MECHANICAL DATA

Bulb T-6½
Base . . . . E9-1 Miniature Button, 9-Pin
Outline 6-3
Basing 9DJ
Cathode . . . . Coated Unipotenial
Mounting Position . . . . Any

ELECTRICAL DATA

HEATER CHARACTERISTICS

	6BW4	12BW4	
Heater Voltage, A C or D C	6.3	12.6	Volts
Heater Current	900	450	Ma
Maximum Heater Cathode Voltage			
Heater Negative, D C		450	Volts

RATINGS (Design Center Values)[1]

Rectifier Service

Peak Inverse Plate Voltage . . . . 1275 Volts Max.
A C Plate Supply Voltage Each Plate, R M S
   (See Rating Chart I) . . . . 450 Volts Max.
D C Output Current . . . . See Rating Chart I
Steady State Peak Plate Current Each Plate
   (See Rating Chart II) . . . . 350 Ma Max.
Transient Peak Plate Current Each Plate
   (See Rating Chart III) . . . . 2.0 Amperes Max.

AVERAGE CHARACTERISTICS

Tube Voltage Drop
   Tube Conducting:
      100 Ma Each Plate . . . . 40 Volts

TYPICAL OPERATION

Full Wave Rectifier — Capacitor Input Filter
A C Plate Supply Voltage Each Plate,
   R M S[2] . . . . 325 Volts
Filter Input Capacitor . . . . 40 µf
Effective Plate Supply Resistance
   Each Plate . . . . 82 Ohms
D C Output Current . . . . 100 Ma
D C Output Voltage at Filter Input . . . . 330 Volts

Full Wave Rectifier — Choke Input Filter
A C Plate Supply Voltage Each Plate,
   R M S[2] . . . . 450 Volts
Filter Input Choke . . . . 10 Henrys
D C Output Current . . . . 100 Ma
D C Output Voltage at Filter Input . . . . 360 Volts
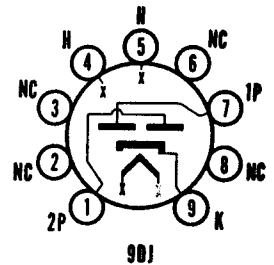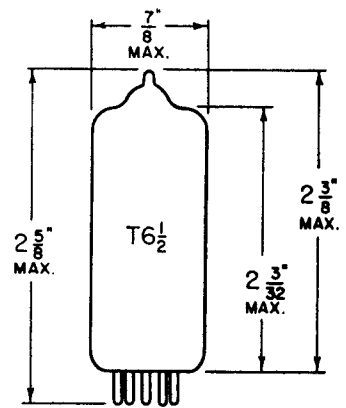
NOTES:

1. See "Interpretation of Rating Charts".

2. A C plate voltage is measured without load.

QUICK REFERENCE DATA

The Sylvania 6BW4 and 12BW4 are miniature cathode type full wave rectifiers featuring relatively high output current capabilities.

The 12BW4 is intended primarily for use in auto receivers having a 12 volt heater supply.

SYLVANIA ELECTRIC PRODUCTS INC.

RADIO TUBE DIVISION
EMPORIUM, PA.

NOTES: (Continued)

3. The 12BW4 is intended to be used in automotive service from a nominal 12 volt battery source. The heater is therefore designed to operate over the 10.0 to 15.9 voltage range encountered in this service. The maximum ratings of the tube provide for an adequate safety factor such that the tube will withstand the wide variation in supply voltages.

