	
Base					ayonet
A-F POWER A	MPLIFIER & MO	DULATOR			
D-C Plate Voltage			3000	max.	volts ma.
MaxSig. D-C Plate ( MaxSig. Plate Input	,ur.↑ *			max.	ma. watts
Plate Dissipation*	•		100	max.	watts
Typical Operation (2)	tubes):	_			
Unless otherwise Filament Voltage	specified, v	alues a 10	re for	2 tubes	volts
D-C Plate Voltage		2000	3000	-	volts
D-C Grid Voltage		-155	-250		volts
Peak A-F Grid Volta Zero-Sig. D-C Plate		600 22	780 14		volts ma.
MaxSig. D-C Plate	Cur.	180	160		ma.
Load Resistance (pe	r tube)	5500	10250		ohms
Effective Load Res.	te)	22000	41000		ohms
MaxSig. Driving I	ower	3.5 220		approx approx	
MaxSig. Power Out			320	appi cx	·watts
* Averaged over any audio			- 1 6	20.	
	AMPLIFIER - C1				25.2
Carrier conditions per t	ube for use with	a max.			
D-C Plate Voltage			3000 85	max.	volts ma.
D-C Plate Current R-F Grid Current				max.	amp.
Plate Input				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 Volta	age	200 60	225 43		ma.
D-C Plate Current D-C Grid Current	4	1		approx	
Driving Power **		10	7	approx	.watts
Power Output		30	40	approx	.watts
At crest of a-T cycle	continued on nex	t page)			
SEPT 30 1936					DATA



# R-F POWER AMPLIFIER, OSCILLATOR

(continued from preceding page)

Carrier conditions per tube for	use with	а тах.	modulati	on jact.	of 1.0
D-C Plate Voltage			2000	max.	volts
D-C Grid Voltage			-800	max.	volts
D-C Plate Current				max.	ma.
D-C Grid Current				max.	ma.
R-F Grid Current			1.7	max.	amp.
Plate Input				max.	watts
Plate Dissipation			67	max.	watts
Typical Operation:		75.114			1.
Filament Voltage		10		a-c	volts
D-C Plate Voltage		1500			volts
D-C Grid Voltage		-400			volts
Peak R-F Grid Voltage		650			volts
D-C Plate Current		70			ma.
D-C Grid Current **		30			
Driving Power **		20		approx	
Power Output		45	75	approx	.watts

### R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down Conditions per tube without modulation#

			volts
	-800	max.	volts
			ma.
	40	max.	ma.
	10	max.	amp.
			watts
	100	max.	watts
	-		3
10		a-c	volts
2500	3000		volts
-450	-600		volts
700	850		volts
90	85		ma.
15	15	approx	.ma.
10	12	approx	.watts
135	165	approx	.watts
	-450 700 90 15 10	-800 150 40 10 300 100 2500 3000 -450 700 850 90 85 15 15 10 12	2500 3000 -450 -600 700 850 90 85 15 15 approx 10 12 approx

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

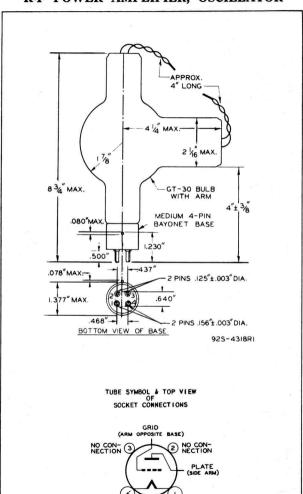
For use of the 852 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY

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



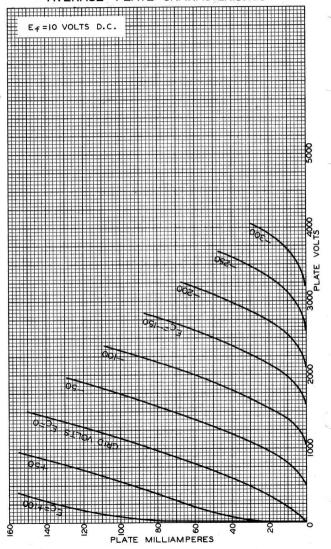


# R-F POWER AMPLIFIER, OSCILLATOR



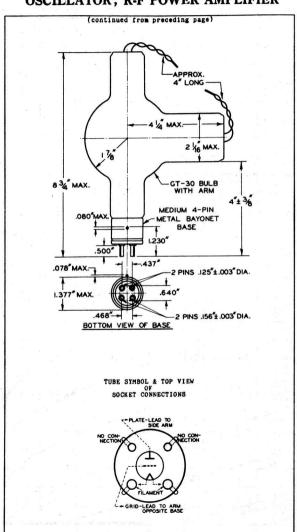


# AVERAGE PLATE CHARACTERISTICS



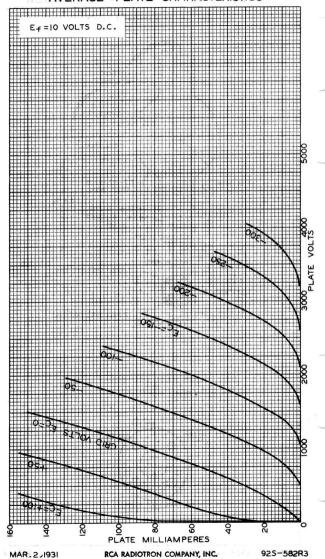


# OSCILLATOR, R-F POWER AMPLIFIER





# AVERAGE PLATE CHARACTERISTICS





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

#### MAXIMUM RATINGS

Peak Inverse Voltage:

Condensed Mercury Supply Freq. Temperature Range

10000 max. Up to 150~ 25° - 65°C volts Up to 150~ 300 - 4000 22000 max. volts 40 max. Peak Plate Current 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 be-fore plate voltage is applied. For average conditions, the delay is approximately 10 minutes.

# Base shell is connected within base to cathode lead.

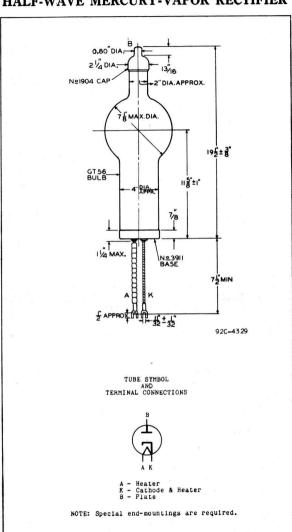
\*\*\* For plate potentials in excess of 10000 voits peak inverse, tempera-ture-regulated forced-air cooling must be employed.

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

The table below classifies suitable rectifier circuits for the 857 and 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.

A-C INPUT VOLTS	D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
7750 per tube	7000	20
15500 total	14000	20
9000 per leg	10500	30
9000 per leg	10500	60
9000 per leg	21000	30
	A-C INPUT VOLTS  7750 per tube  15500 total  9000 per leg  9000 per leg	A-C   INPUT VOLTS





Heater	Coated	Uni-potential	Cathode*		
Voltage		5		a-c	volts
Current		30			amp.
Overall Length				19-1/2"	± 3/8"
Maximum Diamete	er				7-1/8"
Bulb					GT-56
Cap				No	. 1904
Base#				No	. 3911
Peak Inverse V		Temp. Range			
Up to 150~ Up to 150~	15°	- 50°C - 40°C	10000	max.	volts volts
Peak Plate Curi	rent		40	max.	amp.

