7C24

POWER TRIODE

FORCED-AIR COOLED, GROUNDED-GRID TYPE

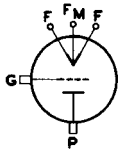
GENERAL DATA

Electrical:

Filament, Thoriated-Tungsten:		
Voltage	12.6 ± 0.6	ac or dc volts
Current	29	amp
Starting Current: The filament current must never exceed 175 amperes, even momentarily		
Cold Resistance	0.052	ohm
Amplification Factor	29	
Direct Interelectrode Capacitances (Approx.):		
Grid to Plate	18.5	μμf ←
Grid to Filament	19	μμf
Plate to Filament	0.5	μμf

Mechanical:

Terminal Connections:



F – Filament
FM – Filament Mid-Tap

G – Grid Terminal (Flange)
P – Plate Terminal (Radiator)

Mounting Position	Vertical, filament end up or down	←
Maximum Overall Length (Excluding flexible leads)	7-1/8"	
Diameter	4-5/8" ± 1/16"	
Radiator	Integral Part of Tube	
Air Flow:		←
Through Radiator:		

The specified air flow for various plate dissipations, as indicated in the tabulation below, should be delivered by a blower through the radiator before and during the application of any voltages. Filament power, plate power, and air may be removed simultaneously.

Plate Dissipation	1.2	1.6	2.0	kw
Min. Air Flow	110	190	275	cfm
Static Pressure	0.3	0.7	1.5	in. of water

To Heater and Filament Seals	10 min.	cfm

The specified air flow from a 1" -diameter nozzle should be directed into the filament header before and during the application of any voltages in order to limit the temperature of the filament seals and the grid seal to their respective maximum value.

Incoming Air Temperature	45 max.	°C
Radiator Temperature (Measured on the core at end away from incoming air)	180 max.	°C
Bulb Temperature (At hottest part)	150 max.	°C
Seal Temperature:		
Filament	175 max.	°C ←
Grid and Plate	150 max.	°C

Components:

Air Jacket	RCA Type No. 229F1	←

← Indicates a change.

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Air Manifold	RCA Type No. 230F1
Bracelet	RCA Type No. 231F1

AF POWER AMPLIFIER & MODULATOR - Class B

Maximum CCS• Ratings, *Absolute Values*:

DC PLATE VOLTAGE	5000 max.	volts
MAX.-SIG. DC PLATE CURRENT#	1.4 max.	amp
→ MAX.-SIG. PLATE INPUT#	5.5 max.	kw
PLATE DISSIPATION#	2 max.	kw

Typical Operation:

Values are for 2 tubes unless otherwise specified

DC Plate Voltage	5000	volts
DC Grid Voltage	−200	volts
Peak AF Grid-to-Grid Voltage	760	volts
Zero-Signal DC Plate Current	0.4	amp
Max.-Signal DC Plate Current	2.0	amp
Effective Load Resistance (Plate-to-plate)	6000	ohms
Max.-Signal Driving Power (Approx.)□	110	watts
Max.-Signal Power Output (Approx.)	7	kw

RF POWER AMPLIFIER - Class B Telephony

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

Maximum CCS• Ratings, *Absolute Values*:

DC PLATE VOLTAGE	5000 max.	volts
DC PLATE CURRENT	1.0 max.	amp
→ PLATE INPUT	3.3 max.	kw
PLATE DISSIPATION	2 max.	kw

Typical Operation in Grounded-Filament Circuit:

DC Plate Voltage	5000	volts
DC Grid Voltage	−200	volts
Peak RF Grid Voltage	190	volts
DC Plate Current	0.6	amp
Driving Power (Approx.)o▲	50	watts
Power Output (Approx.)	1.0	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	4000 max.	volts
DC GRID VOLTAGE	−1000 max.	volts

\# 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 required driving power.

▲ At crest of audio-frequency cycle with modulation factor of 1.0.

•, o: See next page. → Indicates a change.

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DC PLATE CURRENT	1.0 max.	amp
DC GRID CURRENT	0.3 max.	amp
PLATE INPUT	3.75 max.	kw ←
PLATE DISSIPATION	1.3 max.	kw

Typical Operation in Grounded-Filament Circuit:

DC Plate Voltage	4000	volts
DC Grid Voltage:		
from a fixed supply of	-350	volts
from a grid resistor of	1400	ohms
Peak RF Grid Voltage	570	volts
DC Plate Current	0.8	amp
DC Grid Current (Approx.)○	0.25	amp
Driving Power (Approx.)○	130	watts
Power Output (Approx.)	2.6	kw

RF POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

Key-down conditions per tube without amplitude modulation■

Maximum CCS● Ratings, *Absolute Values*:

