

MECHANICAL DATA

Bulb	T-5 ½
Base	7 Pin Miniature
Pin Connections	See Drawing
Outline	See Drawing
Mounting Position	Any

ELECTRICAL DATA

ABSOLUTE RATINGS

	Min.	Max.
Hold-Off Voltage ¹	—	1500 Volts
Anode Voltage ³	500	1000 Volts
Trigger Grid Firing Voltage ⁴	180	— Volts
Trigger Grid Bias Voltage	—	90 Volts
Power Input ²	—	1 Watt
Peak-Cathode Current	10	— Amps

TYPICAL OPERATION

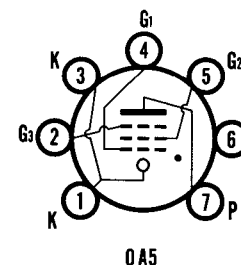
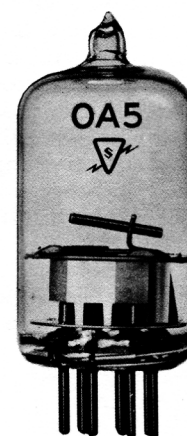
Anode Voltage	750 Volts
Trigger Grid Bias	+90 Volts
Trigger Pulse Voltage	160 Volts
Discharge Capacitor	0.25 μ fd
Keep-Alive Current	50 μ a
Frequency ²	1 pps
Power Input ²	0.07 Watt

NOTES:

1. Hold-off voltage is defined as the greatest anode voltage at which the tube will not fire without the application of a triggering pulse to the trigger grid. It depends on the circuit design and the voltage-current conditions.
2. The maximum power input is given by $W = 1/2CV^2f$, where C is the discharge capacitance in microfarads, V is the anode voltage in kilovolts and f is the number of flashes or pulses per second. This relation also determines the maximum repetition rate.
3. Operation with anode voltages as low as 350 V. is possible, but will require considerably higher trigger pulse voltages.
4. The minimum trigger grid firing voltage is defined as the minimum instantaneous grid potential required to fire the tube. This potential is the sum of the steady bias voltage and trigger grid pulse voltage.

QUICK REFERENCE DATA

The Sylvania Type OA5 is a ruggedized cold cathode trigger tube for electronic relay and switching service.



SYLVANIA
ELECTRONIC TUBES
 A Division of
 Sylvania Electric Products Inc.
RECEIVING TUBE
OPERATIONS
EMPORIUM, PA.
Prepared and Released By The
TECHNICAL PUBLICATIONS SECTION
EMPORIUM, PENNSYLVANIA
 DECEMBER, 1963
 PAGE 1 OF 4
File Under
SPECIAL PURPOSE
ELECTRONIC TUBES

APPLICATION DATA

The Sylvania Type OA5 trigger tube is an inert-gas-filled internally-triggered cold cathode trigger tube specifically designed for electronic relay and switching service involving extremely high instantaneous peak currents—of the order of hundreds of amperes—at low average current levels. The OA5 is constructed so that it will be fired by positive grid pulses. The special design of this tube results in several important features:

First, the use of a keep-alive grid among other techniques insures relatively stable triggering characteristics throughout life, a fact which will be of benefit in many varied types of equipment.

The time required to initiate the arc (delay time) has been reduced to a value of only a few microseconds. The de-ionization time has been decreased as well.

The trigger grid requirements have been reduced to a very low value (microamperes). Because of this fact, for example, it is possible, with high-intensity light flashes, to trigger the Sylvania OA5 directly from a phototube without intervening amplifiers. The tube directly bridges the gap between very low instantaneous current levels and very high instantaneous current levels.

This tube is rated at anode potentials up to the high level of 1000 volts.

The Sylvania Type OA5 measures only $1\frac{5}{8}$ " in overall height and $\frac{3}{4}$ " in diameter.

This tube has been designed specifically for trigger tube applications and is not intended for stroboscopic applications which utilize the light flashes produced by the arc. Among the applications for which this tube is particularly adapted is the triggering of flash tubes in electronic photo-flash equipment. Firing may be readily controlled by a manual trip-switch, by built-in shutter synchronizing switches, or by a phototube. The use of a phototube in combination with the OA5 permits simultaneous control of any number of flash units without the use of interconnecting cables. Moreover, the extremely low trigger current requirements eliminate the possibility of shock and reduce the sparking of the switch contacts to a negligible degree. Another use of the Sylvania Type OA5 is in the triggering of such tubes as the 1D21 which are used for stroboscopic work. The OA5 is also used in depth recorder circuits. These are uses in which the OA5 triggers off other types of tubes which either handle higher output powers, or need more power to trigger them off than is available in the source of the triggering impulse, or both. These applications exemplify the versatility and usefulness of the trigger tube.

There are many additional applications for this miniature relay tube wherever precision firing, low firing delay time, low triggering current, and relatively high anode operating potentials are important.

TYPICAL CIRCUITS

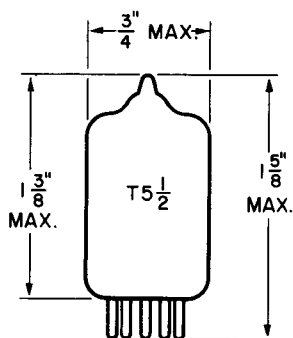
Typical circuits are shown in Figures 1, 2, and 3. The circuit of Figure 1 utilizes an external source for providing the trigger pulse voltage. In Figures 2 and 3 both the trigger grid bias and pulse voltages are derived from a bleeder across the power supply.

Figure 2 is a representative circuit for firing an externally triggered electroflash tube from a shutter synchronizing switch. In Figure 3 a photocell provides the triggering

pulse and permits synchronized control of a number of flash units.

It should be noted that the shield grid (G2, Pin No. 5) is left floating in all the circuits illustrated. The shield grid may be grounded to the cathode through a 10 megohm resistor to provide a considerable increase in hold-off voltage. However, this will also require that considerable higher trigger pulse voltages be provided, together with an appreciable increase in the grid pulse (or switch) current.

OUTLINE



SUGGESTED CIRCUIT VALUES

- R1 = 15 MEG
- R2 = 5.1 MEG
- R3 = 5.1 MEG
- R4 = 270 K
- R5 = 1 MEG
- R6 = 500 TO 1000 OHMS
- R7 = 1 TO 4 MEGS
- R8 = .47 MEGS
- R9 = .47 MEGS
- C3 = FLASH TUBE COND.
- C2 = .01 μ f
- C1 = .1 TO .25 μ f

The diagram illustrates a camera flash circuit. It features a main power supply E_{bb} connected to a resistor $R6$. A series of resistors $R9$, $R7$, and $R8$ are connected to the main supply. A switch S is connected to $R9$. A timing network consisting of resistors $R2$ and $R3$, and capacitors $C2$ and $C1$, is connected to the junction between $R7$ and $R8$. A vacuum tube, labeled 183 OA5, is connected to this network. The tube's filament is connected to a separate supply E_{cc3} . The tube's plate is connected to a transformer T , which is also connected to a capacitor $C3$. The transformer's secondary is connected to the trigger of an ELECTROFLASH TUBE.

FIGURE 3—PHOTOTUBE TRIPPING CIRCUIT

