



1619

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**TRANSMITTING BEAM POWER AMPLIFIER**

Filament	Coated	
Voltage	2.5	a-c or d-c volts
Current	2.0	amp.
Transconductance for plate current of 50 ma.	4500 approx.	μmhos
Direct Interelectrode Capacitances: <sup>⊙</sup>		
Grid to Plate	0.35	μμf
Input	10.5	μμf
Output	12.5	μμf
Maximum Overall Length		4-5/16"
Maximum Diameter		1-5/8"
Bulb		Metal Shell, MT-10
Base		Small Wafer Octal 7-Pin

**MAXIMUM RATINGS and TYPICAL OPERATING CONDITIONS**SINGLE-TUBE AMPLIFIER - Class A<sub>1</sub>

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
Screen Input	3.5 max.	watts
Plate Dissipation	15 max.	watts
Typical Operation (fixed bias):		
D-C Plate Voltage	300	volts
D-C Screen Voltage	250	volts
D-C Grid Voltage (Grid #1) <sup>## ⊙</sup>	-10	volts
Peak A-F Grid Voltage	10	volts
Beam-Forming Plate Voltage <sup>**</sup>	0	volts
Zero-Sig. D-C Plate Current	44	ma.
Max.-Sig. D-C Plate Current	46	ma.
Zero-Sig. D-C Screen Current	4	ma.
Max.-Sig. D-C Screen Current	6	ma.
Load Resistance	8800	ohms
T <sub>c</sub> 1 Harmonic Distortion	7	%
Max.-Sig. Power Output	3 approx.	watts

<sup>##</sup> The total effective grid-circuit resistance should not exceed 50000 ohms.

PUSH-PULL AMPLIFIER - Class AB<sub>1</sub>

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
Screen Input *	3.5 max.	watts
Plate Dissipation *	15 max.	watts
Typical Operation (fixed bias):		
<i>Unless otherwise specified, values are for 2 tubes</i>		
D-C Plate Voltage	400	volts
D-C Screen Voltage	300	volts
D-C Grid Voltage (Grid #1) <sup>† ⊙</sup>	-20	volts
Peak A-F Grid-to-Grid Voltage	40	volts
Beam-Forming Plate Voltage <sup>**</sup>	0	volts
Zero-Sig. D-C Plate Current	52	ma.
Max.-Sig. D-C Plate Current	80	ma.
Zero-Sig. D-C Screen Current	3.5	ma.

<sup>⊙</sup>, <sup>\*</sup>, <sup>\*\*</sup>, <sup>†</sup>: See end of tabulation.



## TRANSMITTING BEAM POWER AMPLIFIER

(continued from preceding page)

Max.-Sig. D-C Screen Current	10	ma.
Load Resistance (per tube)	3500	ohms
Effective Load Res. (plate to plate)	14000	ohms
Total Harmonic Distortion	3	%
Max.-Sig. Power Output	17.5	approx.watts

### PUSH-PULL AMPLIFIER - Class AB<sub>2</sub>

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
Max.-Sig. D-C Plate Current *	75 max.	ma.
Max.-Sig. Plate Input *	30 max.	watts
Screen Input *	3.5 max.	watts
Plate Dissipation *	15 max.	watts

Typical Operation (fixed bias):

*Unless otherwise specified, values are for 2 tubes*

D-C Plate Voltage	400	volts
D-C Screen Voltage	300	volts
D-C Grid Voltage (Grid #1) <sup>□</sup> <sup>○</sup>	-16.5	volts
Peak A-F Grid-to-Grid Voltage	77	volts
Beam-Forming Plate Voltage **	0	volts
Zero-Sig. D-C Plate Current	75	ma.
Max.-Sig. D-C Plate Current	150	ma.
Zero-Sig. D-C Screen Current	6.5	ma.
Max.-Sig. D-C Screen Current	11.5	ma.
Load Resistance (per tube)	1500	ohms
Effective Load Res. (plate to plate)	6000	ohms
Peak Grid Input Power <sup>∞</sup>	0.4	watt
Total Harmonic Distortion	2.5	%
Max.-Sig. Power Output <sup>◇</sup>	36	approx.watts

<sup>◇</sup> With zero-impedance driver and perfect regulation, plate-circuit distortion does not exceed 2%. In practice, plate-voltage regulation, screen voltage regulation and grid-bias regulation should not be greater than 5%, 5%, and 3%, respectively.

