

Power Triode

GENERAL DATA

Electrical:

Filament, Thoriated Tungsten:

Voltage (AC or DC) 6.3 ± 0.3 volts

Current at filament volts = 6.3 4

Amplification Factor 29

Direct Interelectrode Capacitances:

Grid to plate 5.5 pf

Grid to filament 5.4 pf

Plate to filament 0.77 pf

Mechanical:

Operating Position Vertical, base down; or Horizontal,
pins 1 and 4 in vertical plane

Maximum Overall Length 6-15/32"

Seated Length 5-11/16" $\pm$ 5/32"

Maximum Diameter 2-7/16"

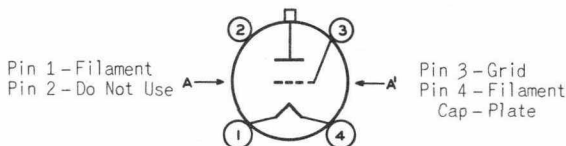
Weight 2.7 oz

Bulb ST19

Cap Medium (JEDEC No.C1-5)

Base Medium-Shell Small 4-Pin Micanol with Bayonet
(JEDEC No.A4-10)

Basing Designation for BOTTOM VIEW 3G



AF POWER AMPLIFIER & MODULATOR — Class B

Maximum Ratings, Absolute-Maximum Values:

	CCS*	ICAS**	
DC PLATE VOLTAGE	1250 max.	1500 max.	volts
MAX.—SIGNAL DC PLATE CURRENT*	175 max.	175 max.	ma
MAX.—SIGNAL PLATE INPUT*	165 max.	235 max.	watts
PLATE DISSIPATION*	45 max.	65 max.	watts

Typical Operation:

Values are for 2 tubes

DC Plate Voltage	1250	1500	volts
DC Grid Voltage#.	-40	-48	volts
Peak AF Grid-to-Grid Voltage.	225	270	volts
Zero-Signal DC Plate Current.	22	28	ma

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

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← Indicates a change.



	CCS*	ICAS**	
Max.-Signal DC Plate Current.	260	310	ma
Effective Load Resistance (plate-to-plate).	12200	13200	ohms
Max.-Signal Driving Power (Approx.)	3.5	5	watts
Max.-Signal Power Output (Approx.)	235	340	watts

PLATE-MODULATED RF POWER AMPLIFIER — Class C Telephony

*Carrier conditions per tube for use
with a maximum modulation factor of 1*

Maximum Ratings, Absolute-Maximum Values:

	CCS*	ICAS**	
DC PLATE VOLTAGE.	1000 max.	1250 max.	volts
DC GRID VOLTAGE.	-200 max.	-200 max.	volts
DC PLATE CURRENT.	125 max.	150 max.	ma
DC GRID CURRENT.	35 max.	35 max.	ma
PLATE INPUT.	115 max.	175 max.	watts
PLATE DISSIPATION.	30 max.	45 max.	watts

Typical Operation:

DC Plate Voltage.	1000	1250	volts
DC Grid Voltage*.	{ -110 3400	{ -115 3300	{ volts ohms
Peak RF Grid Voltage.	220	240	volts
DC Plate Current.	115	140	ma
DC Grid Current (Approx.)	33	35	ma
Driving Power (Approx.)	6.6	7.6	watts
Power Output (Approx.)	85	130	watts

RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy

Key-down conditions per tube without modulation□□

Maximum Ratings, Absolute-Maximum Values:

	CCS*	ICAS**	
DC PLATE VOLTAGE.	1250 max.	1500 max.	volts
DC GRID VOLTAGE.	-200 max.	-200 max.	volts
DC PLATE CURRENT.	175 max.	175 max.	ma
DC GRID CURRENT.	35 max.	35 max.	ma
PLATE INPUT.	175 max.	260 max.	watts
PLATE DISSIPATION.	45 max.	65 max.	watts

Typical Operation:

DC Plate Voltage.	1250	1500	volts
DC Grid Voltage▲▲.	{ -90 3000 530	{ -120 4000 590	{ volts ohms ohms
Peak RF Grid Voltage.	200	240	volts
DC Plate Current.	140	173	ma
DC Grid Current (Approx.)	30	30	ma
Driving Power (Approx.)	5.4	6.5	watts
Power Output (Approx.)	130	190	watts

