



9C21

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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.

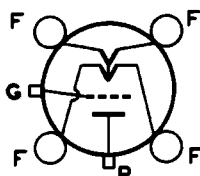
Cold Resistance. 0.0042 ohm

Amplification Factor . . . 36

Direct Interelectrode Capacitances (Approx.):

Grid to Plate. 46 μf Grid to Filament 100 μf Plate to Filament. 2.0 μf **Mechanical:**

Terminal Connections:

F - Filament
G - Grid-Flange
TerminalP - Water-Cooled
Plate
TerminalDIAMETRICALLY 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 2000	-1670	volts
		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 230 1800	-1600	volts
		180	ohms
		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.

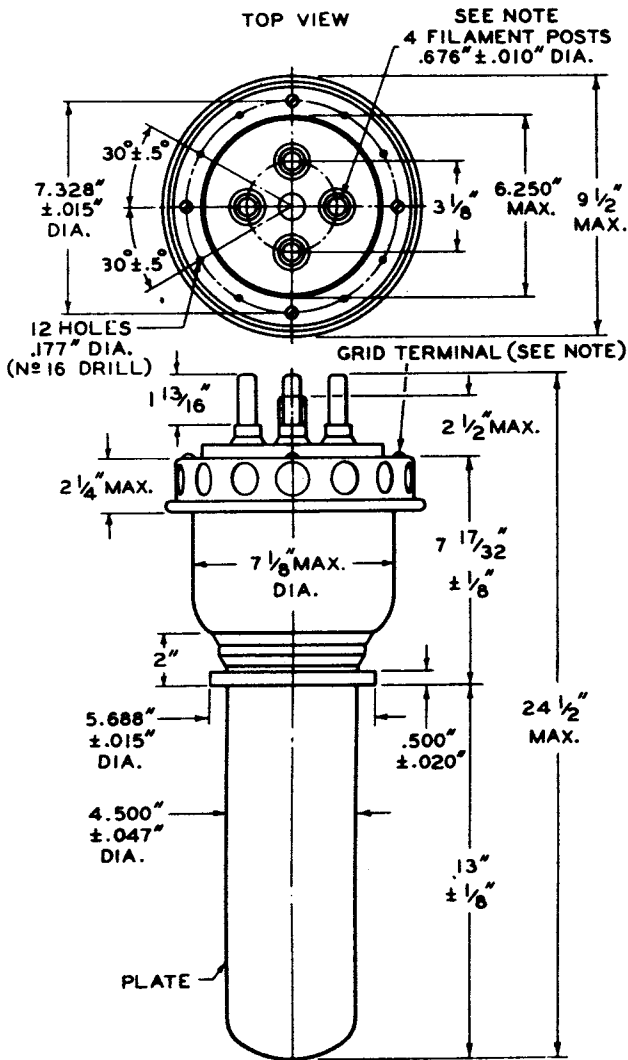
Data on operating frequencies for the 9C21 are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY.

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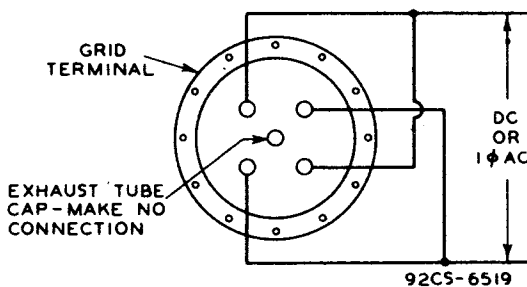
POWER TRIODE



NOTE: FLEXIBLE CONNECTIONS ARE REQUIRED.

