9C21

POWER TRIODE

WATER- & FORCED-AIR-COOLED

GENERAL DATA

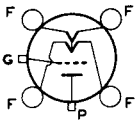
Electrical:

Filament, Multistrand Tungsten:

Excitation . . .	Single Phase AC or DC	
Voltage.	19.5	ac or dc volts
Current.	415	amp
Starting Current:	The filament current must never exceed 750 amperes, even momentarily.	
Cold Resistance. . . .	0.0042	ohm ←
Amplification Factor . .	36	←
Direct Interelectrode Capacitances (Approx.):		←
Grid to Plate.	46	μμf
Grid to Filament . . .	100	μμf
Plate to Filament. . .	2.0	μμf

Mechanical:

Terminal Connections:



F - Filament
G - Grid-Flange Terminal

P - Water-Cooled Plate Terminal

DIAMETRICALLY OPPOSITE TERMINALS MUST BE CONNECTED TOGETHER

Mounting Position.	Vertical, Filament End Up	
Maximum Overall Length	24-1/2"	
Maximum Diameter	9-1/2"	
Water Jacket	RCA MI - 19460	←
Gasket	RCA MI - 27001	←
Water Flow	15 to 20 gpm	

The water flow must start before the application of any voltages and must continue for at least 2 minutes after the removal of all voltages.

Air Flow:

To Filament Seals.	10 min.	cfm

The specified air flow directed by a nozzle of 1-1/4" diameter into the filament header is required before and during the application of any voltages to limit the temperature of the filament seals to the maximum value. ←

To Plate Seal and Bulb	250	cfm

The specified air flow at a pressure of 1.3 inches of water must be directed at and distributed uniformly around the plate seal and bulb to limit the temperature of each to its maximum value at the hottest point. ←

Outlet Water Temperature	70 max.	°C
Bulb Temperature	180 max.	°C
Seal Temperature (Filament, grid, plate) . . .	165 max.	°C ←

AF POWER AMPLIFIER & MODULATOR - Class B

Maximum CCS* Ratings, *Absolute Values*:

DC PLATE VOLTAGE	15000 max.	volts
MAX.-SIGNAL DC PLATE CURRENT*	6 max.	amp
MAX.-SIGNAL PLATE INPUT*	90 max.	kw
PLATE DISSIPATION*	40 max.	kw

* * See next page.

← Indicates a change.

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Typical Operation:

Unless otherwise specified, values are for 2 tubes

DC Plate Voltage	10200	14000	volts
DC Grid Voltage	−220	−300	volts
Peak AF Grid-to-Grid Voltage	850	1050	volts
Zero-Signal DC Plate Current	0.6	0.6	amp
Max.-Signal DC Plate Current	5.7	7.1	amp
Effective Load Resistance (plate-to-plate)	3600	4000	ohms
Max.-Signal Driving Power (Approx.)#	110	150	watts
Max.-Signal Power Output (Approx.)	36	61	kw

PLATE-MODULATED RF POWER AMPLIFIER – Class C Telephony

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

Maximum CCS● Ratings, *Absolute Values*:

DC PLATE VOLTAGE	12500 max.		volts
DC GRID VOLTAGE	−2000 max.		volts
DC PLATE CURRENT	4 max.		amp
→ DC GRID CURRENT	1.5 max.		amp
PLATE INPUT	50 max.		kw
PLATE DISSIPATION	28 max.		kw

Typical Operation:

DC Plate Voltage	10200	12500	volts
DC Grid Voltage⊕	−1500	−1670	volts
	2000	2100	ohms
Peak RF Grid Voltage	1960	2190	volts
DC Plate Current	3.1	3.5	amp
DC Grid Current (Approx.)□	0.75	0.79	amp
Driving Power (Approx.)□	1320	1570	watts
Power Output (Approx.)	27.5	38	kw

RF POWER AMPLIFIER & OSCILLATOR – Class C Telegraphy

Key-down conditions per tube without modulation□□

Maximum CCS● Ratings, *Absolute Values*:

DC PLATE VOLTAGE	17000 max.		volts
DC GRID VOLTAGE	−2000 max.		volts
DC PLATE CURRENT	9 max.		amp
→ DC GRID CURRENT	1.5 max.		amp
PLATE INPUT	150 max.		kw
PLATE DISSIPATION	40 max.		kw

Typical Operation:

DC Plate Voltage	14000	17000	volts
DC Grid Voltage▲▲	−1500	−1600	volts
	230	180	ohms
	1800	1780	ohms

●, *, #, ⊕, □, □□, ▲▲: See next page. →Indicates a change.