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.

10 max.

10 approx. volts

amp.

# Base shell is connected within base to cathode lead.

Average Plate Current { Averaged over period of 30 sec.}

maximum values for the 10000-volt conditions.

Tube Voltage Drop

\*\* For plate potentials in excess of 10000 volts peak inverse, erature-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

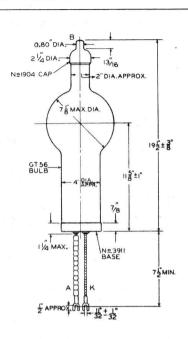
For Circuits, refer to 928-4315 (page backing Type 872)

CIRCUIT	MAXIMUM A-C INPUT VOLTS (RMS)	APPROX.  D-C OUTPUT VOLTS  TO FILTER	MAXIMUM D-C LOAI CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	7750 per tube	7000	80
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.







TUBE SYMBOL
AND
TERMINAL CONNECTIONS



A - heater K - Cathode & Heater B - Plate

NOTE: Special end-mountings are required.



62/4

# HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament*	Coated	
Voltage	5	a-c volts
Current	30	amp.
Overall Length	125	19-1/2" ± 3/8"
Maximum Diameter		7-1/8"
Bulb		GT-56
Cap		No.1904
Base #		No. 3911

#### MAXIMUM RATINGS

Peak Inverse Voltage:

Condensed Mercury Supply Freq. Temperature Range

25° - 60°C Up to 150~ Up to 150~ 300 - 4000

Peak Plate Current Average Plate Current { "Averaged over } sec. } 10000 max. 22000 max.\*\* amp. 40 max. 10 max. amp.

volts

volts

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 925-4315, backing Type 872.

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

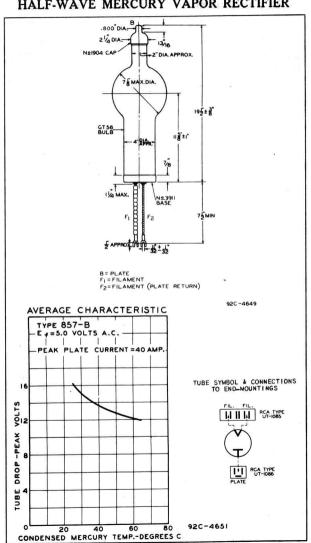
The table below classifies suitable rectifier circuits for the 857-8 and shows their safe maximum input and maximum output operating conditions for a peak inverse voltage of 22000 volts. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit. If the 857-8 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	A-C INPUT VOLTS (RMS)	D-C OUTPUT VOLTS	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.	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	<b>96</b> 00	60
THREE-PHASE FULL-WAVE FIG.5	8250 per leg	19200	30

For maximum peak inverse voltage of 22000 volts.







JAN. 15, 1937

RCA RADIOTRON DIVISION RCA MANUFACTURING COMPANY, INC. TENTATIVE DATA



# OSCILLATOR, R-F POWER AMPLIFIER

	WATER COULE	ניטיב			
Filament Voltage Current	Tungsten 22 52	a	c or	d–c	volts amp.
Amplification Factor	42				
Direct Interelectrode Ca Grid to Plate Grid to Filament Plate to Filament	pacitances 18 16 2	(approx.):			µµf µµf µµf
Maximum Overall Length Maximum Radius Base Water Jacket				7	1-1/2" 7-1/2" None 1-290
MAY IMIN DATINGS	J TVDICAL (	DEDATING COL	IN IT	LUNG	

#### 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, ve		2 tube:	s.
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.

Max-Signal Power Output Averaged over any audio-frequency cycle.

Effective Load Res. (plate to plate)

Load Resistance (per tube)

Max-Signal Driving Power

# R-F POWER AMPLIFIER - Class B Telephony

1800

7200

Carrier conditions per	tube for	use	with	a nax.	modulat i	on 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			volts
			000	4 4 000	1 10000		-11-

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)

ohms

ohms

115 approx.watts

26.5 approx.kw



# OSCILLATOR. R-F POWER AMPLIFIER

(continued from preceding page)

Driving Power \*\* 0 25 70 85 approx.watts 1.5 3.3 5.6 approx.kw Power Output

O 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 12000 max. D-C Plate Voltage volts D-C Grid Voltage -3000 max. volts D-C Plate Current D-C Grid Current 1.0 max. amo. 0.25 max. amp. R-F Grid Current 48 max. amp. 12 max. Plate Input kw Plate Dissipation 10 max. kw Typical Operation: Filament Voltage 22 22 22

a-c volts D-C Plate Voltage 8000 10000 12000 volts -1000 D-C Grid Voltage -900 -950volts 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.

180 200 Driving Power 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 #

20000 max. volts D-C Plate Voltage -3000 max. volts D-C Grid Voltage 2.0 max. D-C Plate Current amp. 0.25 max. D-C Grid Current amp. 60 max. R-F Grid Current amp. 40 max. kw Plate Input 20 max. Plate Dissipation kw

Typical Operation: 22 22 a-c volts Filament Voltage 10000 15,000 volts D-C Plate Voltage 18000 D-C Grid Voltage -1000-1100-1200volts 2500 Peak R-F Grid Voltage 2200 2600 volts D-C Plate Current 1.4 1.8 1.8 0.13 D-C Grid Current 0.10 0.10 approx.amp. 250 Driving Power \*\* 275 250 approx.watts 9 18 22.4 approx.kw Power Output

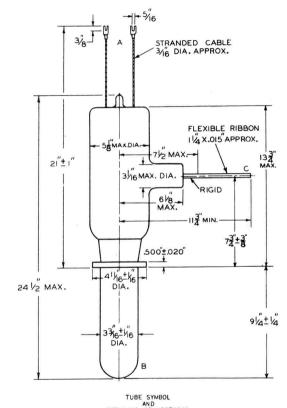
# Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed HIDS of the carrier con-ditions.

\*\* 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.







AND TERMINAL CONNECTIONS



A - Filament B - Plate C - Grid

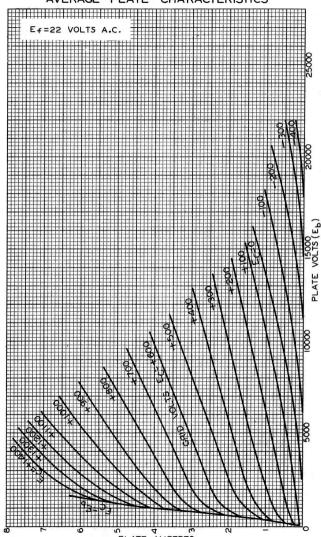
*&* 

# OSCILLATOR, R-F POWER AMPLIFIER

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

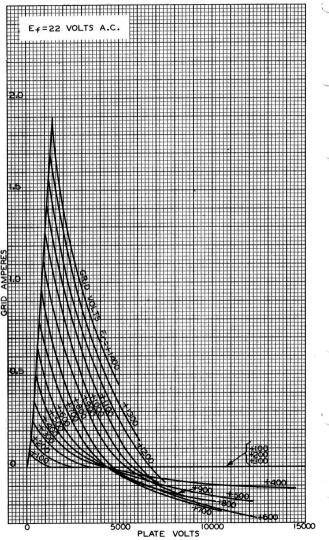


# AVERAGE PLATE CHARACTERISTICS





### TYPICAL CHARACTERISTICS





## SCREEN GRID R.F POWER AMPLIFIER

Filament	Thoriated Tu				
Voltage	10	a-c	or	d-c	volts
Current	3.25				amp.
Amplification Factor	200 a	pprox.			
Transconductance for				*	
plate current of 50	ma. 1100				µmh os
Direct Interelectrode					
Grid to Plate	0.08*m	ax.			μμf
Input	7.75				μμf
Output	7.5				μμf
Maximum Overall Lengt	h				8-3/4"
Maximum Radius					1-1/4"
Bulb		G <sup>-</sup>	-31	0 w i 1	th arm
Base	Me	edium 4-Pin Cera	am i d	c, Ba	ayonet
MAXIMUM RATINGS	and TYPICAL	OPERATING CON	) IT	ONS	
R-F POWER	AMPLIFIER - C	lass B Telepho	ıу		

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

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

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

See next page.