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SELF-RECTIFYING OSCILLATOR or AMPLIFIER - Class C

Maximum Ratings, Absolute Values:

	CCS*	
AC PLATE VOLTAGE (RMS)	1750 max.	volts
DC GRID VOLTAGE.	-125 max.	volts
DC PLATE CURRENT	75 max.	ma
DC GRID CURRENT.	20 max.	ma
PLATE INPUT.	145 max.	watts
PLATE DISSIPATION.	45 max.	watts

Typical Operation in Push-Pull Circuit at 27 Mc.:

Values are for 2 tubes

AC Plate Voltage (RMS)	1740	volts
Grid Resistor*	3500	ohms
DC Plate Current	150	ma
DC Grid Current (at full load)	29	ma
Driving Power (Approx.)▲	12	watts
Power Output (Approx.)	200	watts
Useful Power Output (Approx.)- 75% circuit efficiency	150	watts

AMPLIFIER or OSCILLATOR - Class C

*With Separate, Rectified, Unfiltered, Single-Phase,
Full-Wave Plate Supply*

Maximum Ratings, Absolute Values:

	CCS*	
DC PLATE VOLTAGE	1125 max.	volts
DC GRID VOLTAGE.	-125 max.	volts
DC PLATE CURRENT	160 max.	ma
DC GRID CURRENT.	32 max.	ma
PLATE INPUT§	175 max.	watts
PLATE DISSIPATION.	45 max.	watts

Typical Operation:

DC Plate Voltage :	1125	volts
Grid Resistor*	2200	ohms
DC Plate Current	125	ma
DC Grid Current (Approx.)	30	ma
Driving Power (Approx.)§§	5	watts
Power Output (Approx.)	135	watts

• Continuous Commercial Service.

•• Intermittent Commercial and Amateur Service.

For ac filament supply.

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

▲▲ Obtained from a fixed supply, by grid resistor (3000, 4000) or by cathode resistor (530, 590).

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MARCH 1, 1951

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TENTATIVE DATA 2

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

▲ From a self-rectified driver.

● The 812-A can be biased by any convenient method, but the use of a grid resistor is preferred because the bias is automatically varied as the load on the circuit varies. In those applications where grid current and grid voltage may vary widely because of fluctuating loads, it is important to design equipment so that the maximum grid-current and grid-voltage ratings are never exceeded for any load. An approximate rule is to adjust the grid-current and grid-voltage values at full-load to one-half of the corresponding maximum values. This operating condition permits grid-current and grid-voltage values to rise from zero load to twice their full-load values, and usually provides adequate leeway.

§ Power input to plate is 1.23 times the product of DC Plate Voltage and DC Plate Current.

§§ From a driver with a rectified, unfiltered, single-phase, full-wave plate supply.

NOTE: When the 812-A is used in the final amplifier or a preceding stage of a transmitter designed for break-in operation and oscillator keying, a small amount of fixed bias must be used to maintain the plate current at a safe value. With a plate voltage of 1500 volts, a fixed bias of at least -45 volts should be used.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	<u>Note</u>	<u>Min.</u>	<u>Max.</u>	
Filament Current	1	3.75	4.25	amp
Amplification Factor	1,2	26	32	
Grid-Plate Capacitance	-	4.8	6.2	μ f
Grid-Filament Capacitance	-	4.4	6.4	μ f
Plate-Filament Capacitance	-	0.58	0.96	μ f
Grid Current	1,3	17	39	ma
Plate Current	1,4	18	42	ma
Useful Power Output	1,5	140	-	watts

Note 1: DC filament voltage = 6.3 volts.

Note 2: With dc grid voltage of -30 volts and plate voltage adjusted to give plate current of 30 ma.

Note 3: With dc plate voltage of 200 volts and dc grid voltage of +50 volts.

Note 4: With dc plate voltage of 1250 volts and dc grid voltage of -30 volts.