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Peak RF Grid Voltage	2000	2200	volts
DC Plate Current	5.8	7.9	amp
DC Grid Current (Approx.).	0.83	0.9	amp
Driving Power (Approx.).	1500	1800	watts
Power Output (Approx.)	61	100	kw

● Continuous Commercial Service.

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

The driving stage should have good regulation and should be capable of supplying considerably more than the specified driving power.

⊕ Obtained by grid resistor (2000, 2100) or by partial self-bias methods.

□ Subject to wide variations as explained under TUBE RATINGS in General Section.

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

▲▲ Obtained from cathode resistor (230, 180), or grid resistor (1800, 1780) or by partial self-bias methods.

Data on operating frequencies for the 9C21 are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY.

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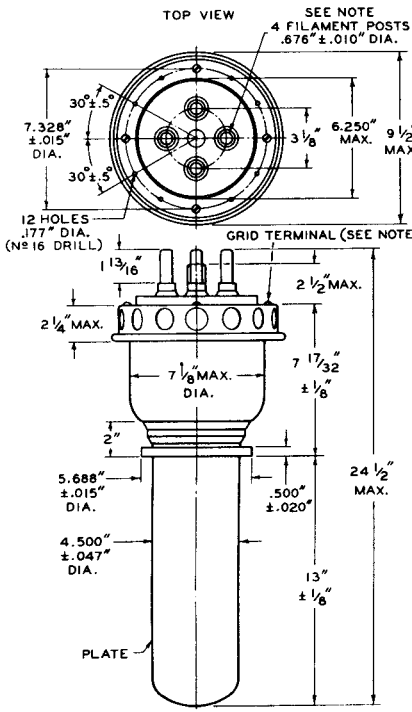
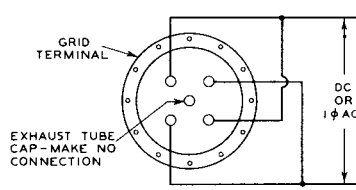


NOTE: FLEXIBLE CONNECTIONS ARE REQUIRED.

92CM-6438R1

FILAMENT CONNECTIONS



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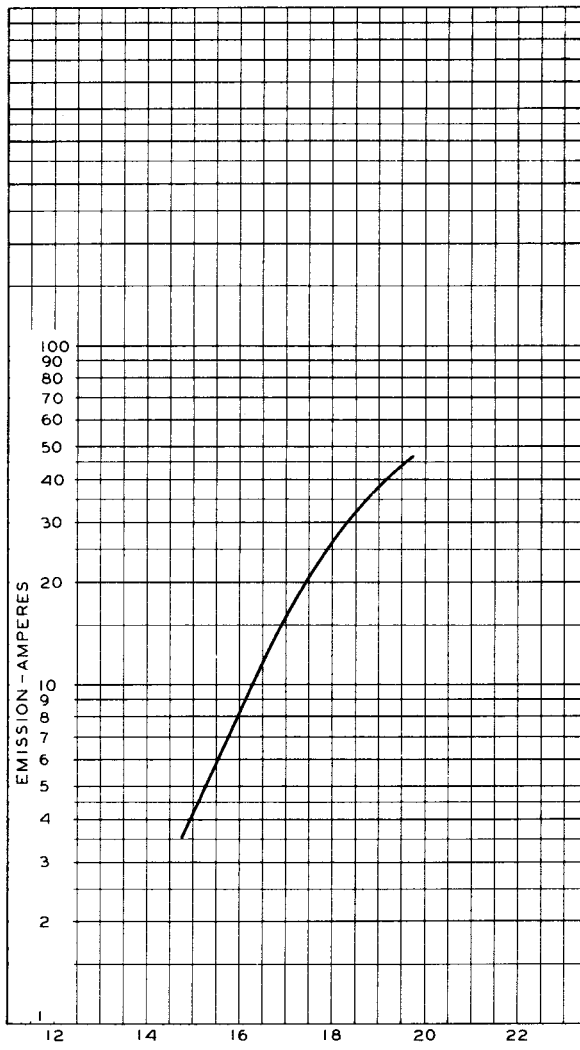
AVERAGE FILAMENT-EMISSION CHARACTERISTIC



