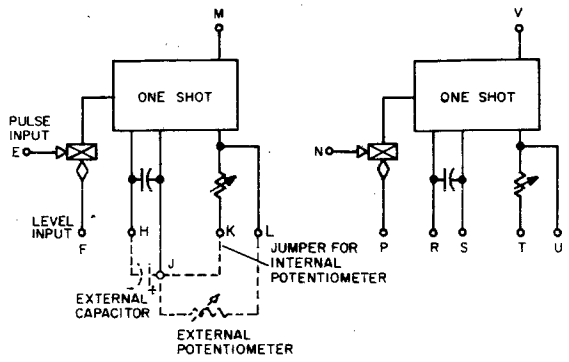
DELAY (ONE SHOT)
TYPE R302

R SERIES



R302 DELAY (ONE SHOT)

The R302 contains two delays (one-shot multivibrators) which are triggered by DCD gates. Each delay is independent and can be externally or internally controlled. When the input is triggered, the output changes from its normal ground level to −3v for a predetermined, adjustable period of time and then returns to ground. The length of the delay is determined by the capacitor and potentiometer. External capacitors can be attached between terminals H and J (or R and S), J (S) being the more positive terminal. The 20-kilohm internal potentiometer can be used by putting a jumper between terminals J and K (or S and T). External potentiometers can be attached between terminals J and L (S and U). The total resistance between these terminals must not exceed 20 kilohm. A 20% change in power supply voltage will change the delay less than 2%. Delay jitter due to power supply ripple is less than 0.2%.

The expected delay of any combination (with more than a 500-pf capacitance) can be estimated by the following formula:

$$\text{Delay} = RC$$

where the delay time is in nsec, R in kilohm and C in pf. The total capacitance, C, equals 220 pf of internal capacitance plus any external capacitance used. The resistance, R, is equal to the resistance of the potentiometer plus 1 kilohm of internal resistance. The minimum delay is 400 nsec. The minimum delay in nsec for a given external capacitor is C where C is equal to the external capacitance in pf plus a 220-pf internal capacitance. The recovery time is twice the minimum delay.

The delay range for typical capacitors used with the internal potentiometer is given in the table that follows:

DELAY RANGES

Total Capacitance Used (External + 220 pf Internal)	Minimum Delay Range	Recovery Time
Internal 220 pf only	400-4000 nsec	800 nsec
2000 pf	4-40 μsec	8 μsec
20 nf	40-400 μsec	80 μsec
200 nf	0.4-4 msec	0.8 msec
2000 nf	4-40 msec	8 msec
20 μf	40-400 msec	80 msec
200 μf	400-4000 msec	800 msec

R302 — $44.00

Large electrolytic capacitors can have internal leakage enough to substantially modify time delay. For best results, use wet-slug tantalum electrolytics for delays of several seconds or more. Four volt ratings are adequate in most cases, but 6 or 8 volt ratings may be desirable to further reduce leakage in some cases.

Remote Control Wiring: Noise picked up on wires leading to remote timing capacitors or rheostats tends to synchronize the end of the delay period (or it could cause false triggering in extreme cases). Even for 1 ft control wires, a grounded shield may be advisable if smooth control and freedom from jitter are essential.

INPUT: Level — Standard levels of —3v and ground. A DCD gate is enabled by ground level and disabled by a —3v level. The conditioning level must be present for at least 400 nsec before the gate is pulsed. The level input represents 2 ma of load at ground. **Pulse** — Standard 100-nsec pulses (—3v to ground). It can also be driven by positive-going level changes (—3v to ground) with rise times of 60 nsec max and duration of 100 nsec min. Prior to operation the input must have been at —3v for at least 400 nsec. The pulse input represents 3 ma of load at ground. The delay cannot be set from its output terminal.

OUTPUT: Standard Level of —3v for the duration of the delay time. The output can drive 18 ma of external load at ground. The internal load is 2 ma.

POWER: +10 v(A)/0.6 ma; —15 v(B)/88 ma.