D-C Grid Current With external shielding.

(continued on next page)

70

30

67

30

30 approx.ma.



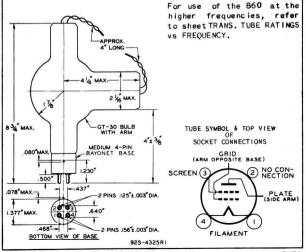


# SCREEN GRID R-F POWER AMPLIFIER (continued from preceding page)

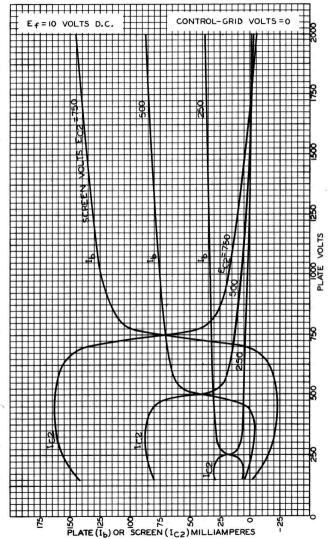
Driving Power ** Power Output			15 45	15 60		approx.	
R-F POWER AMPLIFI	ER &	OSC	LLAT	OR - Class	s C Te	elegraph	ny
Key-down condit	ions	per	tube	wit hout	modul	lation#	
D-C Plate Voltage					3000		volts
D-C Grid Voltage						max.	volts
D-C Plate Current						max.	ma.
D-C Grid Current						max.	ma.
R-F Grid Current						max.	amp.
Plate Input						max.	watts
Screen Input						max.	watts
Plate Dissipation					100	max.	watts
Typical Operation:							(20)
Filament Voltage	10	)	10	10	10		volts
D-C Plate Voltage	1500	) 2	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 **	4.5	5	15	15	15	approx.	.ma.
Driving Power**		7	7	7	7	approx	
Power Output	60	)	100	135	165	approx	.watts

<sup>#</sup> Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed I15% of the carrier conditions.

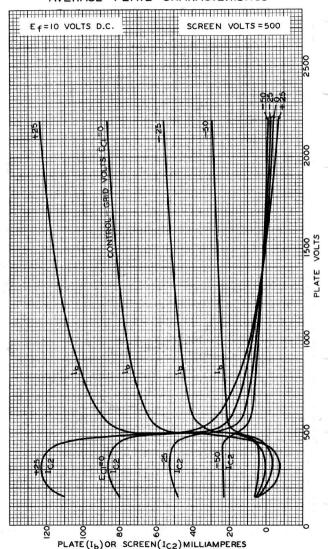
<sup>\*\*</sup> Subject to wide variations as explained on sheet TRANS. TUBE RATINGS.













Filament	Thoriated Tungsten		
Voltage	11	a-c or d-c	volts
Current	10		amp.
Amplification Factor	. 300 approx.		
Transconductance for			
plate current of 130	0 ma. 2100		µmh os
Direct Interelectrode	e Capacitances (approx	.):	
Grid to Plate	0.10*max imum		μμf
Input	14.5		μμf
Output	10.5		μμf
Overall Length		17-3/32" ±	1/8"
Maximum Radius			-5/8"
Bulb		GT-56 wit	
Cap (opposite filamen	nt base)		.3909
Cap (on side of bulb	)	No	.3910
Base		No	.3503

#### MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS

### R-F POWER AMPLIFIER - Class B Telephony

use with	а тах. т	odulatio	n factor	of 1.0
		3500	max.	volts
		250	max.	ma.
		8	max.	amp.
		600	max.	watts
		35	max.	watts
		4 00	max.	watts
11	11	11	a-c	volts
2500	3000	3500		volts
500	500	500		volts
-60	-60	-60		volts
250	245	215		volts
190	175			ma.
4	4			
20	15			
140	160	175	approx	.watts
	11 2500 500 -60 250 190 4 20	11 11 2500 3000 500 500 -60 -60 250 245 190 175 4 4 20 15	3500 250 8 600 35 400 11 11 11 2500 3000 3500 500 500 500 500 -60 -60 -60 250 245 215 190 175 150 4 4 4 20 15 15	2500 3000 3500 500 500 500 -60 -60 -60 250 245 215 190 175 150 4 4 4 approx 20 15 15 approx

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 D-C Plate Current D-C Grid Current R-F Grid Current	3000 max. V -1000 max. V 300 max. m 75 max. m	volts volts ma. ma. amp.
Plate Input  * with external shielding.	650 max. <b>v</b>	vatts

See next page. (continued on next page)





from preces	ding page	e)		- 1
		30	max.	watts
		270	max.	watts
11	11	11	a-c	volts
2000	2500	3000		volts
425	400	375		volts
-250	-225	-200		volts
675	625	575		volts
250	220	200		ma.
65	60	55	approx	.ma.
45	40	35		
285	340	400	approx	.watts
	11 2000 425 -250 675 250 65 45	11 11 2000° 2500 425 400 -250 -225 675 625 250 220 65 60 45 40	11 11 11 2000 2500 3000 425 400 375 -250 -225 -200 675 625 575 250 220 200 65 60 55 45 40 35	30 max. 270 max.  11 11 11 a-c 2000 2500 3000 425 400 375 -250 -225 -200 675 625 575 250 220 200 65 60 55 approx 45 40 35 approx

#### R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

#### Key-down conditions per tube without modulation #

25.00 ----

.....

D-C Plate Voltage			3500	max.	voits
D-C Grid Voltage			-1000		volts
D-C Plate Current				max.	ma.
D-C Grid Current				max.	ma.
R-F Grid Current				max.	amp.
Plate Input				max.	watts
Screen Input				max.	watts
Plate Dissipation			4 00	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	
Driving Power **	30	30		approx	
Power Output	400	600	700	approx	.watts

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

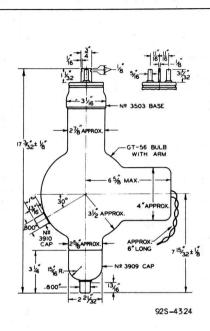
conditions.

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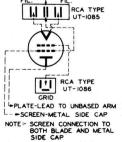
Subject to wide variations as explained on sheet TRANS, TUBE RATINGS.