92CM-6438R1

FILAMENT CONNECTIONS



92CS-6519

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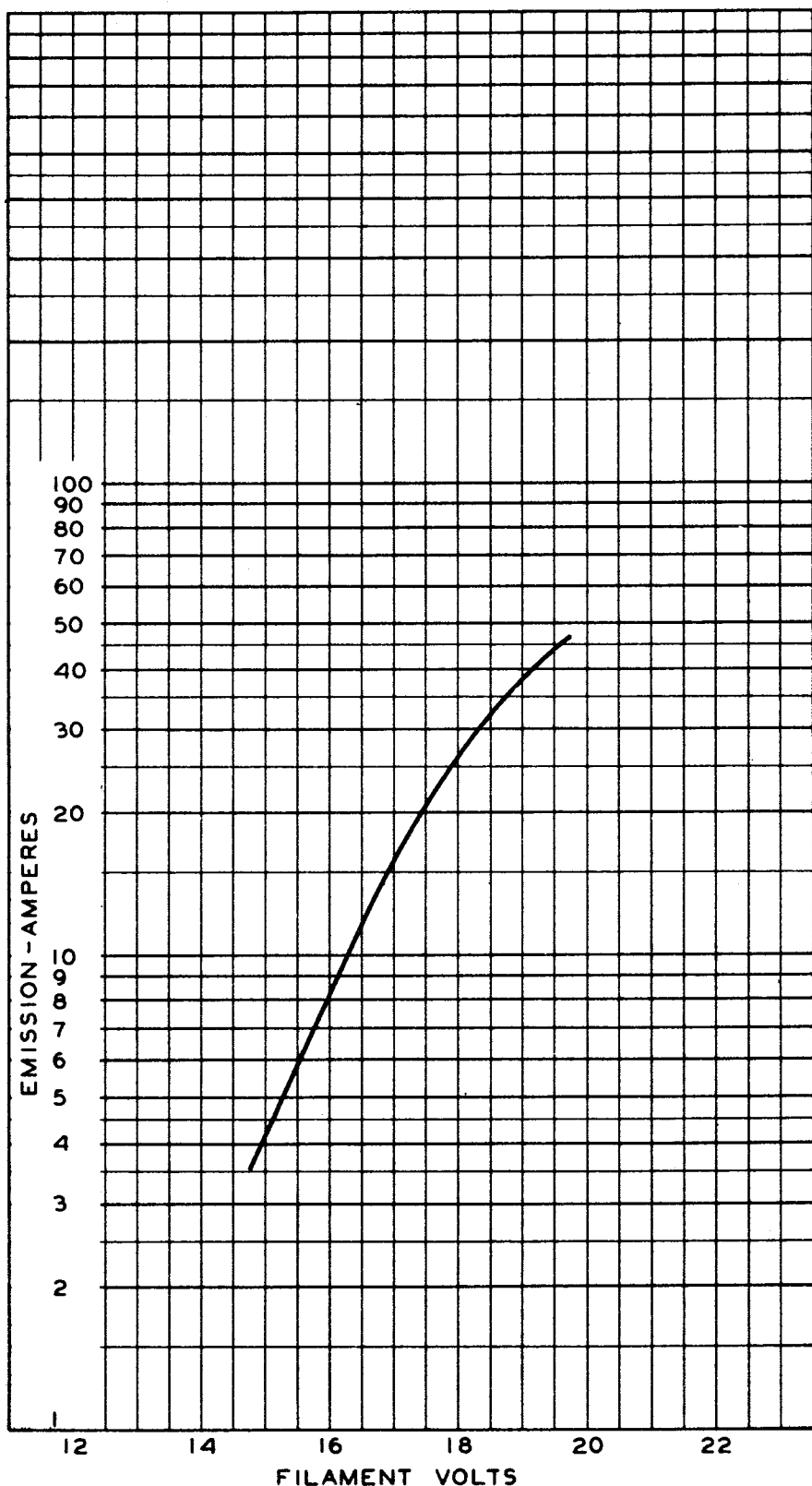
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AVERAGE FILAMENT-EMISSION CHARACTERISTIC



