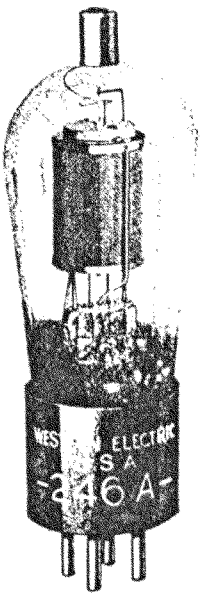
# *Western Electric*

## 246A Vacuum Tube




**Classification—Voltage-amplifier, filamentary, screen-grid tetrode**

An important feature of the 246A tube is its low filament power consumption.

**Applications**

Carrier and radio-frequency voltage amplifier

Detector

Audio-frequency voltage amplifier

**Dimensions**—Dimensions, outline diagrams of the tube and base, and the arrangement of the electrode connections to the base terminals are shown in Figures 1 and 2.

**Base**—Medium, four-pin thrust type with bayonet pin. Small, metal cap control-grid terminal at the top of the bulb.

**Socket**—Standard, four-contact type, such as the Western Electric 143B socket.

**Mounting Positions**—The 246A tube may be mounted in any position.

## Average Direct Interelectrode Capacitances

| | A | B | |
|---|---|---|---|
| Control grid to plate | 0.020 | 0.010 | μμf |
| Control grid to filament and screen grid | 4.0 | 5.2 | μμf |
| Plate to filament and screen grid | 8.3 | 8.8 | μμf |

Column A—Without shield.

Column B—With close-fitting metal shield connected to filament.

## Filament Rating

| | |
|---|---|
| Filament current | 0.100 ampere, d.c. |
| Nominal filament voltage | 3.3 volts |

The filament of this tube is designed to operate on a current basis and should be operated at as near the rated current as is practicable.

**Characteristics**—Plate current and screen-grid current characteristics of a typical 246A tube are shown as functions of plate voltage for several values of control-grid voltage in Figures 3 and 4 for screen-grid voltages of 45 and 67.5 volts, respectively. The plate, screen-grid, and control-grid voltages are measured from the negative end of the filament. Plate current, screen-grid current, and transconductance characteristics are given in Figures 5, 6 and 7, respectively, as functions of control-grid voltage for the same two values of screen-grid voltage and three values of plate voltage. Corresponding amplification factor and plate resistance characteristics are given in Figures 8, 9, 10 and 11.

## Typical Operating Conditions

| Plate Voltage | Screen-Grid Voltage | Control-Grid Bias | Plate Current | Screen-Grid Current | Amplification Factor | Plate Resistance | Transconductance |
|---|---|---|---|---|---|---|---|
| Volts | Volts | Volts | Milliamperes | Milliamperes | | Ohms | Micromhos |
| 135 | 45.0 | −1.5 | 1.50 | 0.20 | 285 | 725000 | 390 |
| *135 | 67.5 | −3.0 | 2.85 | 0.30 | 165 | 325000 | 510 |
| *180 | 45.0 | −1.5 | 1.55 | 0.15 | 335 | 820000 | 410 |

*Maximum operating conditions.

**Circuit Requirements**—Screen-grid tubes are particularly well suited for use in high-frequency amplifiers and are capable of developing comparatively high gain per stage. In order to avoid undesired feed-back in the circuit, it is usually necessary to observe the following precautions: (1) use of a close-fitting shield around each tube, (2) shielding of each stage of the amplifier circuit, (3) use of a low-impedance condenser between the screen grid and filament of each tube, (4) filtering of each battery lead to each tube, and (5) minimization of impedances common to the plate, screen-grid, control-grid, or filament circuits of two or more tubes.

The screen-grid voltage should be obtained either directly from a low-resistance source or from a voltage divider. The use of a series resistance to reduce a high voltage supply to the desired value is not recommended because screen-grid currents differ widely in different tubes and vary during life in individual tubes.

