



engineering data service

SYLVANIA

6X4

12X4

MECHANICAL DATA

Bulb	T-5½
Base	E7-1, Miniature Button 7-Pin
Outline	5-3
Basing	5BS
Cathode	Coated Unipotential
Mounting Position	Any

ELECTRICAL DATA

HEATER CHARACTERISTICS

	6X4	12X4
Heater Voltage¹	6.3	12.6 Volts
Heater Current	600	300 Ma
Heater-Cathode Voltage (Design Center Values)		
Heater Negative with Respect to Cathode		
Total DC and Peak	450	450 Volts Max.
Heater Positive with Respect to Cathode		
Total DC and Peak	100	100 Volts Max.

RATINGS (Design Center Values)

Peak Inverse Plate Voltage	1250 Volts	Max.
A C Plate Supply Voltage, R M S (Each Plate)	See Rating Chart I	
Steady State Peak Plate Current, Rating Chart II (Each Plate)	210 Ma	Max.
Transient Peak Plate Current, Rating Chart III (Each Plate)²	1.0 Ampere	Max.
D C Output Current (Each Plate)	See Rating Chart I	

CHARACTERISTICS

Tube Voltage Drop, $I_b = 70$ Ma Each Plate	22 Volts
---	----------

TYPICAL OPERATION

Full-Wave Rectifier-Capacitor Input

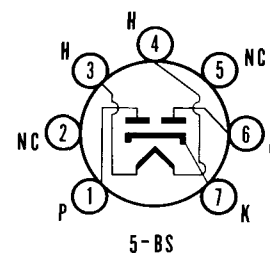
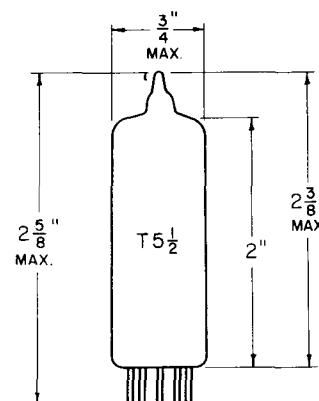
A C Plate Supply Voltage Per Plate	325 Volts
Filter Input Capacitor³	10 μ f
Total Effective Plate Supply Impedance (Per Plate)	525 Ohms
D C Output Current	70 Ma
D C Output Voltage at Filter Input (approx.)	
For D C Cathode Current of 35 Ma	365 Volts
70 Ma	310 Volts
Difference (Voltage Regulation)	55 Volts
Percentage Regulation	15 Percent

Full-Wave Rectifier Service — Choke Input

A C Plate Supply Voltage Per Plate (R M S)	450 Volts
Filter Input Choke	10 Henrys
D C Output Current	70 Ma
D C Output Voltage at Filter Input (approx.)	
For D C Cathode Current of 35 Ma	395 Volts
70 Ma	385 Volts
Difference (Voltage Regulation)	10 Volts
Percentage Regulation	2.5 Percent

QUICK REFERENCE DATA

The Sylvania Types 6X4 and 12X4 are miniature, full-wave, cathode type rectifiers. They are intended for service in compact a c or auto receivers where the average current is not in excess of 70 Ma. Except for heater current and voltage the 6X4 is identical to the 12X4.



SYLVANIA ELECTRIC
PRODUCTS INC.

RADIO TUBE DIVISION
EMPORIUM, PA.

Prepared and Released By The
TECHNICAL PUBLICATIONS SECTION
EMPORIUM, PENNSYLVANIA

MARCH 1956

NOTES:

1. The 6X4 and 12X4 are intended to be used in automotive service from a nominal 6 or 12 volt battery source. The heaters and maximum ratings of these tubes provide for an adequate safety factor such that they will withstand a wide variation in supply voltages.
2. If capacitor input circuits are to be used, protect the circuits against the possibility of hot-switching and do not exceed a maximum peak current value of one ampere during the initial cycles of the hot-switching transient.
3. Higher values of capacitance than indicated may be used, but the effective plate supply impedance may have to be increased to prevent exceeding the maximum rating for hot-switching transient plate current.

INTERPRETATION OF RATING CHARTS

Rating Charts I, II and III represent boundary conditions beyond which operation of the 6X4 and 12X4 is not permitted. With the aid of simple laboratory measurements and the use of the three charts, any application may be analyzed for proper rectifier type operation.

The boundaries of Rating Chart I are based on limits of supply voltage, plate dissipation and output current. These boundaries differ, depending upon the type of filter used. With capacitor input, operation is confined to the area bounded by FAEDG while for choke input, the entire area bounded by FABCDG may be used.