DC PLATE VOLTAGE	5000 max.	volts
DC GRID VOLTAGE	-1000 max.	volts
DC PLATE CURRENT	1.4 max.	amp
DC GRID CURRENT	0.3 max.	amp
PLATE INPUT	5.5 max.	kw ←
PLATE DISSIPATION	2 max.	kw

Typical Operation in Grounded-Filament Circuit:

DC Plate Voltage	4000	5000	volts
DC Grid Voltage:			
from a fixed supply of	-350	-400	volts
from a grid resistor of	1250	1450	ohms
from a cathode resistor of	230	310	ohms
Peak RF Grid Voltage	650	650	volts
DC Plate Current	1.25	1.0	amp
DC Grid Current (Approx.)○	0.275	0.275	amp
Driving Power (Approx.)○	160	160	watts
Power Output (Approx.)	3.8	4.0	kw

Typical Operation in Grounded-Grid Circuit:

Same values as for Grounded-Filament Circuit with the following exceptions:

Driving Power (Approx.)	820	710	watts
Power Output	4.45	4.55	kw

● Continuous Commercial Service.

○ For effect of load resistance on grid current and driving power, refer to TUBE RATINGS—*Grid Current and Driving Power* in the 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.

← Indicates a change.

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RF POWER AMPLIFIER - Class C FM Telephony

Maximum CCS[●] Ratings and Typical Operation in Grounded-Grid Circuit

are the same as for

RF POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy

→ **CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

	Note	*Min.*	*Max.*	
Filament Current	1	27	31	amp
Amplification Factor	1,2	25	33	
Grid-Plate Capacitance . . .	-	16.5	20.5	μμf
Grid-Filament Capacitance. .	-	15.5	22.5	μμf
Plate-Filament Capacitance .	-	0.38	0.62	μμf

NOTE 1: With 12.6 volts ac on filament.

NOTE 2: With dc grid voltage of -25 volts and dc plate voltage adjusted to give dc plate current of 0.5 amp.

Data on operating frequencies for the 7C24 are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY

→ indicates a change.

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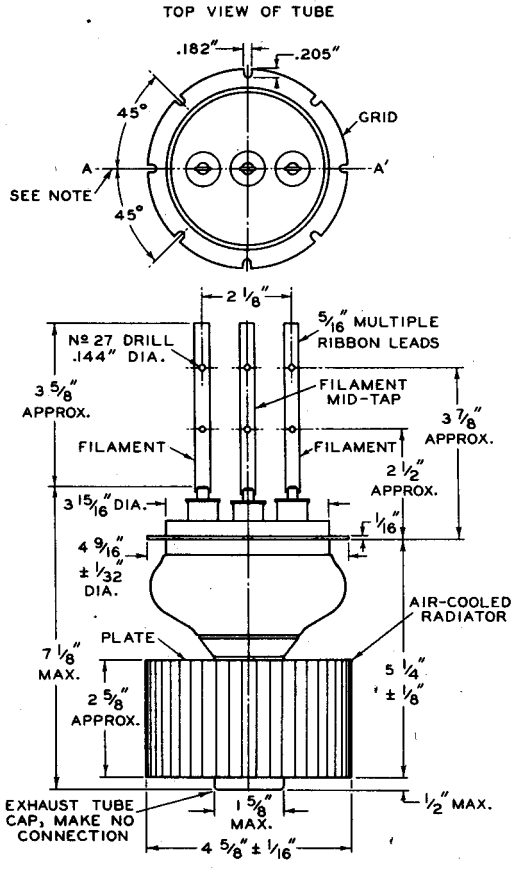

NOTE: PLANE OF FILAMENT LEADS WILL NOT DEVIATE MORE THAN 3-1/2° FROM PLANE PASSING THROUGH AA' NORMAL TO GRID FLANGE.

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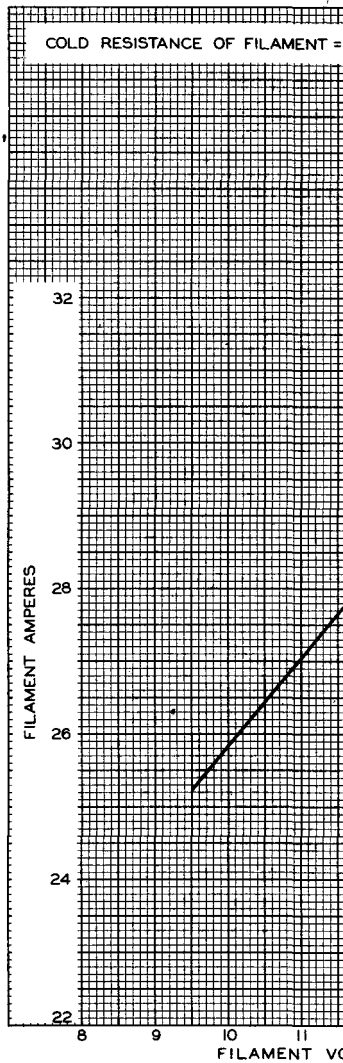
AVERAGE FILAMENT CHARACTERISTIC



