



Electronics for Model Railroads

211 RocBaar Dr., Romeoville, IL 60446

(815) 886-9010 FAX: (815) 886-9076

TD-1

TIME DELAY CIRCUIT

GENERAL DESCRIPTION: The CIRCUITRON TD-1 is designed to connect to the output of any CIRCUITRON Detection Circuit (the DT-4 is the usual choice) and will provide a variable delay period which can be used to control accessories, to provide automatic train stops, etc. The output of the TD-1 is a single pole, double throw relay with 5 amp contacts. These contacts are adequate for controlling locomotives in *any* scale, and they can be used to either "make" a circuit connection for the time duration, or to "break" a circuit connection for the time duration. The TD-1 requires an 11-14 volt DC power source for proper operation. Although the power source does not need to be regulated, a filtered power source is preferred, and under no conditions should the input voltage exceed 15 volts. Since the accessory terminals of most power packs will have outputs in the 14-18 volt range, they are *not* a good choice for powering the TD-1. The Trigger Terminals [T1 & T2] on the TD-1 require a momentary or continuous connection to ground [-] to initiate the timing sequence. This connection can be supplied by CIRCUITRON Detection Unit outputs, reed switches, track contacts, pushbuttons, etc. Once the timing sequence has been started, further inputs to the Trigger Terminals will be ignored. Each of the two Trigger Terminals provided [T1 & T2] can be used interchangeably. The reason we have chosen to provide two separate terminals is so that closely spaced stopping points can be achieved. The ground signal [-] to a Trigger Terminal *must* turn off for a 4-5 second period before that Trigger Terminal will again respond to the ground signal. This is necessary to prevent unwanted triggering between cars if the Opto-Sensor becomes partially unshaded. When the TD-1 is used with a detection circuit such as a CIRCUITRON DT-4, the entire train must be clear of the Opto-Sensor for 4-5 seconds before retriggering can occur. By utilizing *both* Trigger Terminals, the TD-1 can be made to delay twice in quick succession, even before the train clears the first stopping point Opto-Sensor. If this is confusing to you, just remember to *alternate* your detector connections to *both* [T1] and [T2] if you desire closely spaced stopping points.

INSTRUCTIONS: The CIRCUITRON Time Delay Circuit can be connected with .110" solderless connectors or by soldering leads directly to the terminals on the printed circuit board. If soldering, use a small pencil-type iron and electronics-grade, rosin core 60/40 solder (available at Radio Shack). Use only as much heat as necessary to obtain a good joint and do not wiggle the terminal until the solder has cooled completely.

- 1) Mount the TD-1 in a convenient location. The mounting pads in the corners of the circuit board may be drilled out, or use a section of CIRCUITRON's Printed Circuit Mounting Track [PCMT] for the simplest installation.
- 2) Connect your controlled device (accessory, isolated track section, etc.) to the relay terminals labelled [1], [2] and [3]. If you are using the relay to turn power *ON* to a device, you will use terminals [1] and [2]. If you are using the relay to turn power *OFF* to a device (such as for a station stop), you will use terminals [2] and [3]. If the TD-1 is being used for a station stop, you will have to isolate one rail on either side of your stopping point by using insulated rail joiners or by cutting gaps in the rails. Refer to *Figure 1*. If your track does not have multiple feeders to the rails, remember to connect a jumper wire *around* the isolated section.
- 3) Connect a trigger source such as the CIRCUITRON DT-4 to [T1]. If you are using a mechanical pushbutton or reed switch, the other side of the switch must connect to the negative power input terminal (ground), [-]. Refer to *Figure 3*. If more than one trigger delay point is desired, alternate the connections between [T1] and [T2]. You may end up with more than one triggering source connected to each of the Trigger Terminals, but no two

consecutive trigger points should be connected to the same Trigger Terminal.

- 4) Connect the power supply terminals labelled [+] and [-] to a source of 11-14 volts DC.
- 5) Rotate the Delay Control [P1] fully *counter-clockwise*. This will set the minimum time delay.
- 6) Run a train past the selected trigger points and check for proper operation. You should be able to hear the relay click in and out.
- 7) Adjust the Delay Control [P1] to achieve the desired time delay period.

