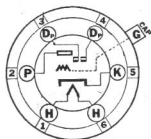


Sylvania  
**TYPE 75**  
DUODIODE  
HIGH-MU TRIODE



**CHARACTERISTICS**

Heater Voltage AC or DC . . . . .	6.3 Volts
Heater Current . . . . .	0.3 Ampere

**Direct Interelectrode Capacitances, Triode Unit (Approx.):**

Grid-Plate . . . . .	1.7 $\mu\mu\text{f}$
Input . . . . .	1.7 $\mu\mu\text{f}$
Output . . . . .	3.8 $\mu\mu\text{f}$
Maximum Over-all Length . . . . .	4 $\frac{1}{32}$ "
Maximum Diameter . . . . .	1 $\frac{1}{16}$ "
Bulb . . . . .	ST-12
Cap . . . . .	Small Metal
Base—Small 6-Pin . . . . .	6-G

**Operating Conditions and Characteristics:**

CLASS A AMPLIFIER (TRIODE UNIT)

Heater Voltage . . . . .	6.3 Volts
Plate Voltage . . . . .	250 Volts Max.
Grid Voltage † . . . . .	-2 Volts
Plate Current † . . . . .	1.0 Ma.
Plate Resistance . . . . .	91000 Ohms
Mutual Conductance . . . . .	1100 $\mu\text{mhos}$
Amplification Factor . . . . .	100

† These are rating values only and not operating points with coupling resistor. See "Circuit Application."

**CIRCUIT APPLICATION**

Sylvania 75 is a heater type of tube embodying two diodes and a triode in a single bulb. In design it resembles an 85 but offers a triode unit with an amplification factor of 100 as compared with a value of 8.3 for the Type 85.

The diode units are independent from each other and from the triode except for a common cathode sleeve having one emitting surface for the diodes and another for the triode section. This arrangement adds greater flexibility in circuit design since it permits the diodes to perform the functions of detection and of automatic volume control while the triode is being used as an amplifier.

**Detector:**

The diodes may be used either in a full-wave or in a half-wave circuit. In the latter case, one plate only, or the two plates in parallel, may be employed. The half-wave arrangement will furnish approximately twice the a-v-c voltage as compared with the full-wave circuit. If a remote cut-off tube such as Type 39/44 is employed then half-wave detection (using the two diode plates in parallel) will deliver sufficient control voltage for satisfactory operation. For tubes such as Type 36, which reach cut-off at relatively low voltages, full-wave rectification may be utilized since the a-v-c voltage produced will be ample to control these tubes satisfactorily. The 75 will give the equivalent performance of a 57 as a detector with the advantage of less distortion due to diode detection.

**Automatic Volume Control:**

The required voltage may be obtained by utilizing one of the diode plates for this purpose alone. This will confine the sensitivity and time delay function to the resistance and condenser

combination having the desired time constant. The sensitivity control action is determined by applying sufficient negative voltage to the a-v-c diode plate to obtain the desired reduction. Adequate filters should be used in the grid return circuits of all tubes which are being controlled to prevent coupling between the different stages, especially between the r-f and i-f stages in superheterodyne receivers. In each circuit resistors as high as a half megohm may be required to prevent poor quality at low volume.

### **Amplifier:**

The triode may be used in conventional circuit arrangements. However, because of its high amplification factor it cannot be employed as a "diode biased" amplifier, that is, the grid bias cannot be obtained by utilizing the variable voltage drop caused by the rectified current flowing through a resistor in the detector circuit since the bias voltage developed will drive the triode section beyond cut-off with the result that the quality will be poor, especially with high signal. The triode should be resistance coupled to the diode using an ordinary coupling condenser and a half megohm leak to ground. To provide sufficient bias voltage it will be necessary to insert in the cathode return of the tube a resistor whose value will depend upon the resistance which is in the plate circuit, and upon the plate current desired.

Type 75 is a voltage amplifier and not a power device and, therefore, should not be used as a driver tube under any circumstances. When resistance coupled to a 41 it is capable of supplying sufficient voltage, even with low percentage modulation, to obtain full power output from the pentode.

Numerous illustrations which indicate how the Type 75 may be employed will be found incorporated in the **Typical Receiver Circuits** shown on Pages 161, 162, 164, 168 and 169. These include AC, AC-DC, DC and automobile radio receivers. It is evident that the Type 75 has found wide application in receiver design.