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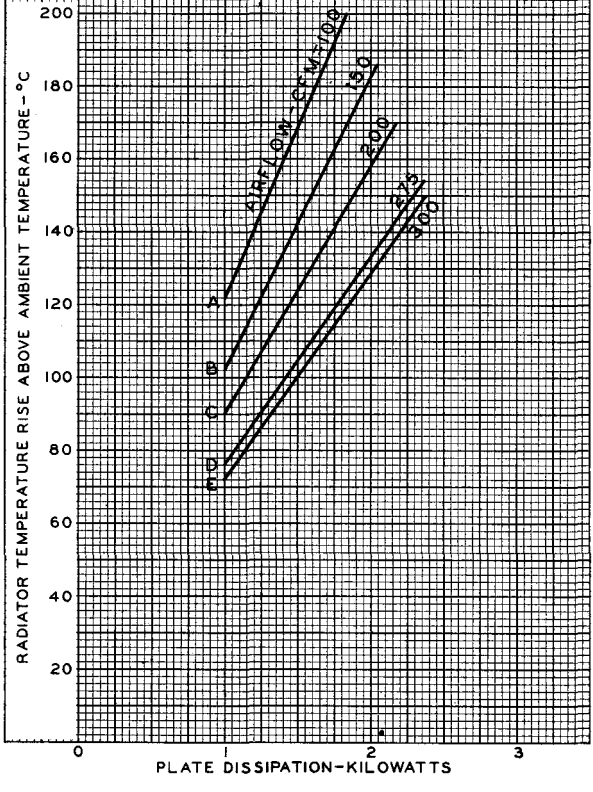
COOLING REQUIREMENTS

E_f = 12.6 VOLTS
MAXIMUM RADIATOR TEMPERATURE = 180°C

CURVE	PRESSURE DROP INCHES OF WATER
A	0.20
B	0.44
C	0.77
D	1.50
E	1.76

CURVES TAKEN ACCORDING TO NAFM* STANDARDS – BULLETIN Nº 103

*NATIONAL ASSOCIATION OF FAN MFRS., GENERAL MOTORS BLDG., DETROIT, MICH.



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RCA

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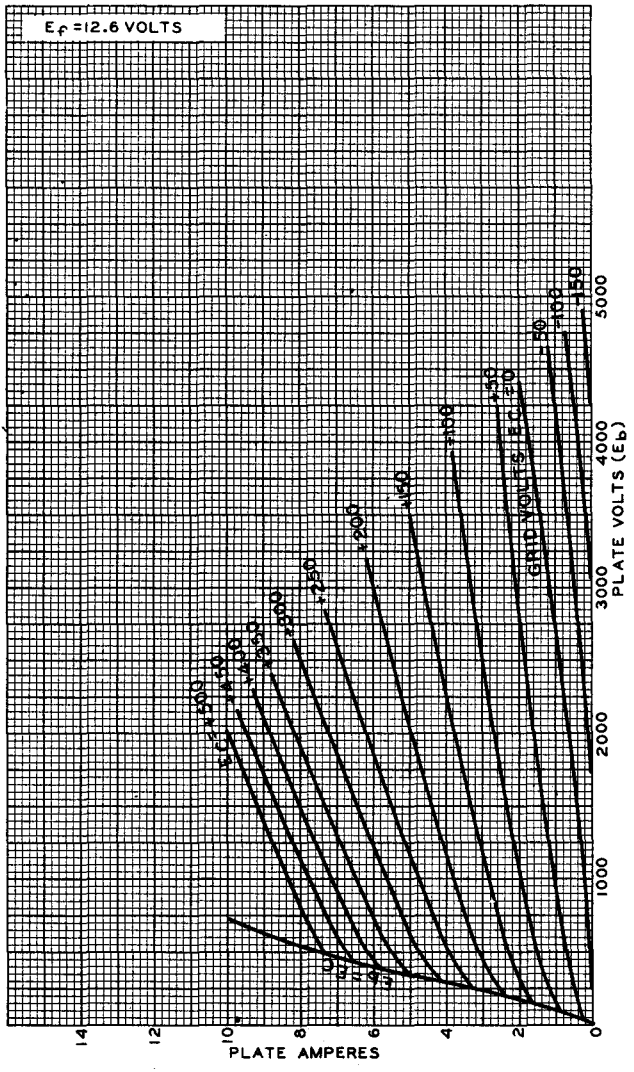
AVERAGE PLATE CHARACTERISTICS