The boundary of Rating Chart II defines the limit of steady-state peak current. Operation within the boundary is permitted.

Rating Chart III defines the minimum value of effective plate supply resistance, per plate, for any given plate voltage supply which will assure that the surge currents are within a safe value.

$$R_s = N^2 R_{pri} + R_{sec} + R_a$$

Where: N — Voltage step up ratio of plate transformer.

R_{pri} — D C resistance of transformer primary.

R_{sec} — Average D C resistance of transformer secondary per section.

R_a — Added series resistance.

For any application, each Chart should be consulted. On *all* Charts the points of operation should fall within the proper boundaries.

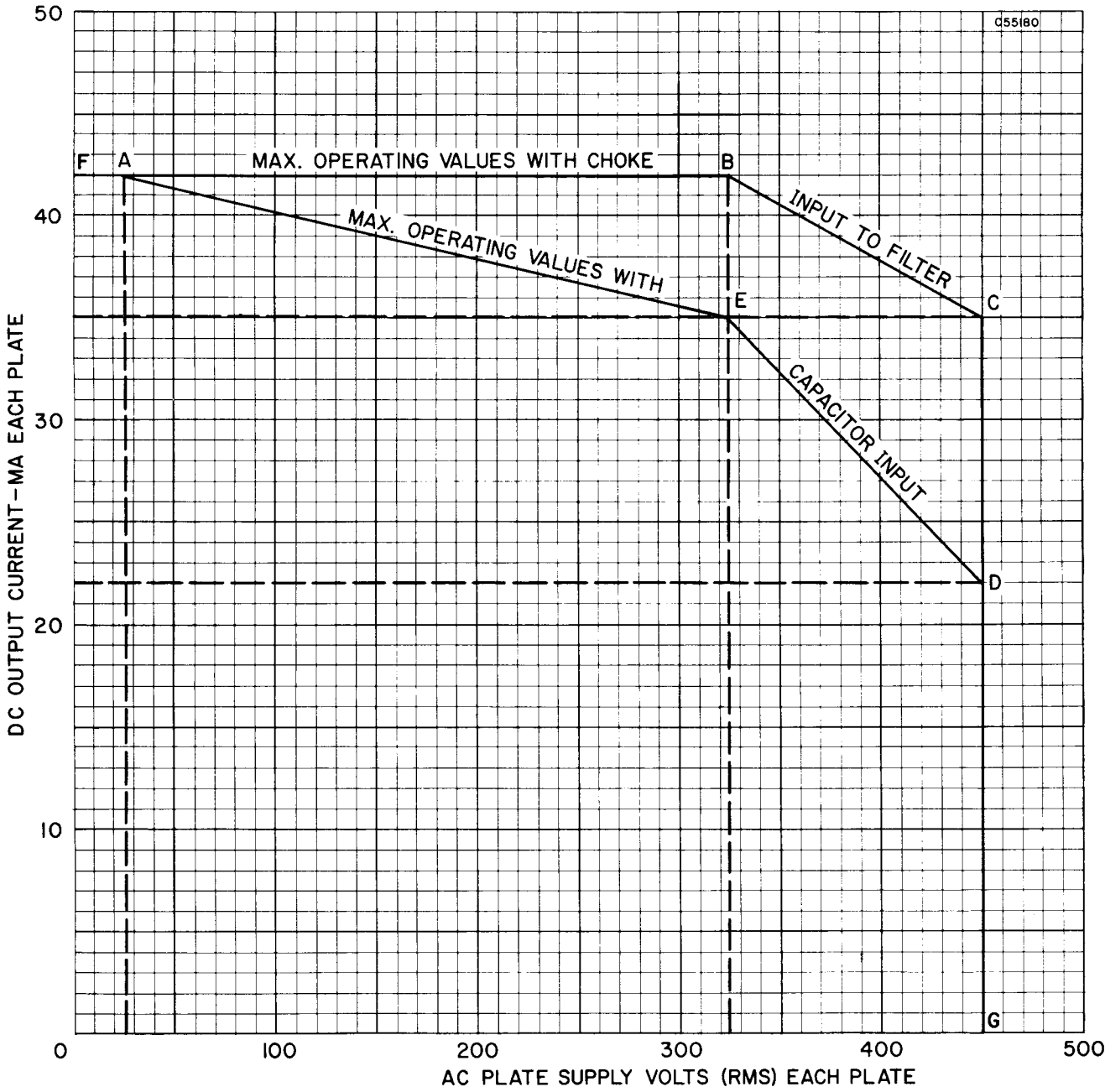
Plate supply voltages are measured with the rectifier tube non-conducting, i.e., with the transformer unloaded. This unloaded voltage is used when calculating rectification efficiency.