<sup>□</sup> The driver stage should be capable of supplying the grids of the class AB<sub>2</sub> stage with the specified peak grid voltage at low distortion. The effective resistance per grid circuit should not exceed 500 ohms and the effective impedance at the highest desired response frequency should not exceed 700 ohms.

### GRID-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	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
D-C Grid Voltage (Grid #1)	-125 max.	volts
D-C Plate Current	37.5 max.	ma.
Plate Input	15 max.	watts
Screen Input	2.5 max.	watts
Plate Dissipation	15 max.	watts

Typical Operation:

D-C Plate Voltage	400	volts
D-C Screen Voltage	250	volts
D-C Grid Voltage †	{ -50	volts
Peak R-F Grid Voltage	{ 1500	ohms
	58	volts

\*, \*\*, <sup>○</sup>, <sup>∞</sup>, †: See end of tabulation.



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**TRANSMITTING BEAM POWER AMPLIFIER**

(continued from preceding page)

Peak A-F Grid Voltage	30	volts
Beam-Forming Plate Voltage **	0	volts
D-C Plate Current	31	ma.
D-C Screen Current	1.5	ma.
D-C Grid Current	1.2 approx.	ma.
Driving Power <sup>∞</sup>	0.25 approx.	watt
Power Output	3.8 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	325 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
D-C Grid Voltage (Grid #1)	-125 max.	volts
D-C Plate Current	62 max.	ma.
D-C Grid Current	5 max.	ma.
Plate Input	20 max.	watts
Screen Input	2.5 max.	watts
Plate Dissipation	10 max.	watts

Typical Operation:

D-C Plate Voltage	325	volts
D-C Screen Voltage ♦	{ 285 5000	volts ohms
D-C Grid Voltage † □	{ -50 18000	volts ohms
Peak R-F Grid Voltage	70	volts
Beam-Forming Plate Voltage **	0	volts
D-C Plate Current	62	ma.
D-C Screen Current	7.5	ma.
D-C Grid Current	2.8 approx.	ma.
Driving Power	0.18 approx.	watt
Power Output	13 approx.	watts

♦ Obtained from modulated fixed supply or modulated plate-voltage supply through series resistor.

□ Obtained by grid-leak resistor or by partial self-bias methods.

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

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
D-C Grid Voltage (Grid #1)	-125 max.	volts
D-C Plate Current	75 max.	ma.
D-C Grid Current	5 max.	ma.
Plate Input	30 max.	watts
Screen Input	3.5 max.	watts
Plate Dissipation	15 max.	watts

Typical Operation:

D-C Plate Voltage	400	volts
D-C Screen Voltage §	{ 300 9500	volts ohms
D-C Grid Voltage † *	{ -55 11000	volts ohms
Peak R-F Grid Voltage	80	volts

\*\*, ∞, †, §, \*; See end of tabulation.

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# TRANSMITTING BEAM POWER AMPLIFIER

(continued from preceding page)

Beam-Forming Plate Voltage **	0	volts
D-C Plate Current	75	ma.
D-C Screen Current	10.5	ma.
D-C Grid Current	5 approx.	ma.
Driving Power	0.36 approx.	watt
Power Output	19.5 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.

○ For a-c filament supply, if d.c. is used, the stated voltages should be decreased by 1.75 volts.

† The total effective grid-circuit resistance should not exceed 25000 ohms.

\* Averaged over any audio-frequency cycle of sine-wave form. Beam-forming plates should be connected to the mid-point of filament operated on a.c., or to negative end of filament when d-c filament supply is used.