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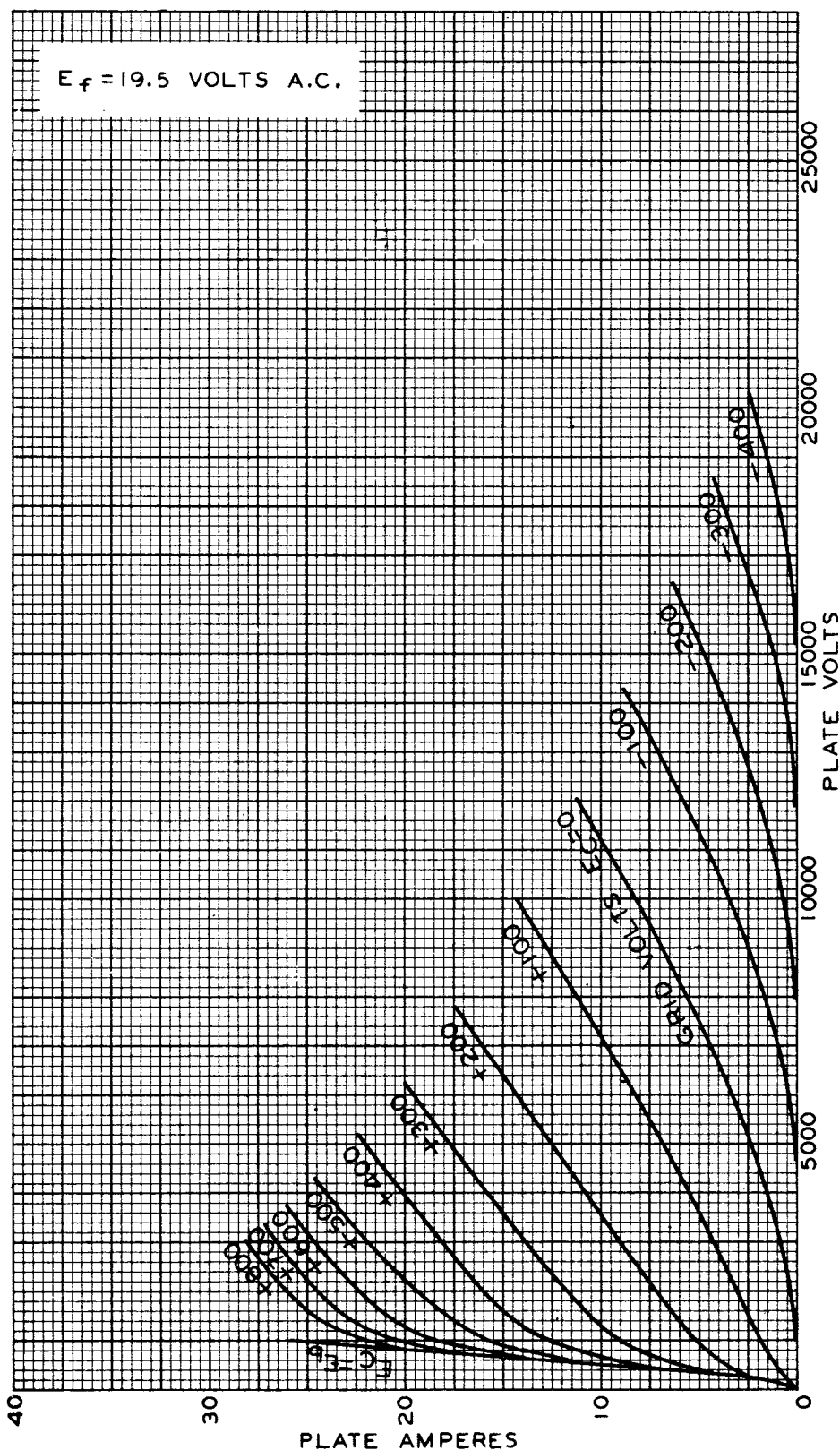
92CM-6458

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AVERAGE PLATE CHARACTERISTICS