INTERPRETATION OF RATING CHARTS

Rating Charts I, II and III represent boundary conditions beyond which operation of the 6BW4 and 12BW4 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.
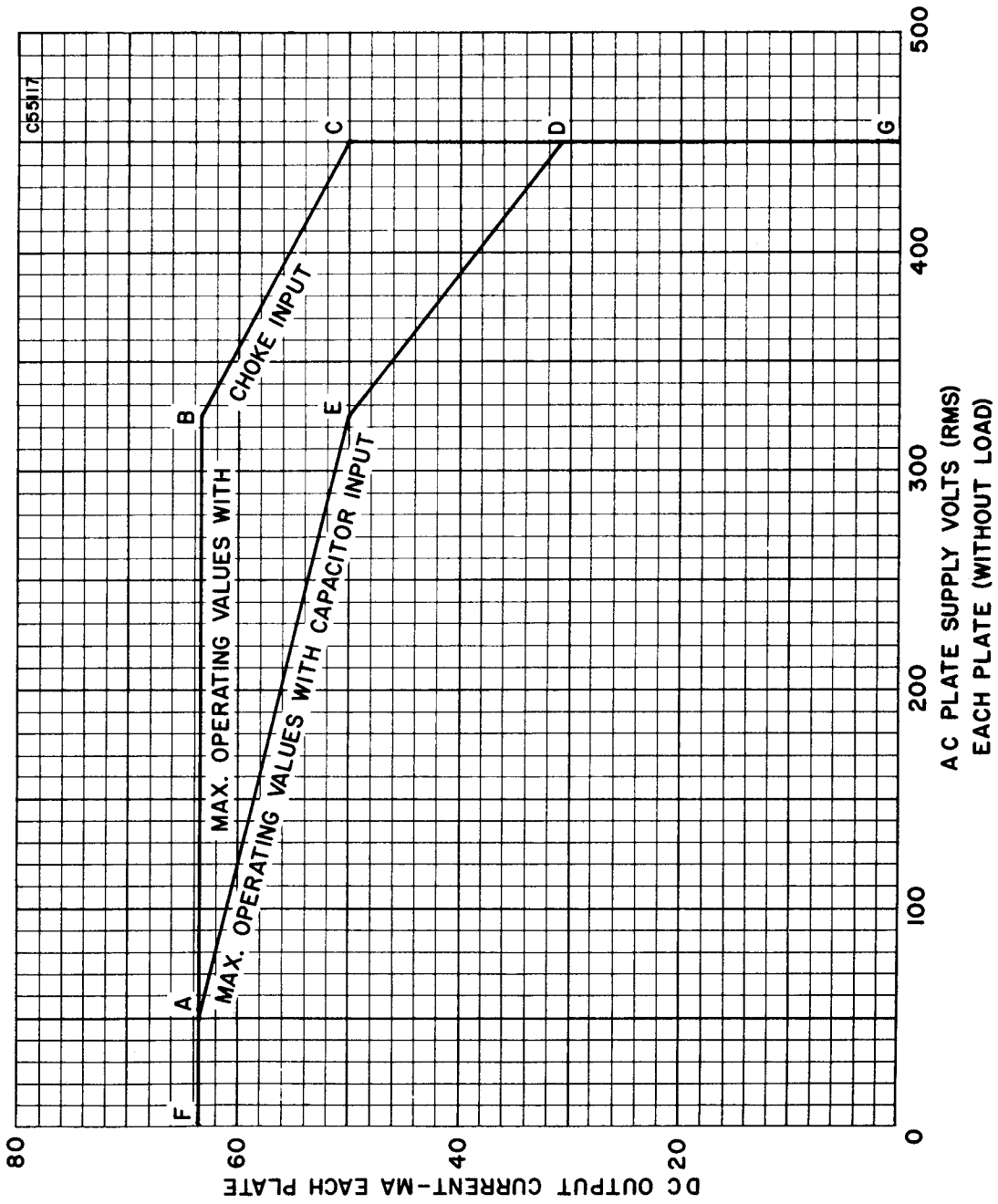
Plate supply voltages are measured with the rectifier tube non-conducting, i.e., with the transformer unloaded. This unloaded voltage is used when calculating rectification efficiency.