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

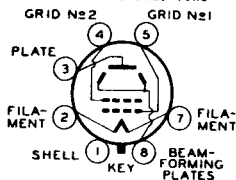
§ Obtained from fixed supply or plate-voltage supply through resistor.

\* Obtained by grid-leak resistor or other self- or fixed-bias method.

⊙ With shell connected to cathode.

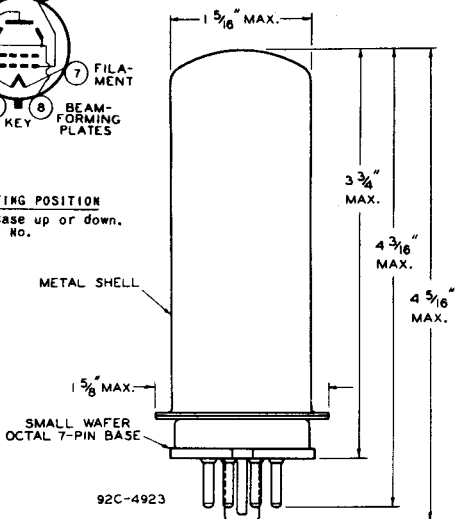
For use of the 1619 at the higher frequencies, refer to sheet  
TRANS. TUBE RATINGS vs FREQUENCY.

TUBE SYMBOL & BOTTOM VIEW  
OF SOCKET CONNECTIONS



TUBE MOUNTING POSITION

VERTICAL: Base up or down.  
HORIZONTAL: No.



92C-4923

SEPT. 1, 1938

RCA RADIOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

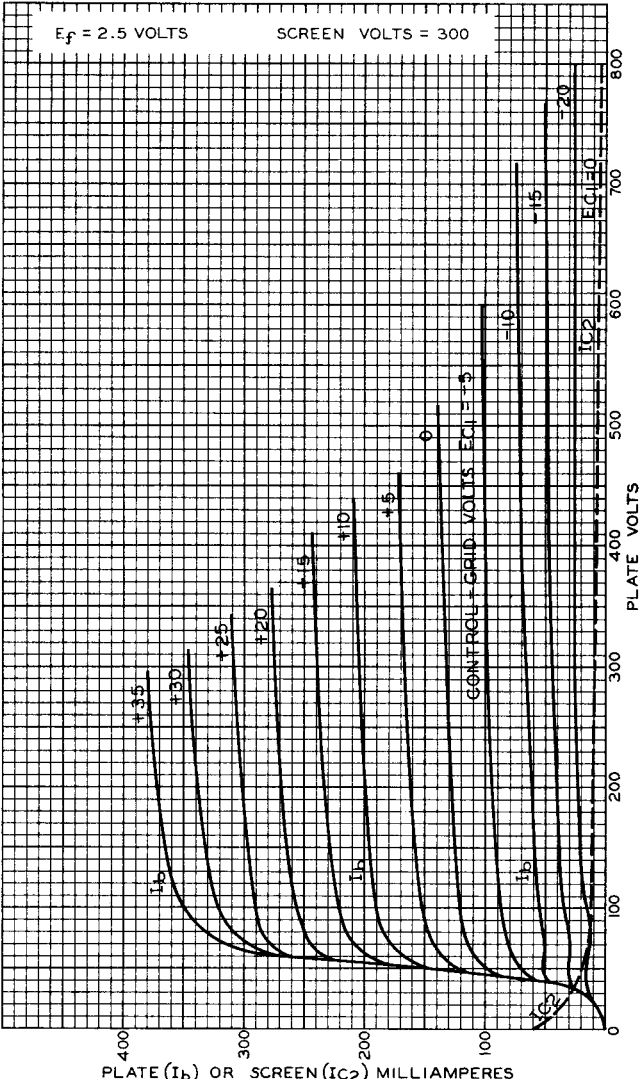
TENTATIVE DATA 2



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# AVERAGE PLATE CHARACTERISTICS