 $E_f = 19.5 \text{ VOLTS A.C.}$


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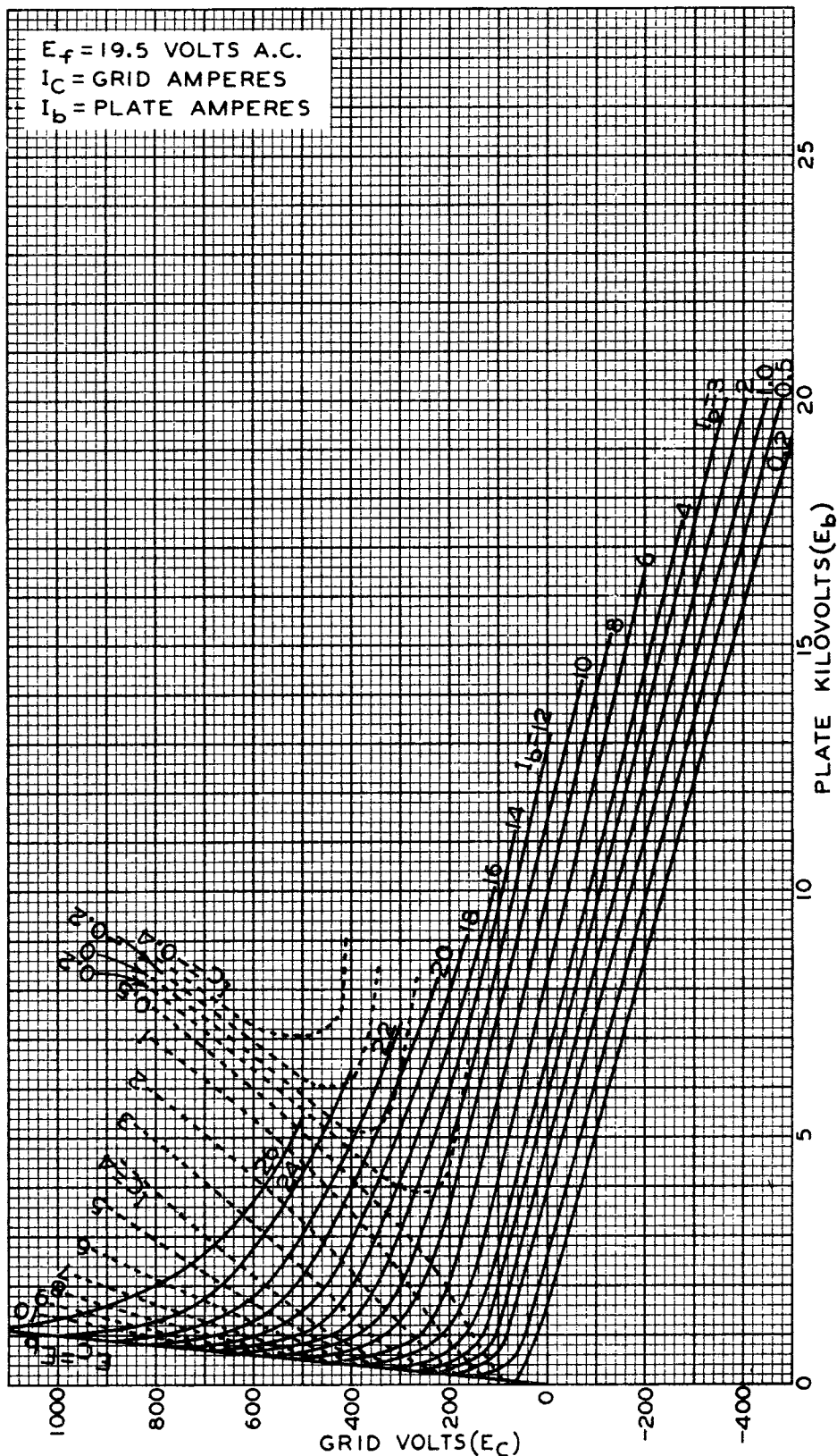
92CM-6461