Note 5: With dc plate voltage of 1500 volts, plate current of 175 ma., grid current of 34 to 50 ma., grid resistor of $3500 \pm 10\%$ ohms and frequency of 15 Mc.

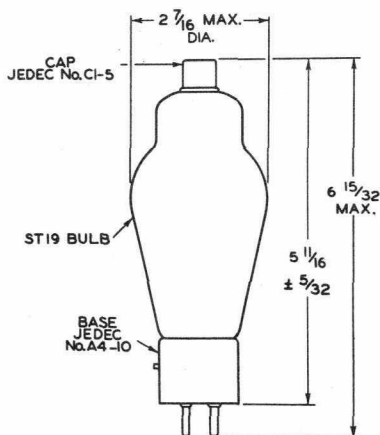
Data on operating frequencies for the 812-A are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY

OPERATING CONSIDERATIONS

Plate shows no color when tube is operated at maximum CCS ratings, and shows a barely perceptible red color at maximum ICAS ratings.

MAXIMUM RATINGS vs OPERATING FREQUENCY

OPERATING FREQUENCY Mc	MAXIMUM PERMISSIBLE PERCENTAGE OF MAXIMUM PLATE VOLTAGE & PLATE INPUT	
	TELEPHONY	TELEGRAPHY
	Class C Plate- Modulated	Class C
30	100	100
60	89	89
80	70	70
100	55	55



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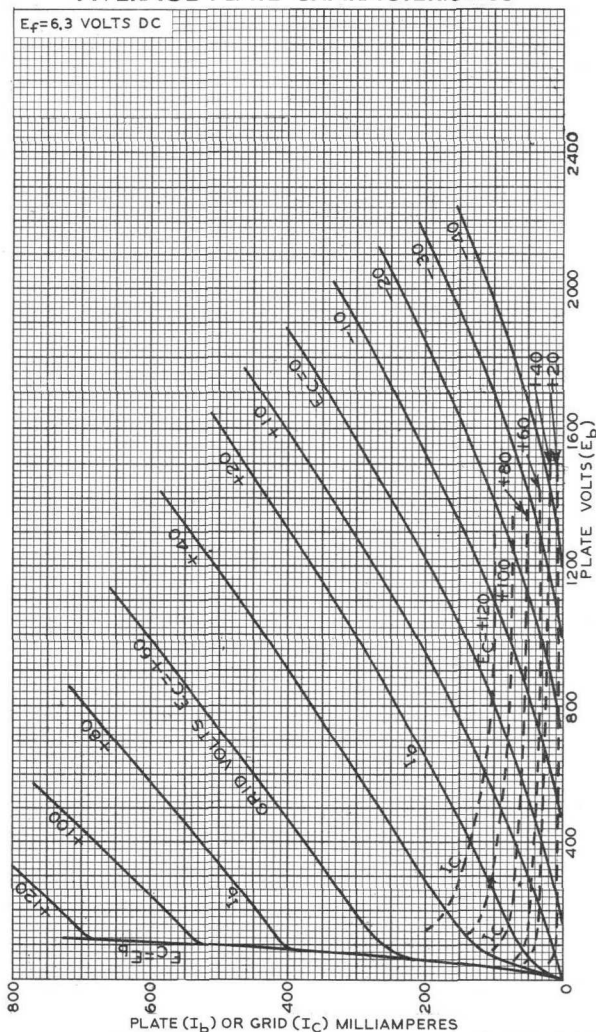
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AVERAGE PLATE CHARACTERISTICS