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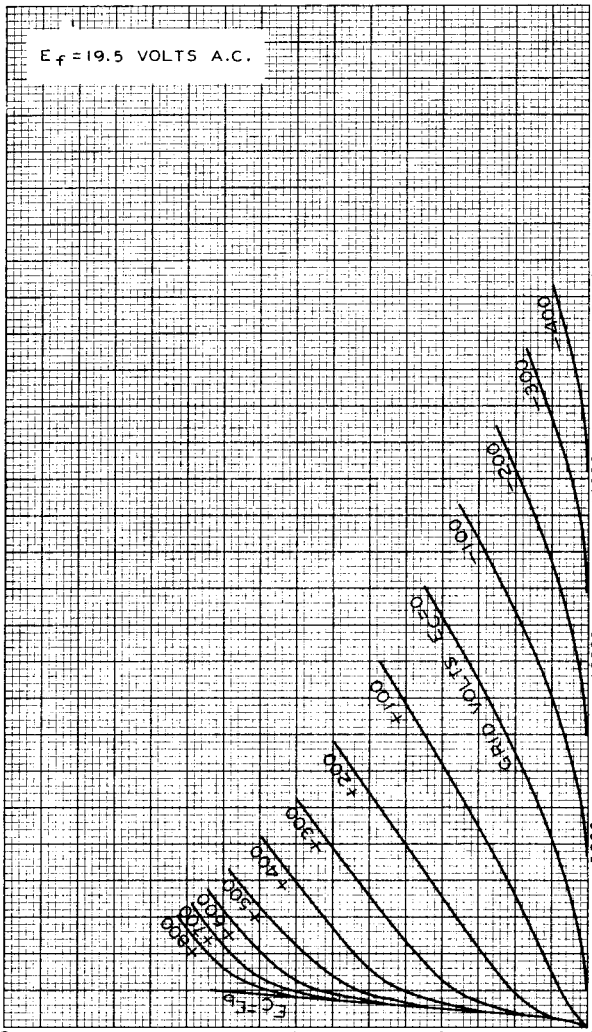
AVERAGE PLATE CHARACTERISTICS



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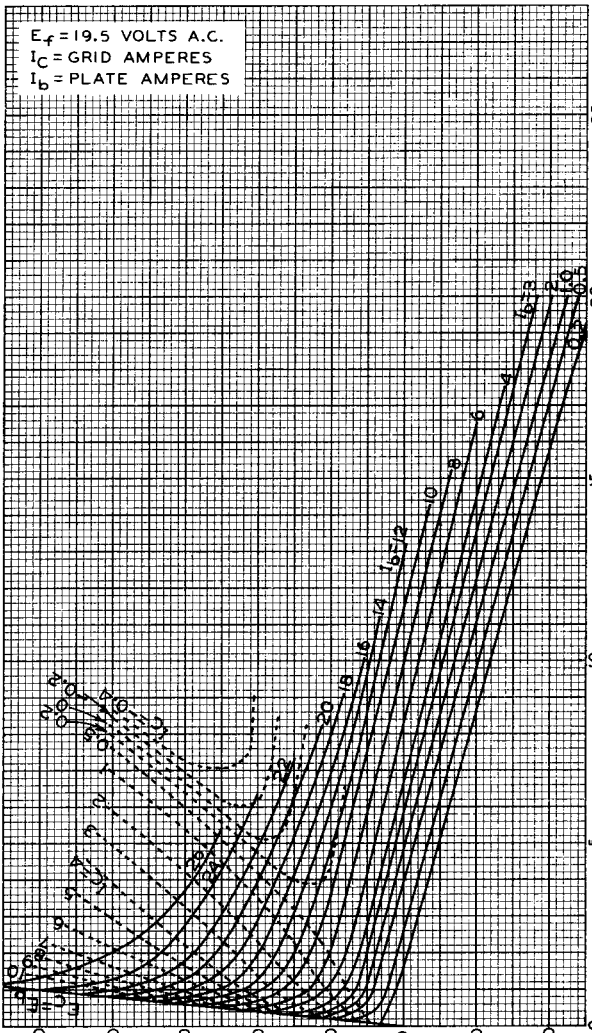
AVERAGE CONSTANT-CURRENT CHARACTERISTICS