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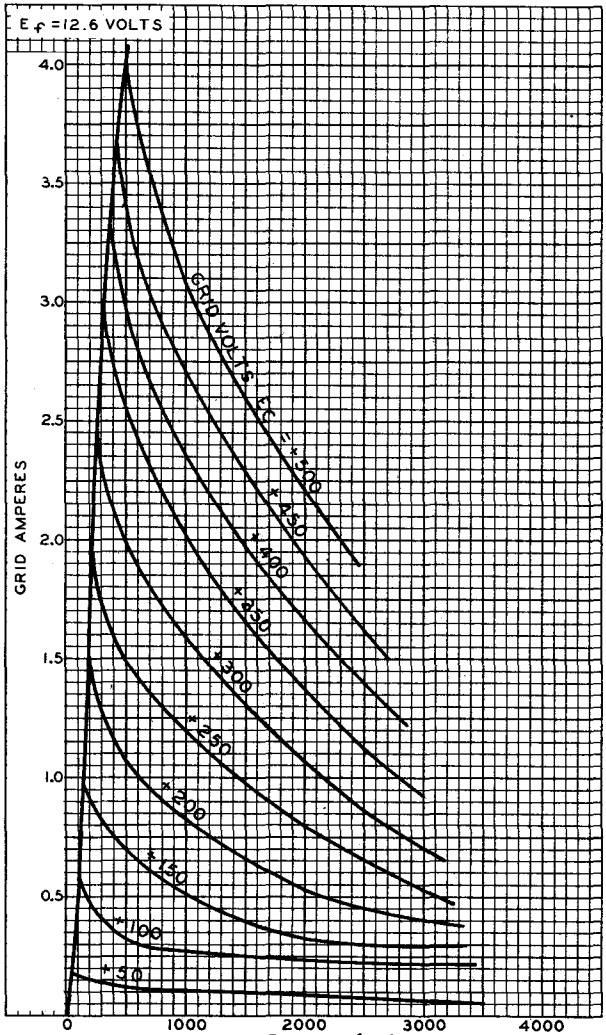
TYPICAL GRID CHARACTERISTICS



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RCA

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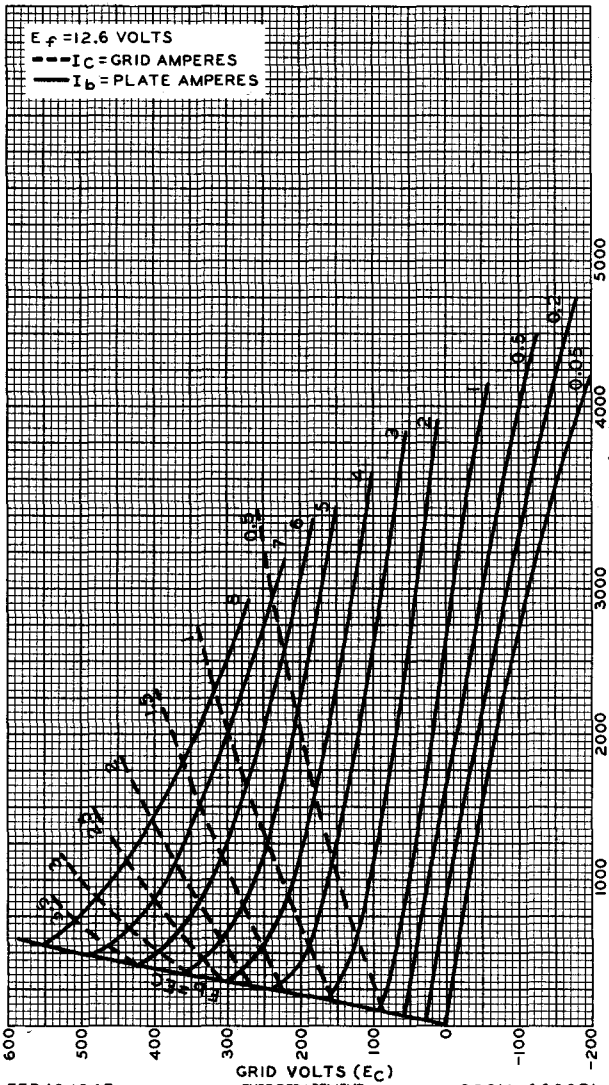
AVERAGE CONSTANT-CURRENT CHARACTERISTICS



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