$E_f = 6.3$ VOLTS DC



92CM-6074RI





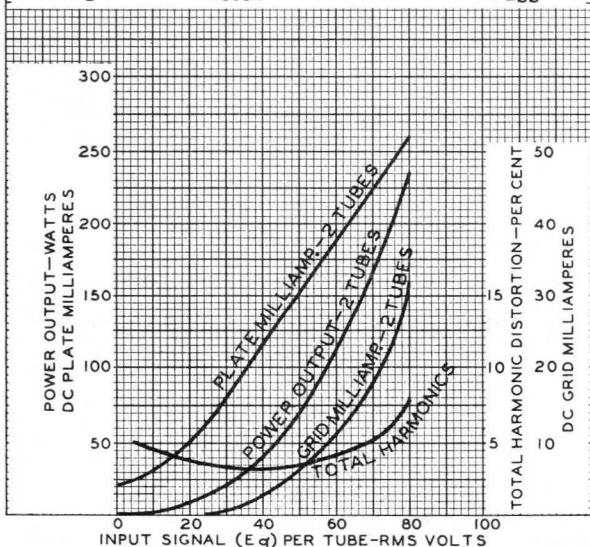
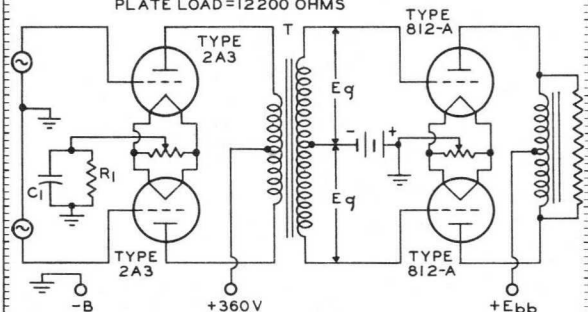
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812-A

OPERATION CHARACTERISTICS

 $E_f = 6.3$ VOLTS AC FOR 812-A's & 2.5 VOLTS AC FOR 2A3'sINPUT: CLASS AB₁—TWO TYPE 2A3's; PLATE-SUPPLY VOLTS=360; CATHODE-BIAS RESISTOR (R_1) = 780 OHMS; BYPASS CAPACITOR (C_1) = 80 μ F

INTERSTAGE TRANSFORMER (T):

VOLTAGE RATIO $\frac{\text{PRIMARY}}{\text{1/2 SEC.}} = 1.4$ OUTPUT: CLASS B—TWO TYPE 812-A's; PLATE VOLTS (E_{bb}) = 1250; DC GRID VOLTS = -40; PLATE-TO-PLATE LOAD = 12200 OHMS

FEB. 27, 1948

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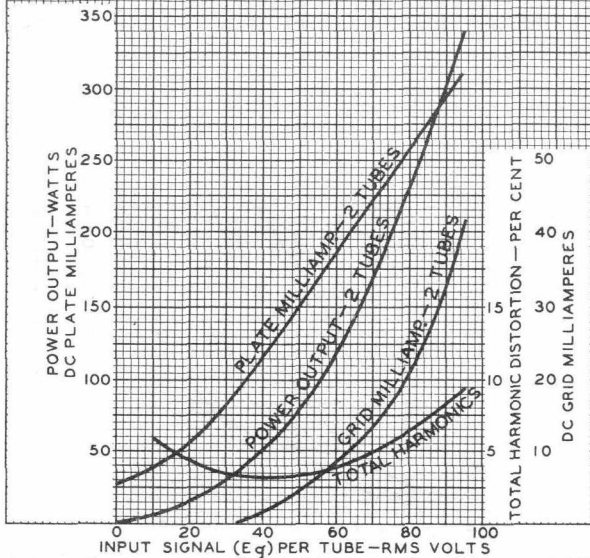
OPERATION CHARACTERISTICS

* $E_f = 6.3$ VOLTS AC FOR 812-A's & 2.5 VOLTS AC FOR 2A3's
CIRCUIT ARRANGEMENT: SAME AS ON DWG. 92CM-6938
UNDER TYPE 812-A

INPUT: CLASS AB₁—TWO TYPE 2A3's; PLATE-SUPPLY
VOLTS=360; CATHODE-BIAS RESISTOR (R_1)=780
OHMS; BYPASS CAPACITOR (C_1)=80 μ F

INTERSTAGE TRANSFORMER (T):
VOLTAGE RATIO $\frac{\text{PRIMARY}}{\frac{1}{2} \text{ SEC.}} = 1.4$

OUTPUT: CLASS B—TWO TYPE 812-A's; PLATE VOLTS
(E_{bb})=1500; DC GRID VOLTS=-48; PLATE-TO-
PLATE LOAD=13200 OHMS



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