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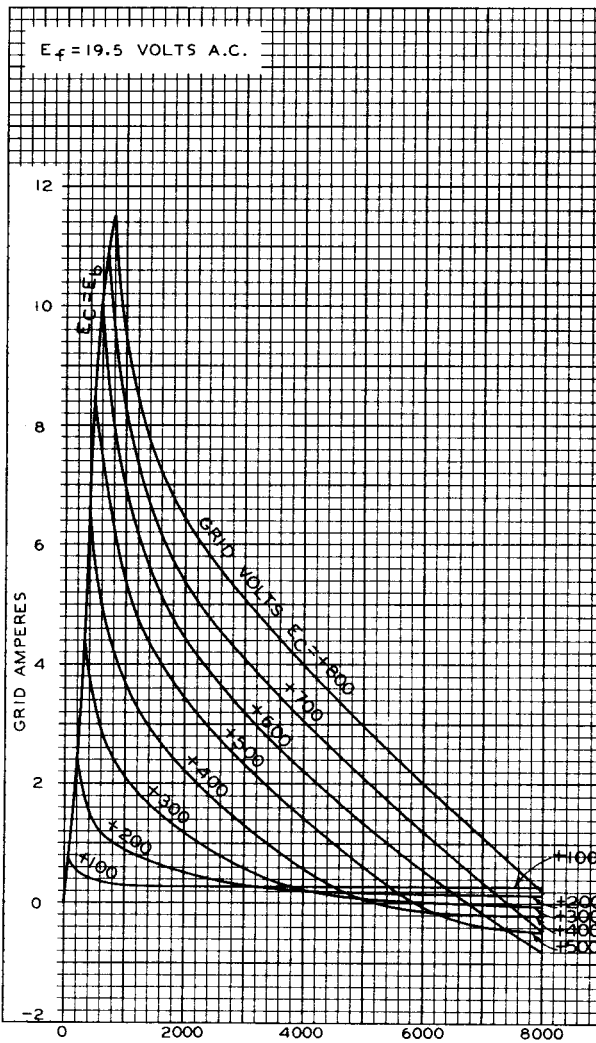
TYPICAL CHARACTERISTICS



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92CM-6463

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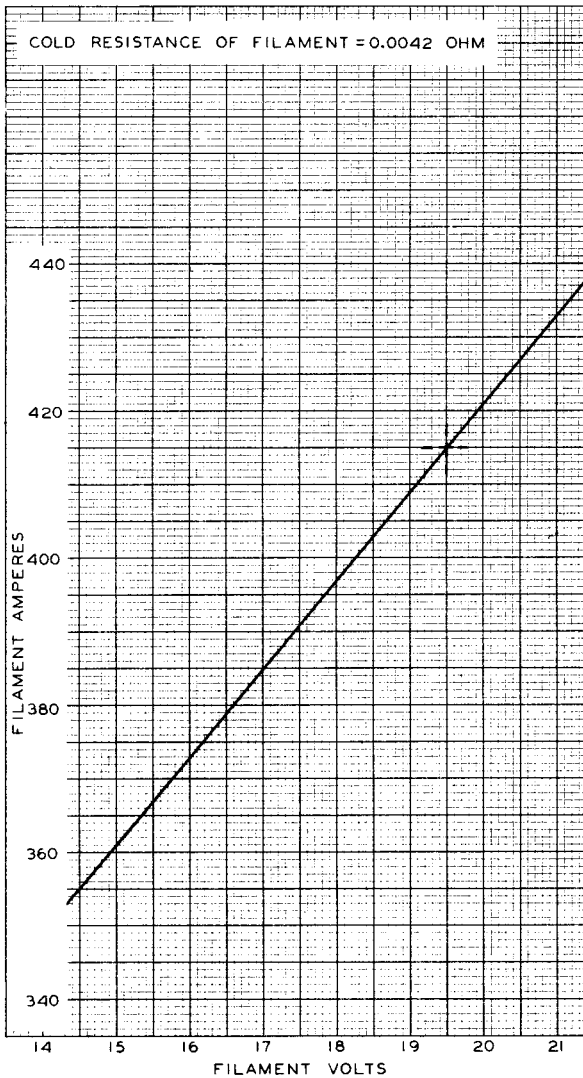
AVERAGE FILAMENT CHARACTERISTIC



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TUBE DEPARTMENT
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92CM-6457