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





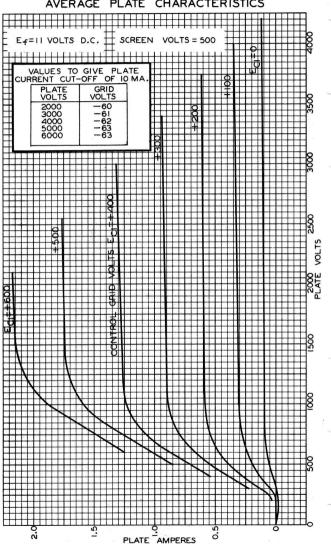
TUBE SYMBOL & CONNECTIONS
TO END-MOUNTINGS





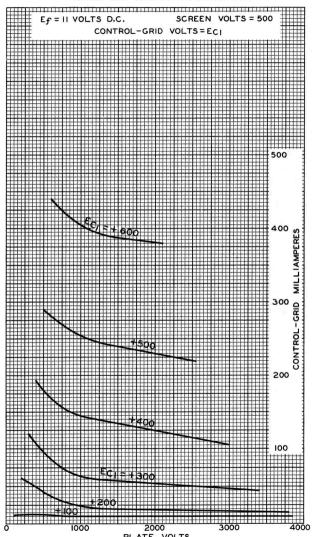


#### PLATE CHARACTERISTICS AVERAGE



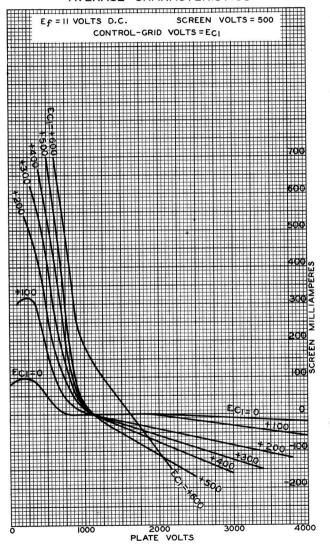


#### AVERAGE CHARACTERISTICS





#### AVERAGE CHARACTERISTICS





## 1962

## OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

(WATER & FORCED-AIR COOLED)

Filament	Tungste	n		- Tal 15	
Voltage Current	33 207			a-c	volts
The state of the s	48				amp.
Amplification Factor		,	i		
Direct Interelectrode		s (appro	x.):		
Grid to Plate Grid to Filament	75 52				μμf
Plate to Filament	2				μμf
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					μμf O 2 (O"
Maximum Overall Lengt	:h			0	0-3/8" 10"
Maximum Radius Base (with nozzle for al	r cooling of fi	lamont co	-11	N	0.3908
Water Jacket (with noz					T-1289
MAXIMUM RATINGS					1-1200
This tube can often b					oltage.
as explained on she					
	MPLIFIER & MC				
PROFILE PARTY WAS TO SEE THE PROFILE OF THE PARTY OF THE	WILLITER & MIC	DULATOR	15000		volts
D-C Plate Voltage Max-Signal D-C Plate	Cur. *			max.	amp.
Max-Signal Plate Inpu	t *			max.	kw
Plate Dissipation*				max.	kw
Typical Operation - 2	tubes:				
Unless otherwise		alues ar	e for	2 tubes	
Filament Voltage	12. R. C.		33		volts
D-C Plate Voltage			12000		volts
D-C Grid Voltage				approx	
Peak A-F Grid-to-Gr	id Voltage			approx	
Zero-Signal D-C Pla			3		amp.
Max-Signal D-C Plat	e Current		13 450		amp.
Load Resistance (pe Effective Load Resis	r tube/				ohms
Max-Signal Driving	Power	to plate	450	approx	
Max-Signal Power Ou			90	approx	
* Averaged over any audio	,	i i		SPP. O.	
	MPLIFIER - C		alenho	nv	
Carrier conditions per tu					of 1.0
D-C Plate Voltage			20000		volts
D-C Plate Current				max.	amp.
R-F Grid Current				max.	amp.
Plate Input				max.	kw
Plate Dissipation				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 Volta	ge <sup>o</sup> 1000	1250	1500	approx.	volts
O At crest of a-f cycle	with modulation continued on ne		1 1.0.		



862

## OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

	(continued	from prece	ding pag	(e)	
	D-C Plate Current	2.8	3.5	4.2	amp.
	Driving Power O **	0.5	0.75	1.1 app	rox.kw
	Power Output	11	17.5	25 app	rox.kw
	PLATE-MODULATED R-F POWE	R AMPLIF	IER - C	lass C Tel	ephony
^	arrier conditions per tube for	r use with	a max.	modulation for	act. of 1.0

12000 max. volts D-C Plate Voltage -3000 max. volts D-C Grid Voltage 5.0 max. amp. D-C Plate Current 1.25 max. D-C Grid Current amp. 48 max. amp. R-F Grid Current 60 max. kw Plate Input 50 max. kw Plate Dissipation Typical Operation:

33 33 d-c volts Filament Voltage 10000 12000 8000 volts D-C Plate Voltage -750-800 approx.volts -700D-C Grid Voltage 1700 1850 2000 approx.volts Peak R-F Grid Voltage D-C Plate Current 4.5 amp. 4 approx.amp. 1 1 D\_C Grid Current

### R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy Key-down conditions per tube without modulation\*

,					
D-C Plate Voltage D-C Grid Voltage			20000 -3000		volts volts
D-C Plate Current			10	max.	amp.
D-C Grid Current				max.	amp.
R-F Grid Current				max.	amp.
Plate Input				max.	kw
Plate Dissipation			100	max.	kw
Typical Operation: Filament Voltage	33	33	33	d-c	volts
D.C. Plato Voltage	12000	15000	18000		volts

U-C Plate Voltage -900 -1000 approx.volts -800 D-C Grid Voltage 2050 2300 2550 approx.volts Peak R-F Grid Voltage D-C Plate Current 6.25 7.5 8.33 amp. 0.85 0.9 approx.amp. 0.8 D-C Grid Current 2 2.4 approx.kw Driving Power \*\* 1.6 50 75 100 approx.kw Power Output

- # Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed II5% 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.

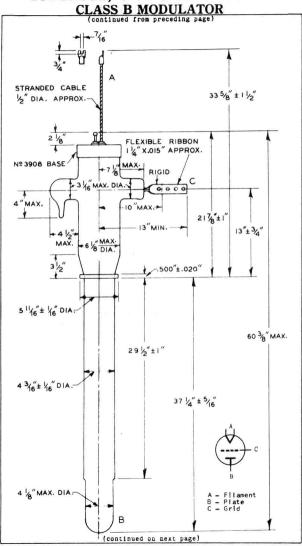
For use of the 862 at the higher frequencies, refer to sheet TRANS. TUBE RATINGS vs FREQUENCY.