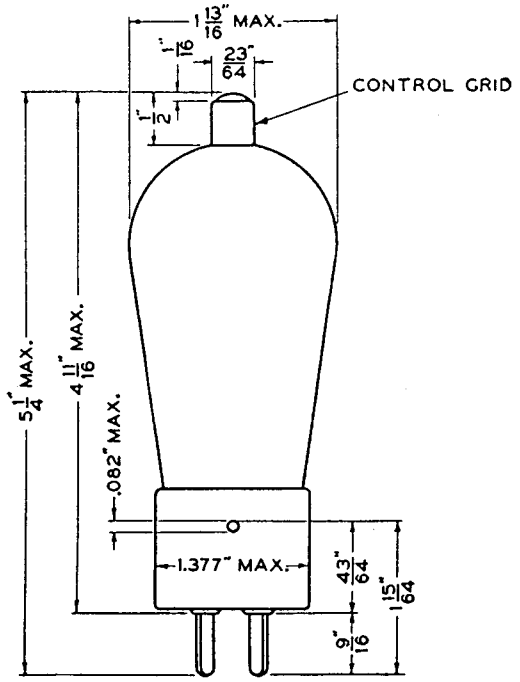

1 13/16" MAX.
1/16"
23/64"
CONTROL GRID
1/2"
5 1/4" MAX.
4 11/16" MAX.
.082" MAX.
1.377" MAX.
43/64"
15/64"
9/16"

FIG. 1

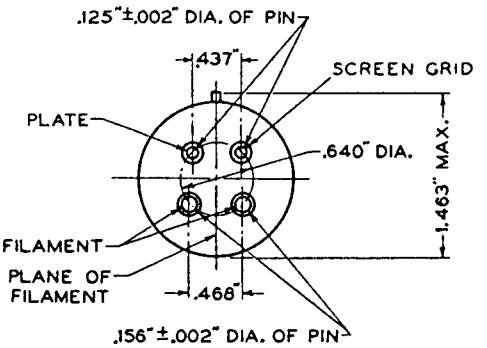

.125"±.002" DIA. OF PIN
.437"
SCREEN GRID
PLATE
.640" DIA.
1.463" MAX.
FILAMENT
PLANE OF FILAMENT
.468"
.156"±.002" DIA. OF PIN