JUNE 15, 1938

RCA RADOTRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

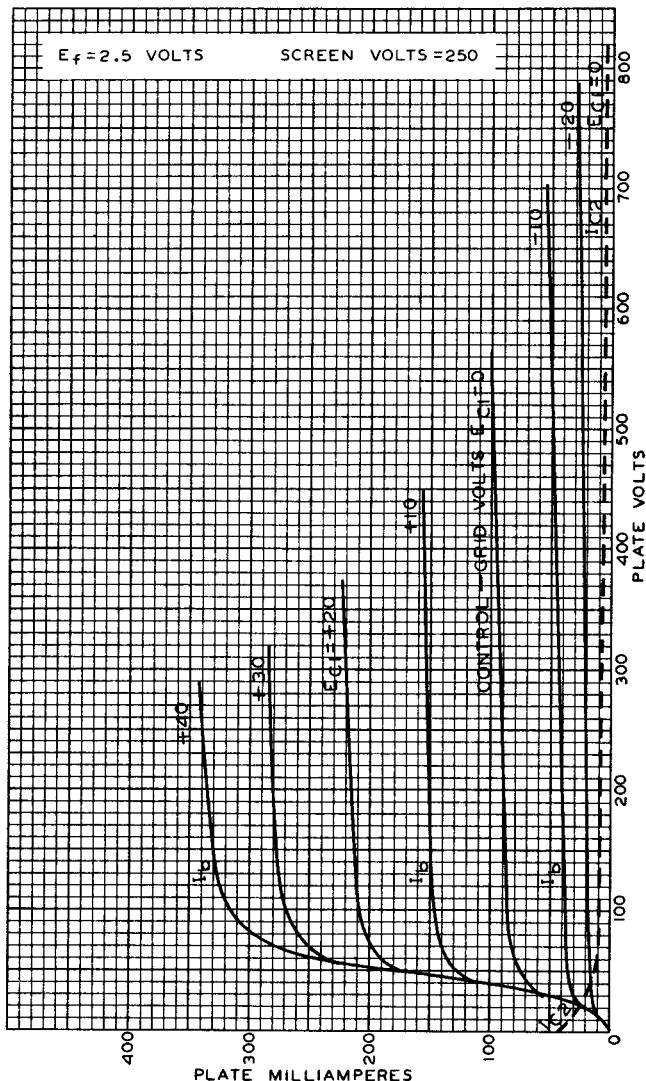
92C-4931

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## AVERAGE PLATE CHARACTERISTICS



JULY 27, 1938

PLATE MILLIAMPERES  
RCA RADIODRON DIVISION  
RCA MANUFACTURING COMPANY, INC.