(continued on next page)

38



OSCILLATOR, R-F POWER AMPLIFIER

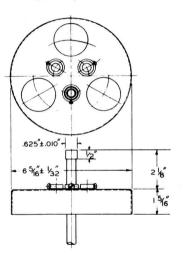




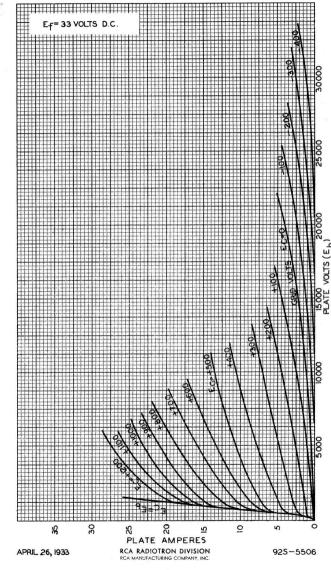


# OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR (continued from preceding page)

Nº 3908 BASE OUTLINE



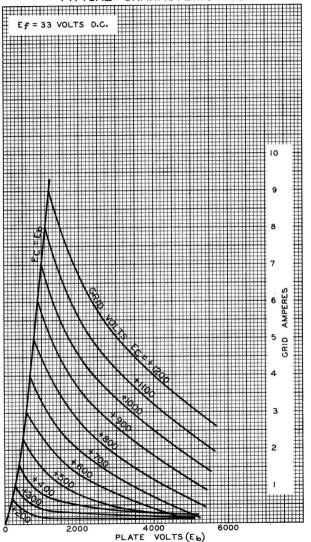






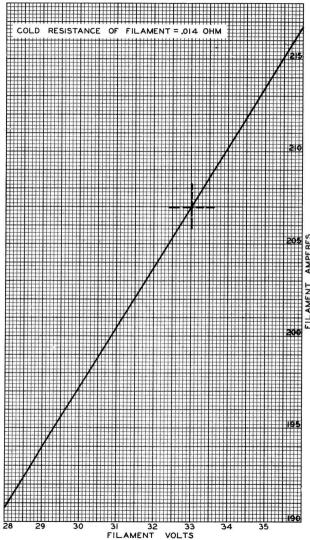


#### TYPICAL CHARACTERISTICS





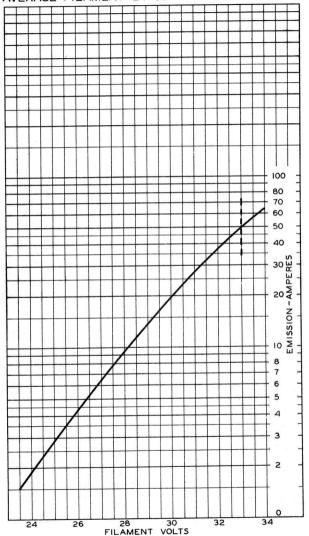
#### AVERAGE FILAMENT CHARACTERISTIC













# 663

## OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

(WATER COOLED)

1000					
Filament Voltage	Tungster 22	1	a-c	or d-c	volts
Current	52				amp.
Amplification Factor	50				
Direct Interelectrode Capac	citances	(appro	x.):		
Grid to Plate	27				put
Grid to Filament	18				PHE
Plate to Filament	2				μμf
Maximum Overall Length				2	0-1/4"
Maximum Radius					6-1/2"
Base					lo.3906 1285-A
Water Jacket		0DED 4 T 1	NO 00M	5.00	-12 W-A
MAXIMUM RATINGS and T					
This tube can often be operated as explained on sheet TYP	sted wit	h reduc	ed file	ament v	oltage
1					OUR.
A_F POWER AMPLIFI	ER & MUI	DULATUR			30
D-C Plate Voltage	. *		15000		volts
Max-Signal D-C Plate Currer	nt			max.	amp. kw
Max-Signal Plate Input *   Plate Dissipation *				max.	kw
Typical Operation - 2 tubes			7.5	max.	V.M.
Unless otherwise speci		ilues ai	e for	2 tubes	
Filament Voltage	22	22	22		volts
D-C Plate Voltage	6000	10000	12500		volts
D-C Grid Voltage	0	-110	-190		volts
Peak A-F Grid-to-Grid Vol	t. 1200	1620	1530		volts
Zero-Signal D-C Plate Cur.		0.5	0.4		amp.
Max-Signal D-C Plate Cur.	2.5	3.2	2.8		amp.
Load Resistance (per tube)	1050	1600	25 00		ohms
Effective Load Resistance	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-freque	ency cycl	e.			
R_F POWER AMPLIF	IER - CI	ass B	elepho	ny	
Carrier conditions per tube for	use with	a max. 1	wdulat i	on fact.	of 1.0
D-C Plate Voltage			15000		volts
D-C Plate Current			1.0	max.	amp.
R-F Grid Current				max.	amp.
Plate Input				max.	kw
Plate Dissipation			10	max.	kw
Typical Operation:	-	-		21 22	
Filament Voltage	22	22	22	a-c	volts
D-C Plate Voltage	6000	10000 -125	14 000 -210		volts
D-C Grid Voltage Peak R-F Grid Voltage	300	470	510		volts
	ed on nex	140400	510		+0113
NOV 7 1935 (9_36)					DATA

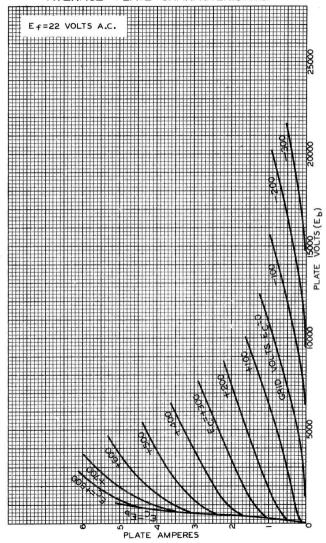


### OSCILLATOR, R-F POWER AMPLIFIER, CLASS B MODULATOR

CLASS B MODULATOR					
	from prec		ge)		NO ANCE
D-C Plate Current	0.67	0.93	0.95	11 2 7 7 7 7 7	amp.
Driving Power 0 **	65	50		approx	
Power Output	1	2.5	4	approx.	. KW
O At crest of a-f cycle with m	odulation	factor o	f 1.0.		
PLATE-MODULATED R-F POW	ER AMPLIE	FIER - (	Class C	Teleph	ony
Carrier conditions per tube fo	r use with	a max.	modulati	on fact.	of 1.0
D-C Plate Voltage			10000		volts
D_C Grid Voltage			-3000		volts
D_C Plate Current				max.	amp.
D_C Grid Current			0.25		amp.
R_F Grid Current				max.	amp.
Plate Input				max.	kw
Plate Dissipation				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.	
Driving Power **	310	350	260	approx.	
Power Cutput	3.5	5	6	approx.	
117 - 117 -		-			
R-F POWER AMPLIFIER &					
Key-down conditions	per tube	without	t modul	ation #	
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				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		
# Modulation essentially negative audio-frequency envelope	tive may t	e used !	f the po	sitive p	eak of
ditions.					
** Subject to wide variations	as explaine	ed on she	et TRANS	. TUBE RA	TINGS.
For use of the 863 at the				efer to	sheet
TRANS. TUBE	RATINGS V	s FREQU	JENCY.		
	Service	earestern and security			

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



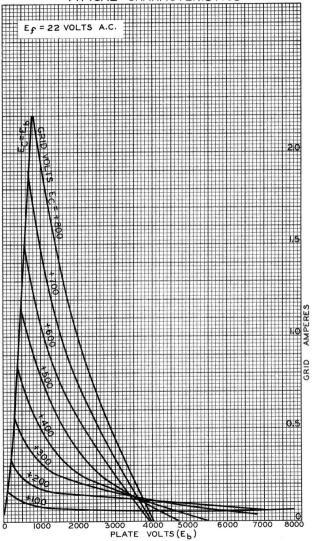


1863





#### TYPICAL CHARACTERISTICS







### AMPLIFIER LOW MICROPHONIC DESIGN

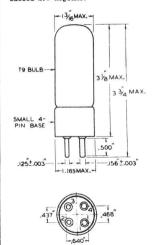
LOW	WICKOT HOTTIC DESIGN	
Filament	Coated	
Voltage	1.1	d-c volts
Current	0.25	amp.
Direct Interelectrode	Capacitances:	
Grid to Plate	5.3	μμf
Grid to Filament	3.3	μμf
Plate to Filament	2.1	µµf
Maximum Overall Lengt	t h	3-3/4"
Maximum Diameter		1-3/16"
Bulb		T-9
Base		Small 4-Pin

#### AMPLIFIER - Class A

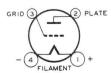
Operating Conditions and Characteristics:

Second to the second se				
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		umhos
Plate Current	2.9	3.5		ma.