FIG. 2

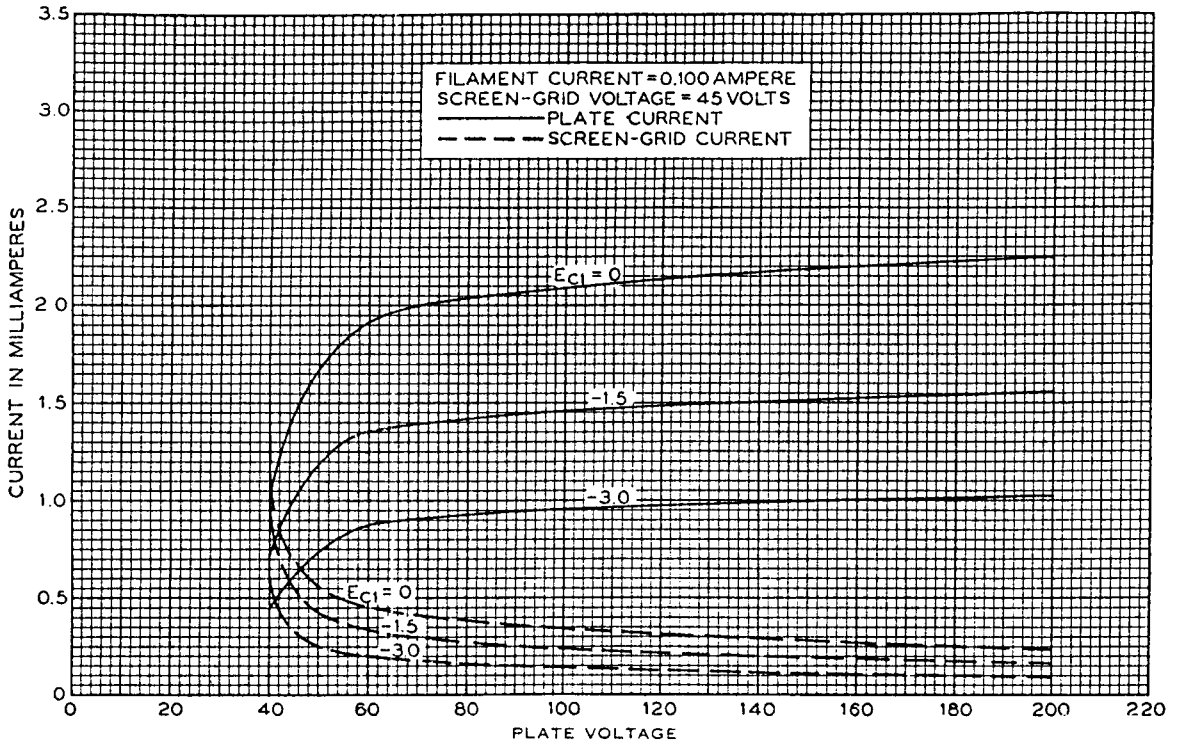

FILAMENT CURRENT = 0.100 AMPERE
SCREEN-GRID VOLTAGE = 45 VOLTS
PLATE CURRENT
SCREEN-GRID CURRENT
$E_{C1} = 0$
-1.5
-3.0
$E_{C1} = 0$
-1.5
-3.0
CURRENT IN MILLIAMPERES
PLATE VOLTAGE
0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
0
20
40
60
80
100
120
140
160
180
200
220

FIG. 3

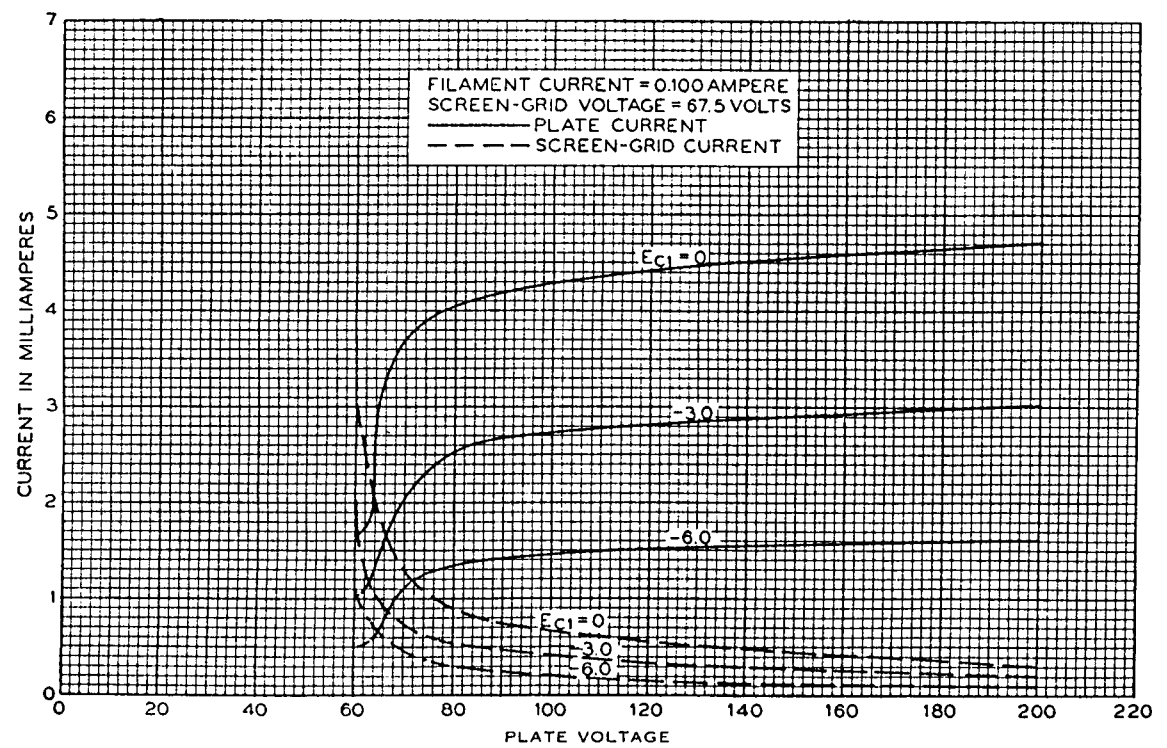

FILAMENT CURRENT = 0.100 AMPERE
SCREEN-GRID VOLTAGE = 67.5 VOLTS
PLATE CURRENT
SCREEN-GRID CURRENT
$E_{C1} = 0$
-3.0
-6.0
$E_{C1} = 0$
-3.0
-6.0
CURRENT IN MILLIAMPERES
PLATE VOLTAGE
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
140
160
180
200
220