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AVERAGE CONSTANT-CURRENT CHARACTERISTICS



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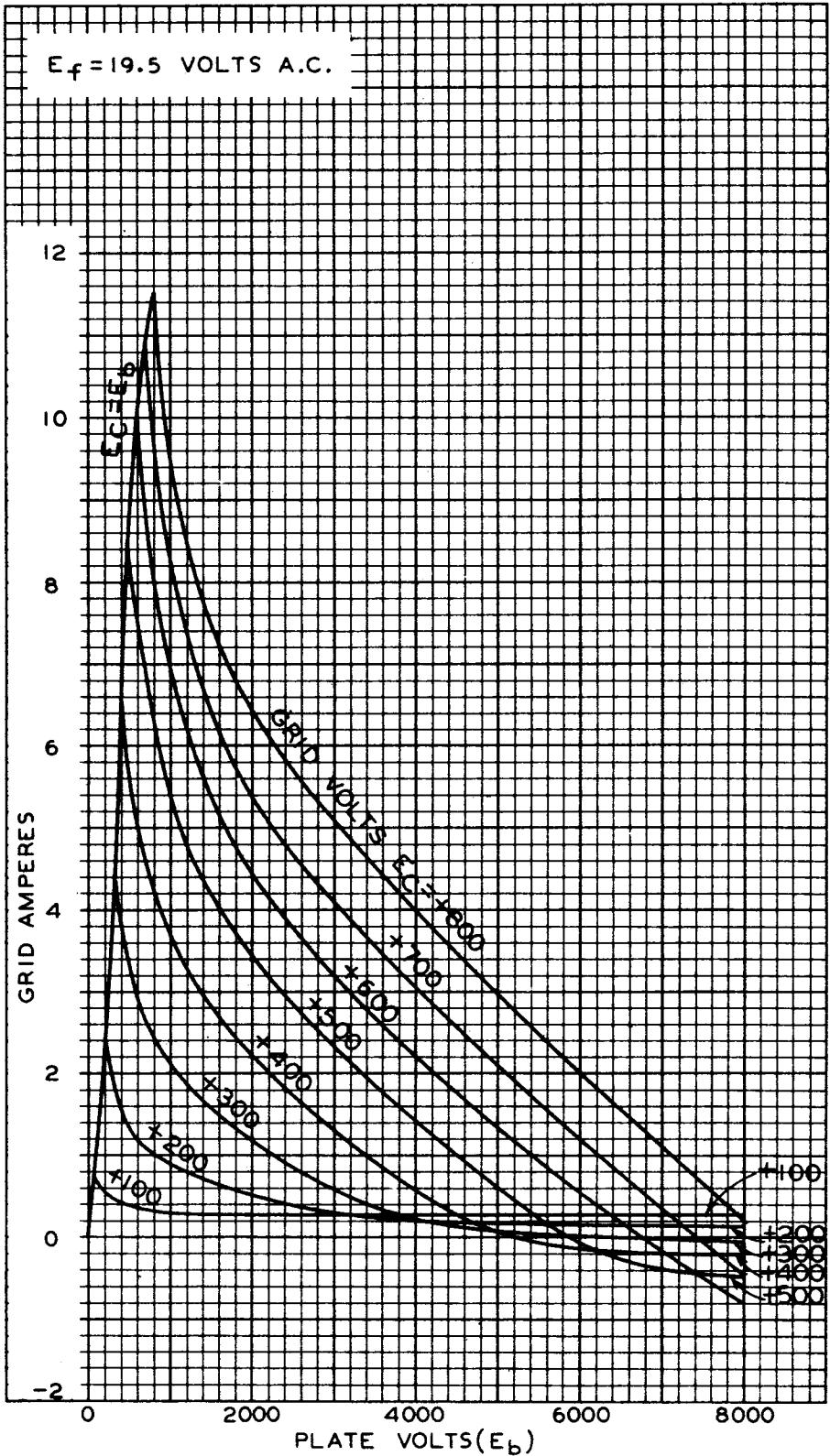
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TYPICAL CHARACTERISTICS