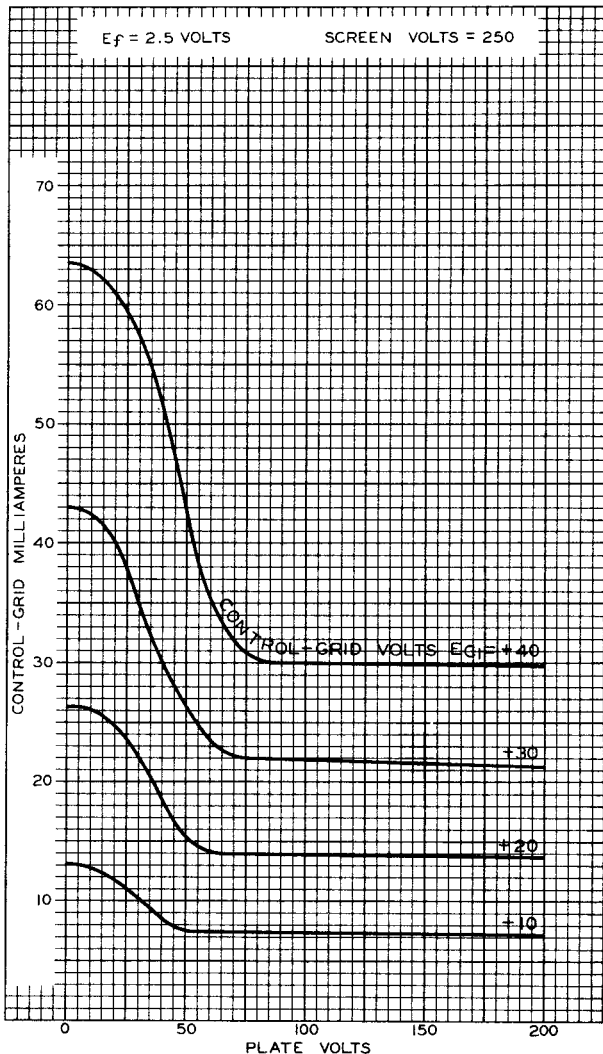
92C-4932



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### TYPICAL CHARACTERISTICS

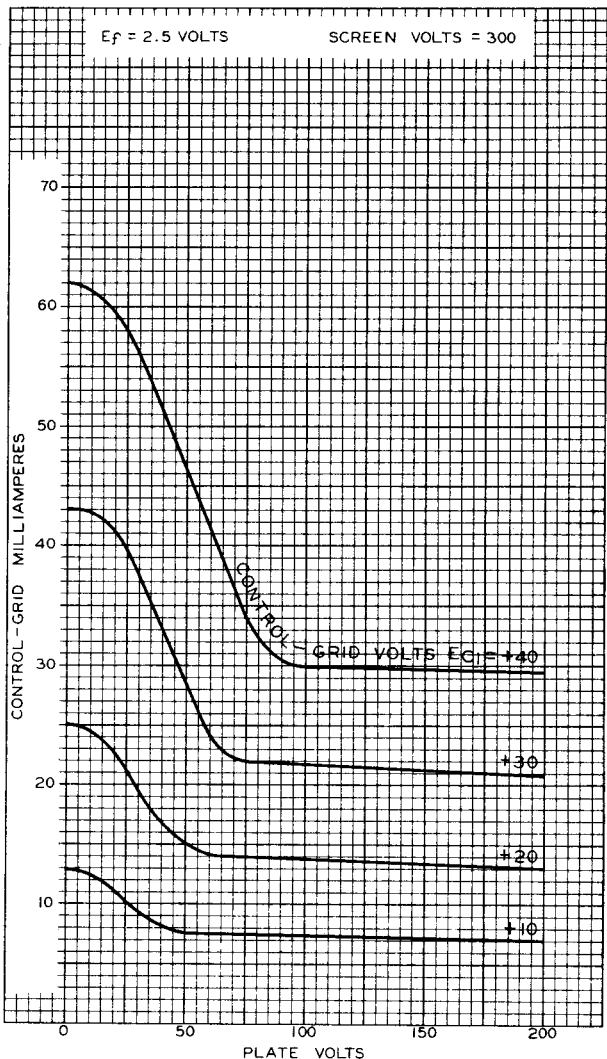


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### TYPICAL CHARACTERISTICS







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**TRANSMITTING BEAM POWER AMPLIFIER**

Filament	Coated	
Voltage	2.5	a-c or d-c volts
Current	2.0	amp.
Transconductance for plate current of 50 ma. 4500 approx.		μhos
Direct Interelectrode Capacitances: <sup>⊖</sup>		
Grid to Plate	0.29	μf
Input	9.6	μf
Output	12.5	μf
Maximum Overall Length		4-5/16"
Maximum Diameter		1-9/16" ± 1/16"
Bulb		Metal Shell, MT-10
Base		Small Wafer Octal 7-Pin