FIG. 4

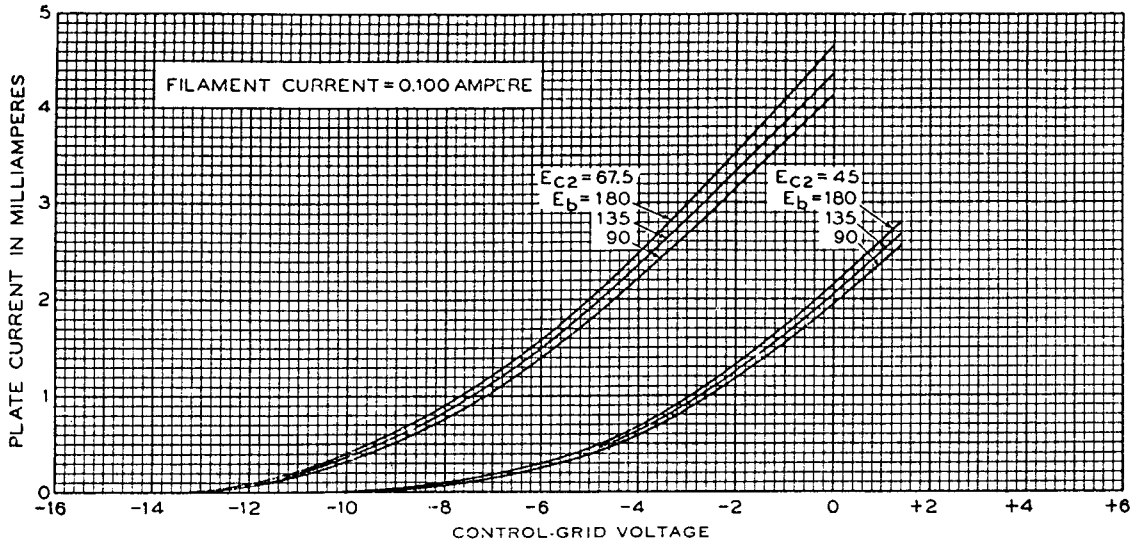



FIG. 5

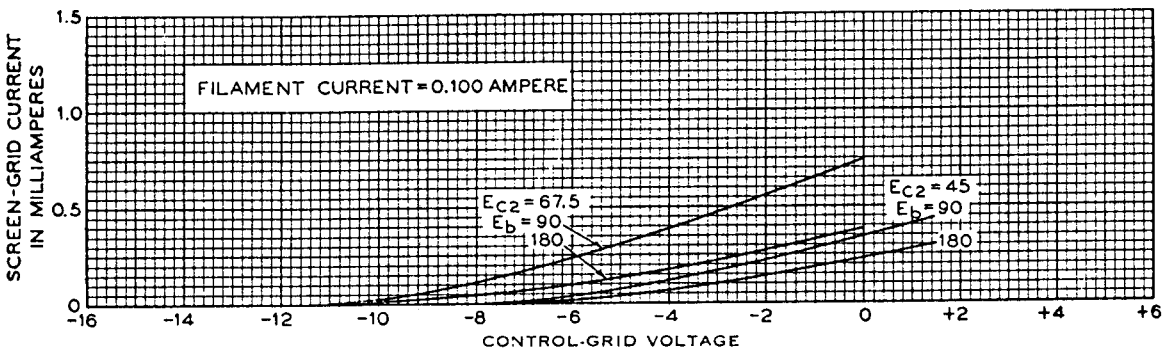



FIG. 6

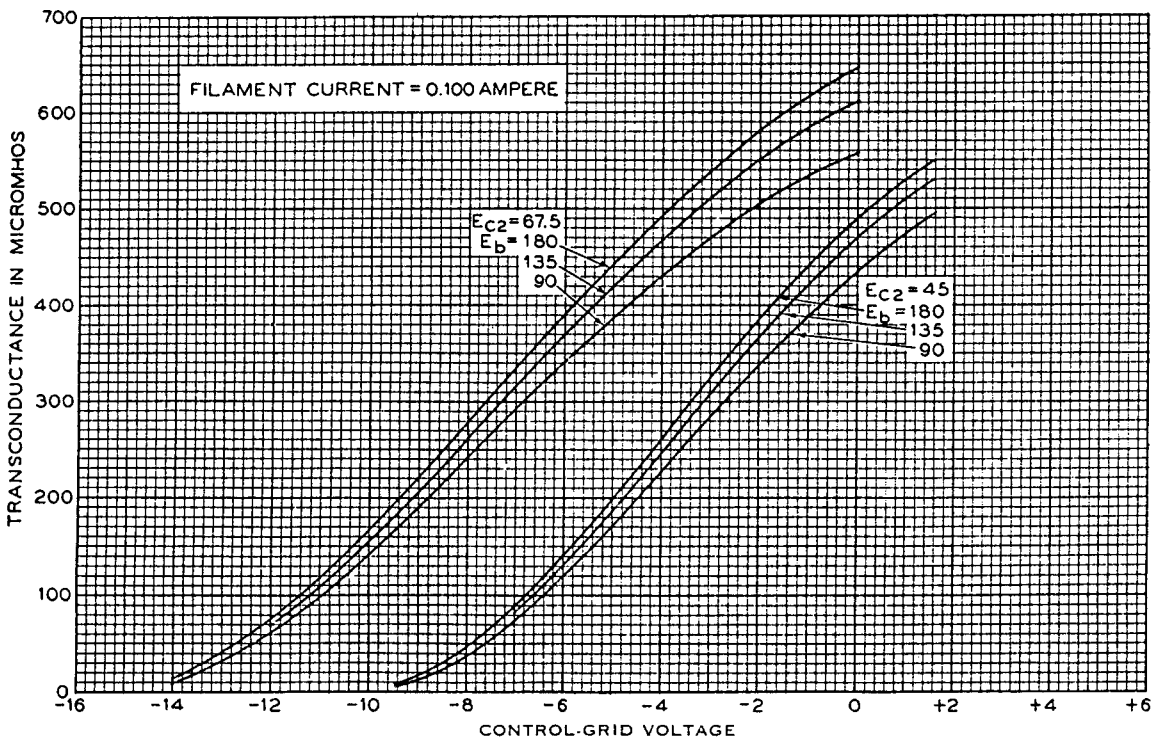



FIG. 7

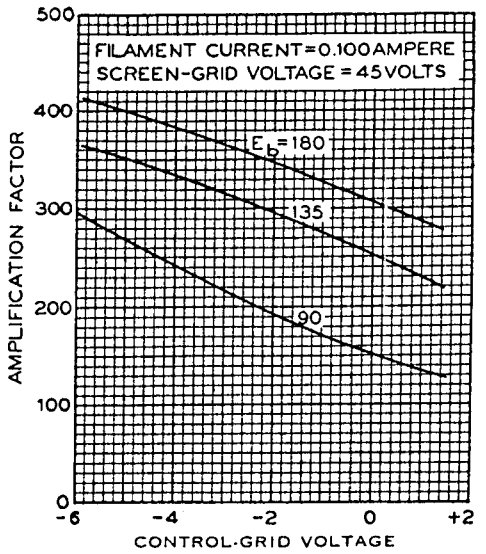