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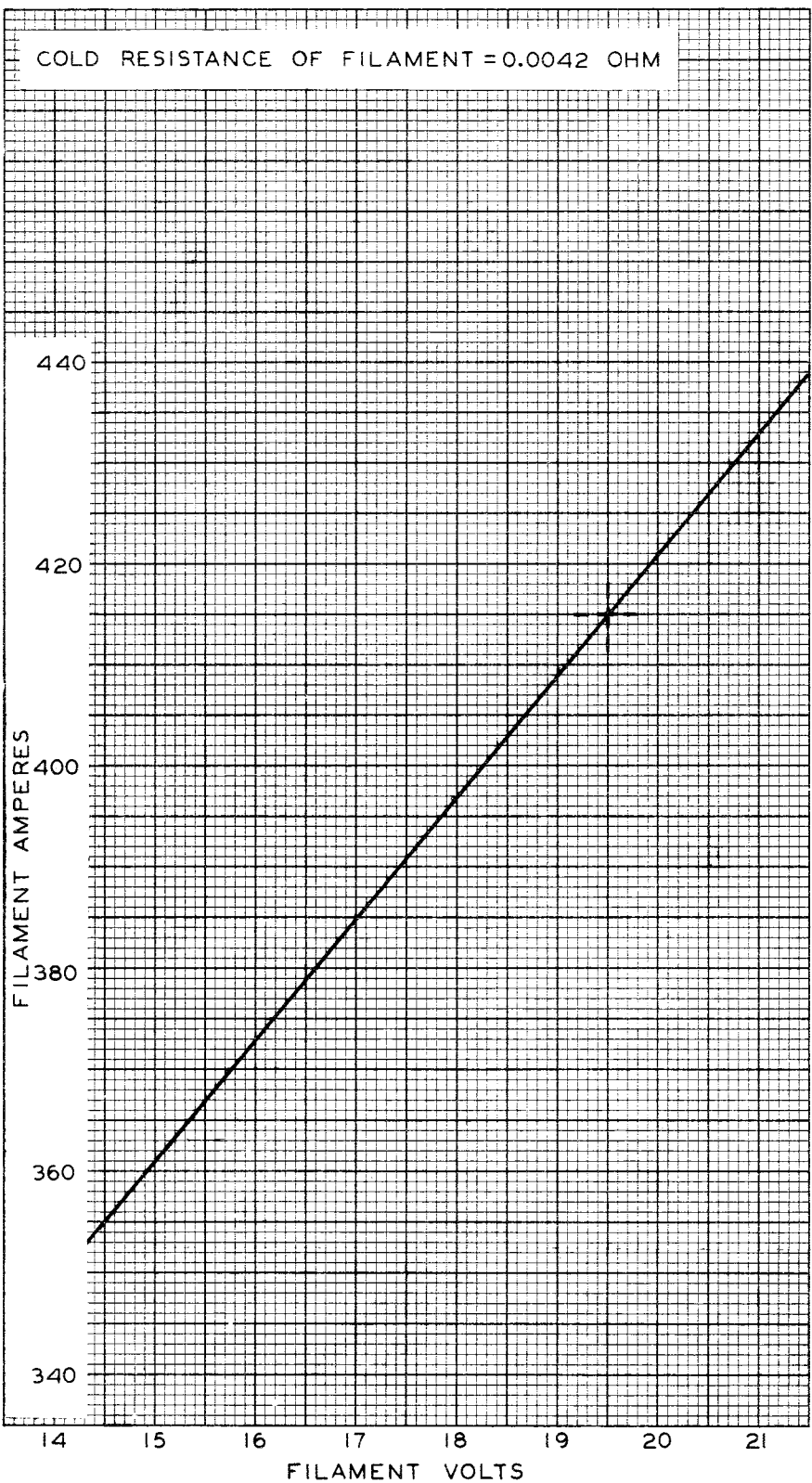


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AVERAGE FILAMENT CHARACTERISTIC

COLD RESISTANCE OF FILAMENT = 0.0042 OHM



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