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

CCS = Continuous Commercial Service

SINGLE-TUBE AMPLIFIER - Class A<sub>1</sub>

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
Screen Input	3.5 max.	watts
Plate Dissipation	15 max.	watts
Typical Operation:		
D-C Plate Voltage	300	volts
D-C Suppressor Voltage (Grid #3)**	0	volts
D-C Screen Voltage	250	volts
D-C Grid Voltage (Grid #1) ## <sup>∘</sup>	-10	volts
Peak A-F Grid Voltage	10	volts
Zero-Sig. D-C Plate Current	44	ma.
Max.-Sig. D-C Plate Current	46	ma.
Zero-Sig. D-C Screen Current	4	ma.
Max.-Sig. D-C Screen Current	6	ma.
Load Resistance	8800	ohms
Total Harmonic Distortion	7	%
Max.-Sig. Power Output	3 approx.	watts

## The total effective grid-circuit resistance should not exceed 50000 ohms.

PUSH-PULL AMPLIFIER - Class AB<sub>1</sub>

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
Screen Input *	3.5 max.	watts
Plate Dissipation *	15 max.	watts

Typical Operation with Fixed Bias:

*Unless otherwise specified, values are for 2 tubes*

D-C Plate Voltage	400	volts
D-C Suppressor Voltage (Grid #3) **	0	volts
D-C Screen Voltage	300	volts
D-C Grid Voltage (Grid #1) † <sup>∘</sup>	-20	volts
Peak A-F Grid-to-Grid Voltage	40	volts
Zero-Sig. D-C Plate Current	52	ma.

∘, \*, \*\*, †, ⊖: See end of tabulation.

← Indicates a change.

AUG. 2, 1943

RCA VICTOR DIVISION

DATA

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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## TRANSMITTING BEAM POWER AMPLIFIER

(continued from preceding page)

Max.-Sig. D-C Plate Current	80	ma.
Zero-Sig. D-C Screen Current	3.5	ma.
Max.-Sig. D-C Screen Current	10	ma.
Load Resistance (per tube)	3500	ohms
Effective Load Res. (plate to plate)	14000	ohms
Total Harmonic Distortion	3	%
Max.-Sig. Power Output	17.5 approx.	watts

### PUSH-PULL AMPLIFIER - Class AB<sub>2</sub>

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
Max.-Sig. D-C Plate Current *	75 max.	ma.
Max.-Sig. Plate Input *	30 max.	watts
Screen Input *	3.5 max.	watts
Plate Dissipation *	15 max.	watts

Typical Operation with Fixed Bias:

*Unless otherwise specified, values are for 2 tubes*

D-C Plate Voltage	400	volts
D-C Suppressor (Grid #3) **	0	volts
D-C Screen Voltage	300	volts
D-C Grid Voltage (Grid #1) <sup>o</sup>	-16.5	volts
Peak A-F Grid-to-Grid Voltage <sup>o</sup>	77	volts
Zero-Sig. D-C Plate Current	75	ma.
Max.-Sig. D-C Plate Current	150	ma.
Zero-Sig. D-C Screen Current	6.5	ma.
Max.-Sig. D-C Screen Current	11.5	ma.
Load Resistance (per tube)	1500	ohms
Effective Load Res. (plate to plate)	6000	ohms
Peak Grid Input Power <sup>oo</sup>	0.4	watt
Total Harmonic Distortion	2.5	%
Max.-Sig. Power Output <sup>o</sup>	36 approx.	watts

◊ with zero-impedance driver and perfect regulation, plate-circuit distortion does not exceed 2%. In practice, plate-voltage regulation, screen voltage regulation and grid-bias regulation should not be greater than 5%, 5%, and 3% respectively.

◻ The driver stage should be capable of supplying the grids of the class AB<sub>2</sub> stage with the specified peak grid voltage at low distortion. The effective resistance per grid circuit should not exceed 500 ohms and the effective impedance at the highest desired response frequency should not exceed 700 ohms.

### GRID-MODULATED R-F POWER AMPLIFIER - Class C Telephony

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

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
D-C Grid Voltage (Grid #1)	-125 max.	volts
D-C Plate Current	37.5 max.	ma.
Plate Input	15 max.	watts
Screen Input	2.5 max.	watts
Plate Dissipation	15 max.	watts
Typical Operation:		
D-C Plate Voltage	400	volts

\*, \*\*, <sup>o</sup>, <sup>oo</sup>: See end of tabulation.