FIG. 8

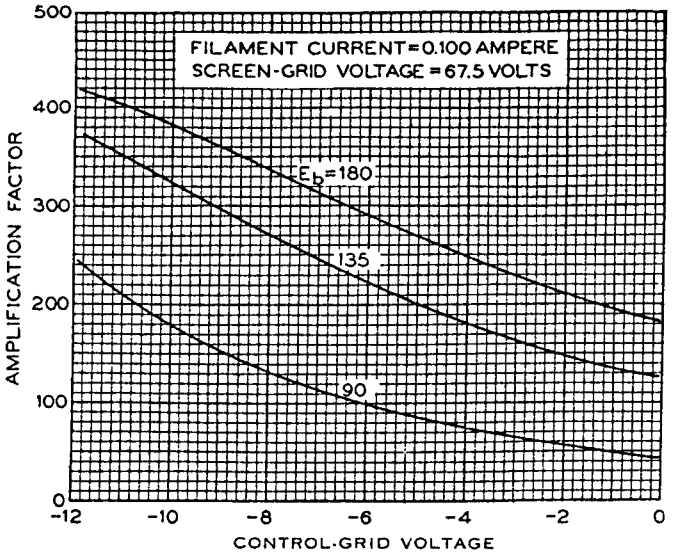



FIG. 9

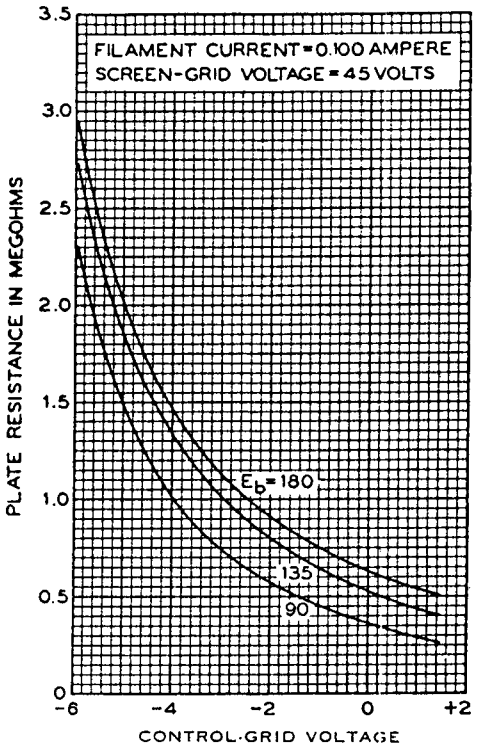



FIG. 10

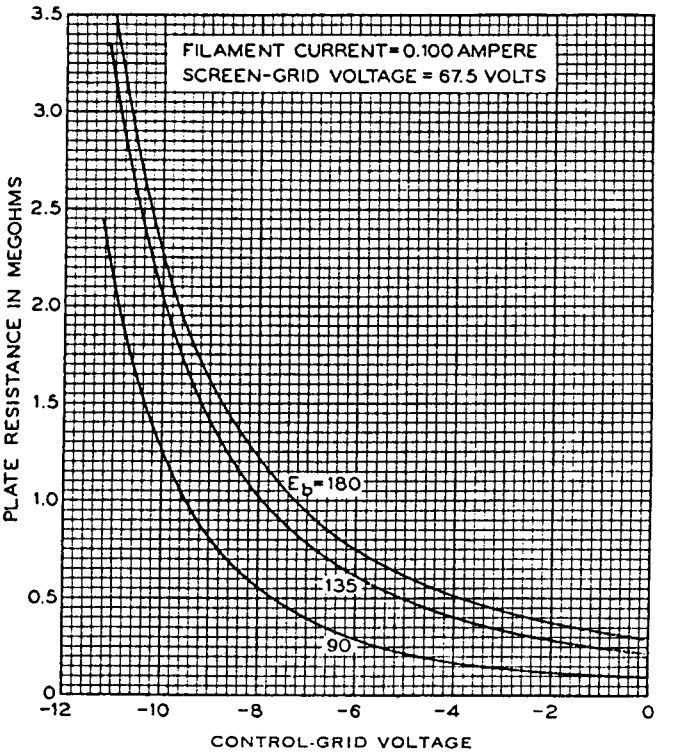



FIG. 11

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A development of Bell Telephone Laboratories, Incorporated, the research laboratories of the American Telephone and Telegraph Company, and the Western Electric Company

V. T. DATA SHEET 246A
ISSUE 1