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



TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS

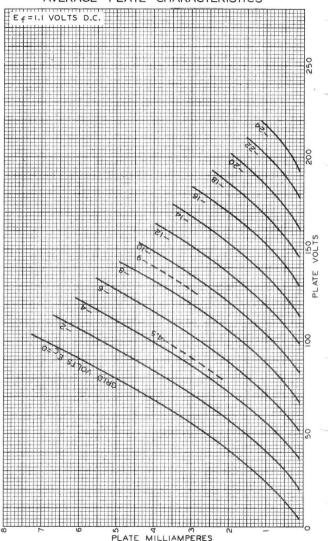


BOTTOM VIEW OF BASE

92C-451R3









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

750 max.

volts

D-C Plate Voltage D-C Screen Voltage 175 max. volts D-C Plate Current 30 max. ma. R-F Grid Current 4 max. amp. 22.5 max. watts Plate Input 3 max. watts Screen Input 15 max. watts Plate Dissipation Typical Operation: a-c volts 7.5 7.5 Filament Voltage 500 750 volts D-C Plate Voltage 125 125 volts D-C Screen Voltage -30 volts -30D-C Grid Voltage 30 22 ma. D-C Plate Current 5 3 approx.ma. D-C Grid Current Driving Power 0 \*\* 2 1.5 approx.watts 3 4.5 approx.watts Power Output

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

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

With external shielding.

See next page.

(continued on next page)





(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		па.
D-C Grid Current **	11	9	approx	.ma.
Driving Power **	3	2.5	approx	
Power Output	8.5		approx	

#### R-F POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

### Key-down conditions per tube without modulation\*

hey-wount condition	ons por					
D-C Plate Voltage				750	max.	volts
D-C Screen Voltage				175	max.	volts
D_C Grid Voltage					max.	volts
D-C Plate Current				60	max.	ma.
D-C Grid Current				15	max.	ma.
R-F Grid Current					max.	amp.
Plate Input					max.	watts
Screen Input					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		approx	
Driving Power **	2.5	2.0	1.2		approx	
Power Output	8.5	10	14	16	approx	.watts

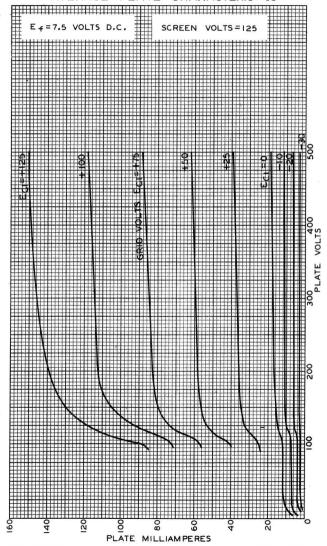
<sup>\*\*</sup> Subject to wide variations as explained on sheetTRANS. TUBE RATINGS.

\* Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed II5% of the carrier conditions.

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



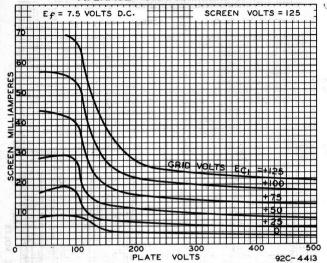
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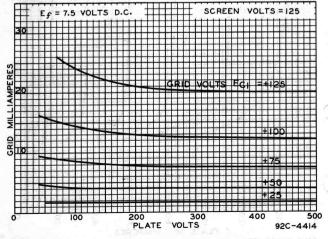