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**TRANSMITTING BEAM POWER AMPLIFIER**

(continued from preceding page)

D-C Suppressor (Grid #3) **	0	volts
D-C Screen Voltage	250	volts
D-C Grid Voltage † •	{ -50	volts
	{ 1500	ohms
Peak R-F Grid Voltage	58	volts
Peak A-F Grid Voltage	30	volts
D-C Plate Current	31	ma.
D-C Screen Current	1.5	ma.
D-C Grid Current	1.2	approx.ma.
Driving Power ∞	0.25	approx.watt
Power Output	3.8	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	325 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
D-C Grid Voltage (Grid #1)	-125 max.	volts
D-C Plate Current	62 max.	ma.
D-C Grid Current	5 max.	ma.
Plate Input	20 max.	watts
Screen Input	2.5 max.	watts
Plate Dissipation	10 max.	watts

**Typical Operation:**

D-C Plate Voltage	325	volts
D-C Suppressor (Grid #3) **	0	volts
D-C Screen Voltage ♦	{ 285	volts
	{ 5000	ohms
D-C Grid Voltage † □	{ -50	volts
	{ 18000	ohms
Peak R-F Grid Voltage	70	volts
D-C Plate Current	62	ma.
D-C Screen Current	7.5	ma.
D-C Grid Current	2.8	approx.ma.
Driving Power	0.18	approx.watt
Power Output	13	approx.watts

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

□ Obtained by grid resistor of value shown or by partial self-bias methods.

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

D-C Plate Voltage	400 max.	volts
D-C Screen Voltage (Grid #2)	300 max.	volts
D-C Grid Voltage (Grid #1)	-125 max.	volts
D-C Plate Current	75 max.	ma.
D-C Grid Current	5 max.	ma.
Plate Input	30 max.	watts
Screen Input	3.5 max.	watts
Plate Dissipation	15 max.	watts

\*\*, ∞, †, •: See end of tabulation.



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# TRANSMITTING BEAM POWER AMPLIFIER

(continued from preceding page)

## Typical Operation:

D-C Plate Voltage	400	volts
D-C Suppressor (Grid #3)**	0	volts
D-C Screen Voltage §	{ 300	volts
	{ 9500	ohms
D-C Grid Voltage † *	{ -55	volts
	{ 11000	ohms
Peak R-F Grid Voltage	80	volts
D-C Plate Current	75	ma.
D-C Screen Current	10.5	ma.
D-C Grid Current	.5 approx.	ma.
Driving Power	0.36 approx.	watt
Power Output	19.5 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.

○ For a-c filament supply. If d.c. is used, the stated voltages should be decreased by 1.75 volts.

† The total effective grid-circuit resistance should not exceed 25000 ohms.

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

\*\* Grid No. 3 should be connected to the mid-point of filament operated on a.c., or to negative end of filament when d-c filament supply is used.

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

⊙ Obtained from fixed supply or by cathode resistor of value shown.

⊙ Obtained from a separate source, or from the plate-voltage supply with a voltage divider, or through a series resistor of the value shown.

★ The screen voltage must not exceed 600 volts under key-up conditions. Obtained from fixed supply, by grid resistor (11000), or by combination methods. When a preceding stage is keyed, sufficient fixed bias must be used to maintain the plate current at a low value when the key is up.

⊙ With shell connected to cathode.

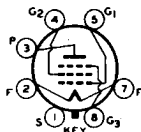
Data on operating frequencies for the 1619 are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY.

### TUBE MOUNTING POSITION

VERTICAL: Base up or down.

HORIZONTAL: No.

### BOTTOM VIEW OF SOCKET CONNECTIONS



- Pin 1 - Shell  
 Pin 2 - Filament  
 Pin 3 - Plate  
 Pin 4 - Grid No. 2  
 Pin 5 - Grid No. 1  
 Pin 7 - Filament  
 Pin 8 - Grid No. 3

← Indicates a change.