The rectification efficiency is defined as:

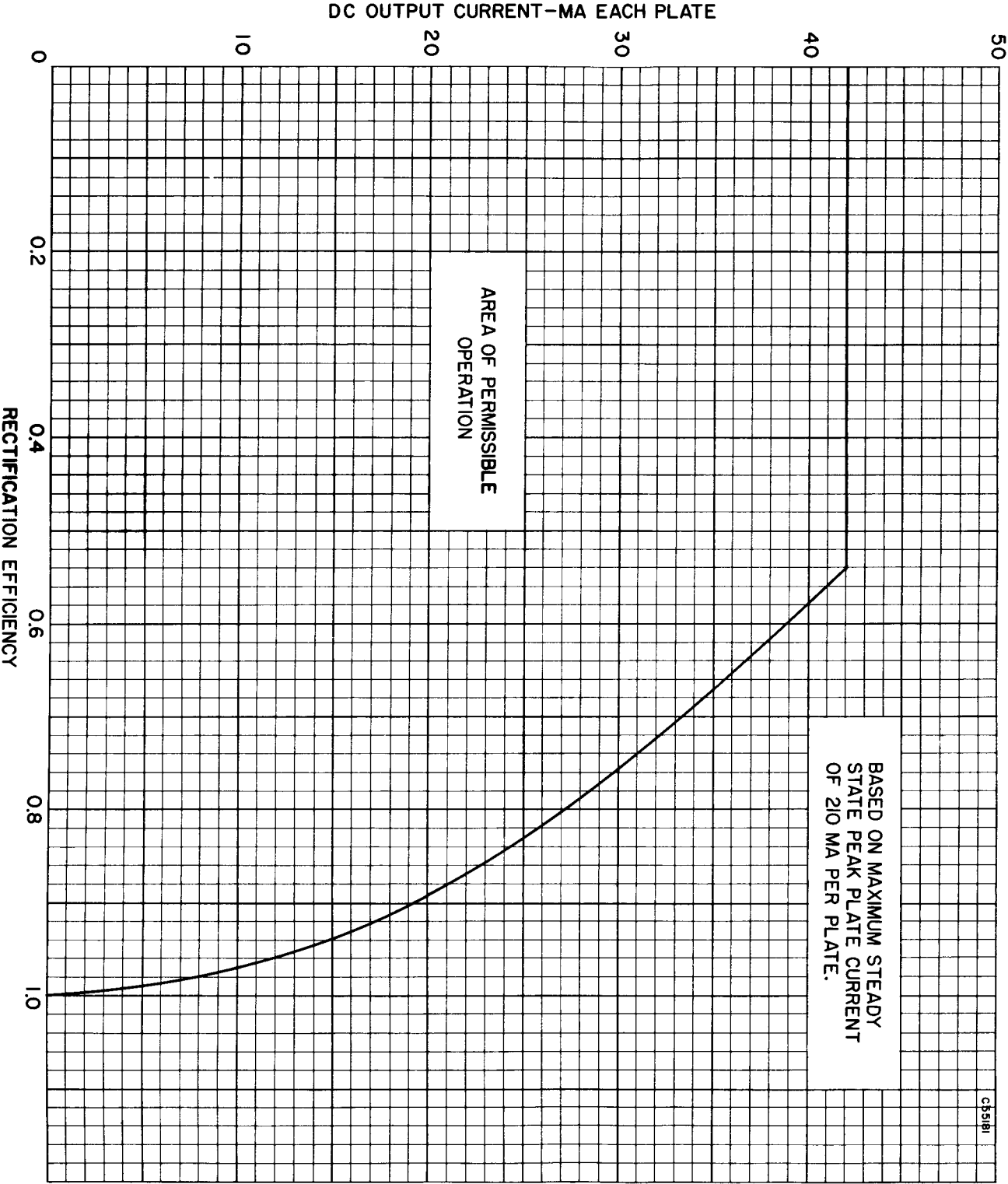
$$\frac{\text{D C Output Voltage}}{\sqrt{2} \text{ (Unloaded RMS Supply Voltage Per Plate)}}$$

The D C output voltage is measured at the input to the filter.

RATING CHART I



RATING CHART II



RATING CHART III