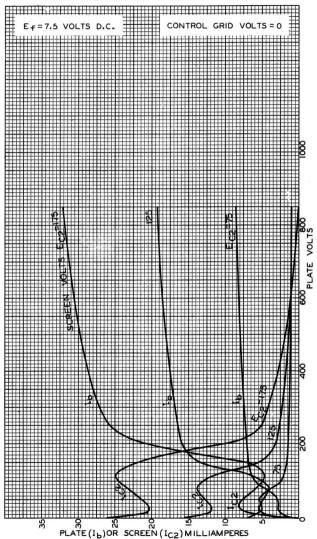
#### AVERAGE CHARACTERISTICS



#### AVERAGE CHARACTERISTICS

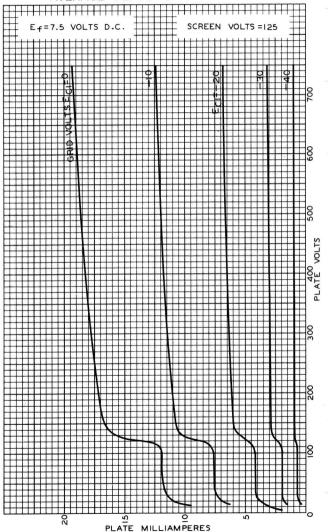




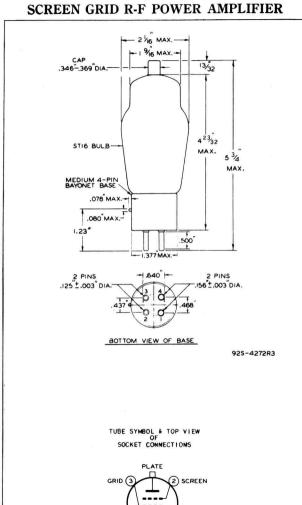






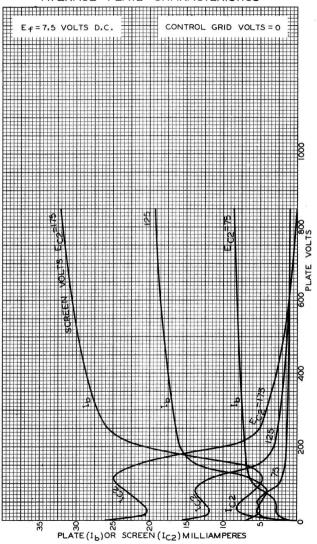
















SCREEN GRIL	R-F POWER	AWI	LIF	IEK
Filament Th	oriated Tungsten			
Voltage	7.5	a-c	or d-	c volts
Current	2.0			amp.
Amplification Factor	150 approx.			
Mutual Conductance fo				
plate current of 18 ma.	750 µmhos			
Direct Interelectrode				
Grid to Plate	O. 10 maximum	μμί		
Input	8.5 8.5	μμf		
Output		μμí		
Maximum Overall Lengt	h			6-1/4"
Maximum Diameter				?-3/16" S-17
Bulb			0 1	S-17 l Metal
Cap	Mad			Bayonet
Base	med	llum 4	-PIN	nayone t
	LIFIER - Class B (T			
(Carrier Conditions; jos	use with a Modulation	Facto	r up to	1.0)
D-C Plate Voltage		750	max.	volts
D-C Plate Current			max.	ma.
Plate Dissipation			max.	watts
Screen Dissipation		-	max.	watts
R-F Grid Current		4	max.	amp.
Typical Operation:				
Filament Voltage	7.5	7.5	(22)	c volts
D-C Plate Voltage	500 125			x.volts
Screen Voltage	-30			x.volts
Grid Voltage D-C Plate Current	30	22	appro	ma.
Peak Power Output	12		annto	x.watts
TO ANGLES PROGRAMMENT AND AND ADDRESS OF THE PARTY OF THE				x.watts
Carrier Power Outpu		4.5	пррто.	A. Watts
PLATE-MODULATED R-F P				
(Carrier Conditions; fo	r use with a Modulation			
D-C Plate Voltage			max.	volts
D-C Plate Current			max.	ma.
Plate Dissipation			max.	watts
Screen Dissipation			max.	watts
R-F Grid Current			max.	amp.
D-C Grid Current		15	max.	ma.
Typical Operation:	7.5	7.5		c volts
Filament Voltage		500		volts
D-C Plate Voltage	375			
Screen Voltage	125			x.volts
Grid Voltage	-12O 5O	40	appro	x.volts
D-C Plate Current	11	9		na.
D-C Grid Current*	3	2.5		watts
Driving Power*	8.5		annra	x.watts
Power Output * See next page.	0.3	10	CPPIO	
	netened on neve pagel			



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#### SCREEN GRID R-F POWER AMPLIFIER

(continued from preceding page)

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

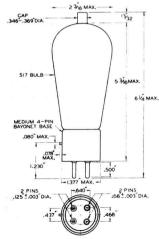
(Key-down Congitions)

	ney-wount co	nastso	1137			
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	Q-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

\* 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.

8.5

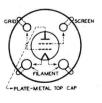
10



Power Output

TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS

16 approx.watts



BOTTOM VIEW OF BASE



# Co.

#### HALF-WAVE MERCURY-VAPOR RECTIFIER

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

#### MAX IMIM RATINGS

Peak Inverse Voltage: Condensed Mercury

Supply Freq.	Temp. Range	Col	umn I	Colum	nn II	
Up to 150∼	10° - 60°C	200	max.	7500	max.	volts
Peak Plate Curr	ent			1.0		amp.
Average Plate (	Current	0.50	max.	0.25	max.	amp.
Tube Voltage Dr	ор	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 o-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)



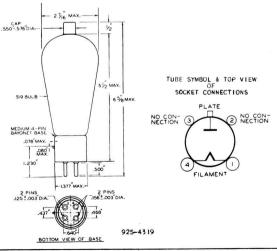
#### HALF-WAVE MERCURY-VAPOR RECTIFIER

(continued from preceding page)

For Circuits, refer to 928-4315 (page backing Type 872)

	A-C		CHO ONE-SEC	MAX. D-C	
CIRCUIT	INPUT VOLTS (RMS)	OUTPUT VOLTS TO FILTER	MIN. CHOKE (L) henrys	MAX. CONDENSER (C) µf	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
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	=	Ē	0.25 0.25 0.25 0.25

<sup>\*</sup> With condenser input to filter.





# de.

#### HALF-WAVE MERCURY-VAPOR RECTIFIER

Filament\* Coated
Voltage 2.5

5.0

a-c volts amp.

Maximum Overall Length
Maximum Diameter

6-5/8" 2-7/16**"** S-19

Bulb Cap

Current

Medium Metal

Base

Medium 4-Pin Bayonet

Peak Inverse Voltage

Supply Freq. Ambient Temp.

00

7500 max. volts

Up to 150 ∼ Peak Plate Current Tube Voltage Drop

O.6 max. amp.
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)



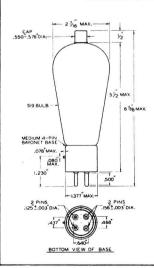
#### HALF-WAVE MERCURY-VAPOR RECTIFIER

For Circuits, refer to 928-4315 (page backing Type 872)

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

<sup>\*</sup> With condenser input to filter.



TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS







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

: MAXIMUM KAIINU	53
C - 1 - 1	mn I Column II
	max.   5000 max. volts
5° - 60°C -	10000 max. volts
2.0	max. 1.0 max. amp.
0.50	max. 0.25 max. amp.
10	10 approx.volts
	e: nsed Mercury mp. Range  6° - 70°C  200  200  200  200  0.50

\*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)

866,A



866. b

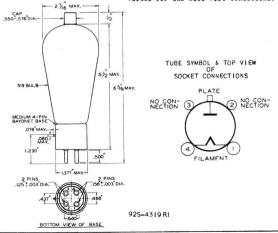
## HALF-WAVE MERCURY-VAPOR RECTIFIER

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

	( conclinaed		ovarne ,	-6	
		MAX.	CHOKE INPUT ONE-SECTION FILTER		MAX. D-C
	A-C	D-C	0112		
CIRCUIT	INPUT	OUTPUT	MIN.	MAX.	LOAD
	VOLTS**	VOLTS	CHOKE	CONDENSER	CURRENT
	(RMS)	TO	(L)	(C)	
		FILTER	henrys	μf	amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	3535 per tube 3000 " " 2000 " " 1500 " "	3180 2700 1800 1350	8.0 6.8 4.5 3.4	1.25 1.5 2.1 2.8	0.5 0.5 0.5
SINGLE-PHASE FULL-WAVE (4 tubes) FIG.2	7070 total 6000 " 5000 " 4000 "	6360 5400 4500 3600	16.0 13.5 11.0 8.9	0.6 0.7 0.9 1.1	0.5 0.5 0.5 0.5
THREE-PHASE HALF-WAVE FIG.3	4080 per leg 3000 " " 2000 " " 1500 " "	4780 3510 2340 1750	3.2 2.2 1.4 1.1	1.4 2.0 3.0 4.0	0.75 0.75 0.76 0.76
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	4080 per leg 3000 " " 2000 " " 1500 " "	4780 3510 2340 1750	2.0 1.5 1.0 0.7	0.5 0.7 1.1 1.5	1.5 1.5 1.5 1.5
THREE-PHASE FULL-WAVE FIG. 5	4080 per leg 3000 " " 2000 " " 1500 " "	9570 7020 4680 3510	1.8 1.4 0.9 0.7	0.5 0.7 1.2 1.5	0.75 0.75 0.75 0.75
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1*	3535 per tute 3000 " " 2000 " " 1500 " "	3950 3390 2260 1700	=	Ē	0.25 0.25 0.25 0.25

\* With condenser input to filter.

For use under the conditions of the 10000-volt peak inverse rating. If the 868-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.





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
Сар		No. 3905
Base#		No. 3502

#### MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq. Condensed Mercury Temp. Range

25° - 60°C Up to 150~

20000 max. volts 10 max. amp.