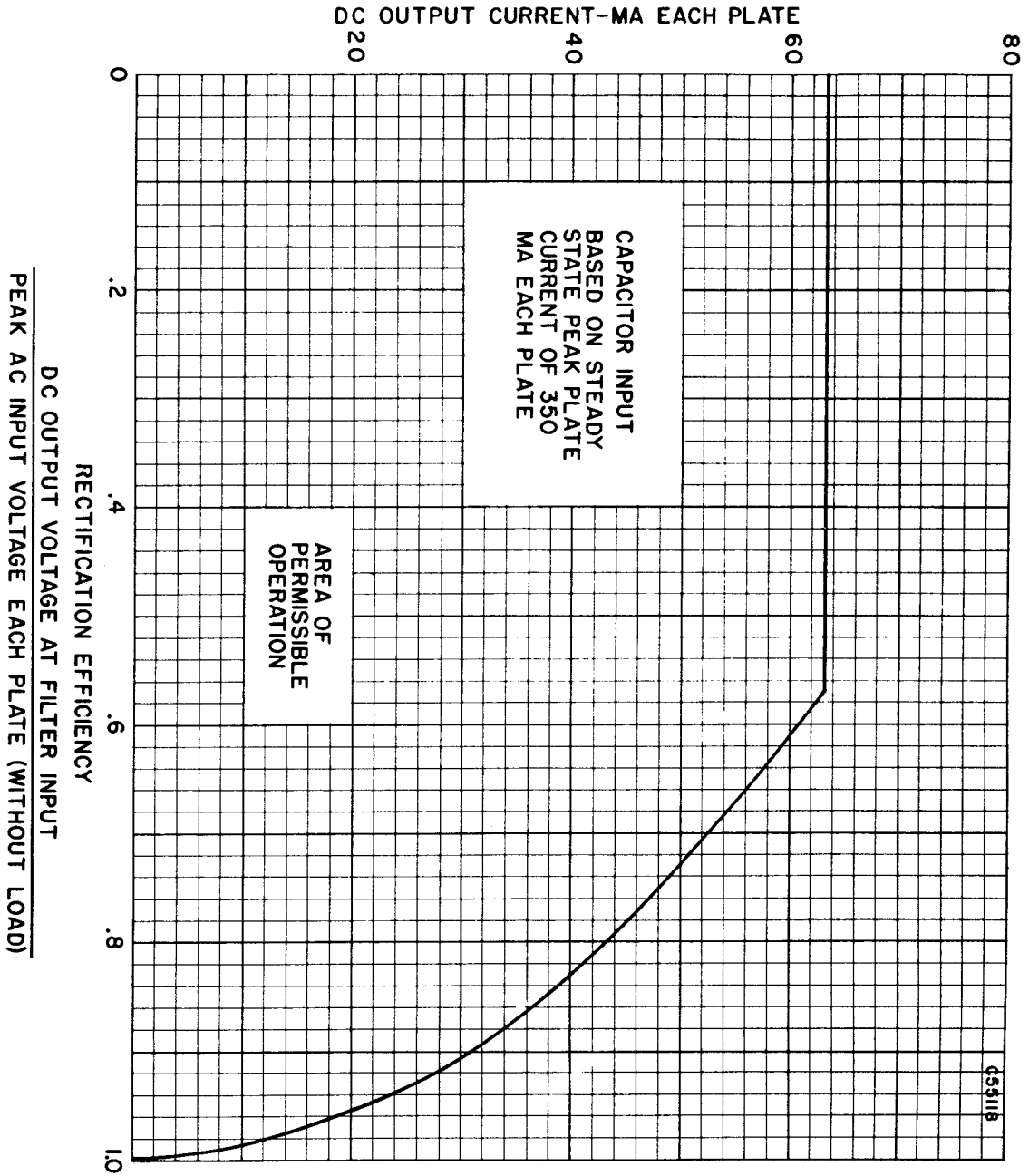The rectification efficiency is defined as:

$$\frac{\text{D C Output Voltage}}{\sqrt{2} \ (\text{R M S Supply Voltage Per Plate})}$$

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

RATING CHART I

Rating Chart I showing DC Output Current—Ma Each Plate (vertical axis, 0 to 80) versus AC Plate Supply Volts (RMS) Each Plate (Without Load) (horizontal axis, 0 to 500). Curves labeled: Max. Operating Values with Choke Input (points A, B, C), Max. Operating Values with Capacitor Input (points F, E, D, G). Chart reference C55117.

RATING CHART II

DC OUTPUT CURRENT—MA EACH PLATE

CAPACITOR INPUT
BASED ON STEADY
STATE PEAK PLATE
CURRENT OF 350
MA EACH PLATE

AREA OF
PERMISSIBLE
OPERATION

RECTIFICATION EFFICIENCY
DC OUTPUT VOLTAGE AT FILTER INPUT
PEAK AC INPUT VOLTAGE EACH PLATE (WITHOUT LOAD)

C55118

RATING CHART III