Peak Plate Current Tube Voltage Drop

Average Plate Current { Averaged over period of 30 sec.} 2.5 max. amp. 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 80 seconds.

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

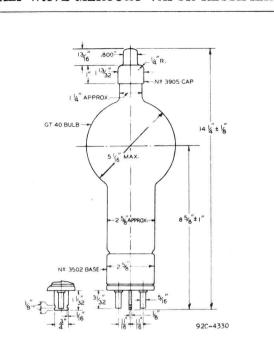
For shielding and r-f filter circuits, refer to Type 871.

The table below classifies suitable rectifier 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.

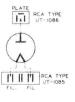
For Circuits, refer to 928-4315 (page backing Type 872)

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





## TUBE SYMBOL & CONNECTIONS TO END-MOUNTINGS





# 869.7

## 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
Сар		No. 3905
Base#		No. 3502

Peak Inverse Voltage:

Peak Plate Current

Supply Freq. Ambient Temp. Range

Up to 150 ~ 15° - 50°C 2

20000 max. volts
10 max. amp.

Average Plate Current { Averaged over period of 30 sec. Tube Voltage Drop

2.5 max. amp.
10 approx.volts

- \* The filament of the 869-A should be allowed to come up to operating temperature before plate voitage 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.

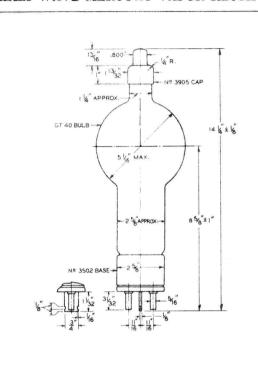
The table below classifies suitable rectifier circuits for the 869-A and shows their safe maximum input and maximum output operating conditions. The values are based on sine-wave input and the use of a suitable choke preceding any condenser in the filter circuit.

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

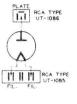
CIRCUIT	MAXIMUM A-C INPUT VOLTS (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG. 1	7000 per tube	6300	5.0
SINGLE-PHASE FULL-WAVE (4 tubes) FIG. 2	14000 total	12600	5.0
THREE-PHASE HALF-WAVE FIG. 3	8250 per leg	9600	7.5
THREE-PHASE DOUBLE-Y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







#### TUBE SYMBOL & CONNECTIONS TO END-MOUNTINGS





## 87

amp.

GT-80

No. 3914

## HALF-WAVE MERCURY-VAPOR RECTIFIER

(FORCED-AIR COOLED)

Coated Uni-potential Cathode\* Heater

a-c volts Voltage 65 Current

24-1/2" ± 1/2" Overall Length 10-1/4" Maximum Diameter

Bulb Bose#

Peak Inverse Voltage: Condensed Mercury Temp. Supply Freq. 30° - 50°C 7500 max. volts

Up to 150~

30° - 45°C 16000 max. volts Up to 150~ 450 max. amp. Peak Plate Current Averaged over Average Plate Current { period of 60 sec.} 75 max. amp.

10 approx.volts Tube Voltage Drop The cathode

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	565C 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	<b>76</b> 50	450
THREE-PHASE FULL-WAVE FIG.5	6540 per leg	15300	225

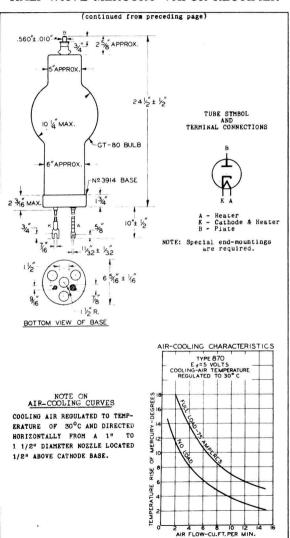
<sup>\*</sup> For maximum peak inverse voltage of 16000 volts.

(continued on next page)



810

## HALF-WAVE MERCURY-VAPOR RECTIFIER





## 18%

## HALF-WAVE MERCURY-VAPOR RECTIFIER

(FORCED-AIR COOLED)

Heater Coated Uni-potential Cathode\*

5

a-c volts

Current Overall Length

Voltage

65

cmb.

Overall Length Maximum Diameter 25" ± 1/2"

Bulb Base# 10-1/4" GT-80 No. 3914

volts

Peak Inverse Voltage:

Supply Freq. Condensed Mercury Teng. Range

Up to 150~

350 - 500

7500 max. 16000 max.

Up to 150~ 35° - 40 Peak Plate Current 450 max. volts

Average Plate Current { Averaged over period of 80 sec.}
Tube Voltage Drop

75 max. amp. 10 approx.volts

\* The cathode should be allowed to come up to operating temperature and the mercury vapor to reach operating pressure before plat 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 15000 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)

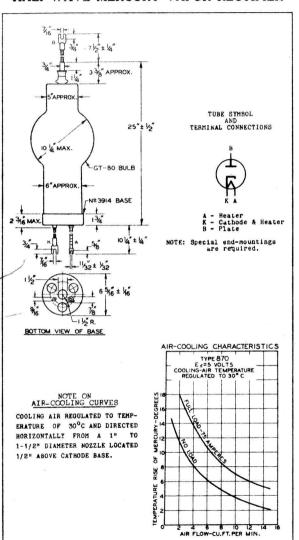
CIRÇUIT	MAXIMUM A-C INPUT VOLTS <sup>D</sup> (RMS)	APPROX. D-C OUTPUT VOLTS TO FILTER	MAXIMUM D-C LOAD CURRENT amperes
SINGLE-PHASE FULL-WAVE (2 tubes) FIG.1	565C per tube	5100	150
SINGLE-PHASE FULL-WAVE (4 tubes) FIG.2	11300 total	10200	150
THREE-PHASE HALF-WAVE FIG. 3	6540 per leg	7650	225
THREE-PHASE DOUBLE-Y PARALLEL FIG. 4	6540 per leg	<b>76</b> 50	450
THREE-PHASE FULL-WAVE FIG. 5	6540 per leg	15300	225

<sup>□</sup> For maximum peak inverse voltage of 16000 volts.



810

## HALF-WAVE MERCURY-VAPOR RECTIFIER



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

#### MAXIMUM RATINGS

Peak Inverse Voltage:

Supply Freq. Cond	ensed 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.

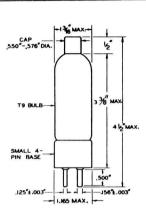
Shielding and r-f filter circuits should be provided for the 871 if it is subjected during operation to high-voltage, high-frequency fields. These fields tend to produce breakdown effects in mercury vapor and are detrimental to tube life and performance. External shielding is employed when the tube is 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 87l 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)

A-C INPUT VOLTS	D-C OUTPUT VOLTS	MAXIMUM D-C LOAD CURRENT amperes
1750 per tube	15 70	0.25
3500 total	3 150	0.25
2050 per leg	24 00	0.375
2050 per leg	24 00	0.75
2050 per leg	4800	0.375
	A-C INPUT VOLTS  (RMS)  1750 per tube  3500 total  2050 per leg  2050 per leg	A-C INPUT VOLTS D-C OUTPUT VOLTS  1750 per tube







BOTTOM VIEW OF BASE

925-4320R2

TUBE SYMBOL & TOP VIEW OF SOCKET CONNECTIONS