Figure 1: Automatic Station Stop and Delay with Slowdown and Slow Start.

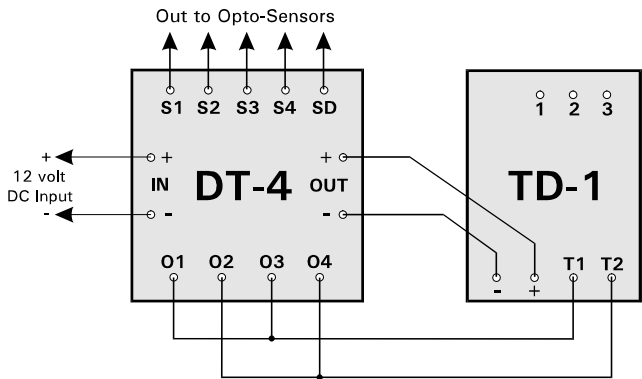
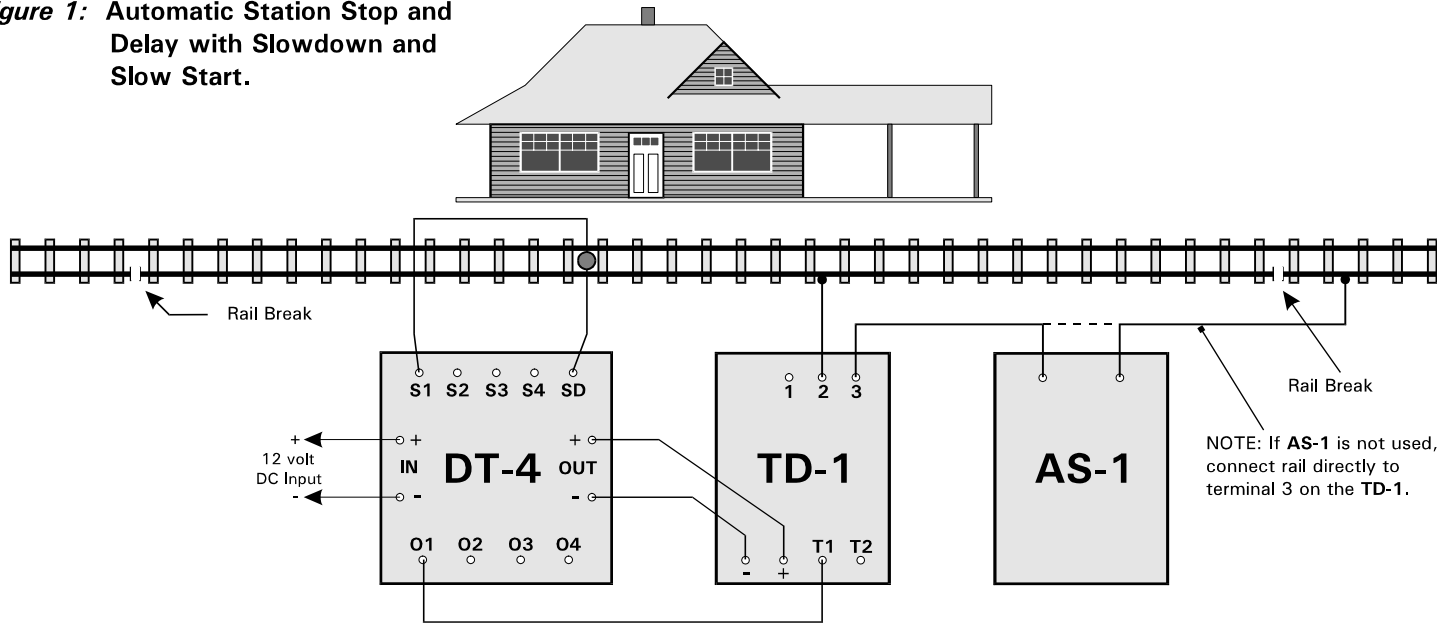


Figure 2: Using Both Trigger Terminals for Closely Spaced Stopping Points.

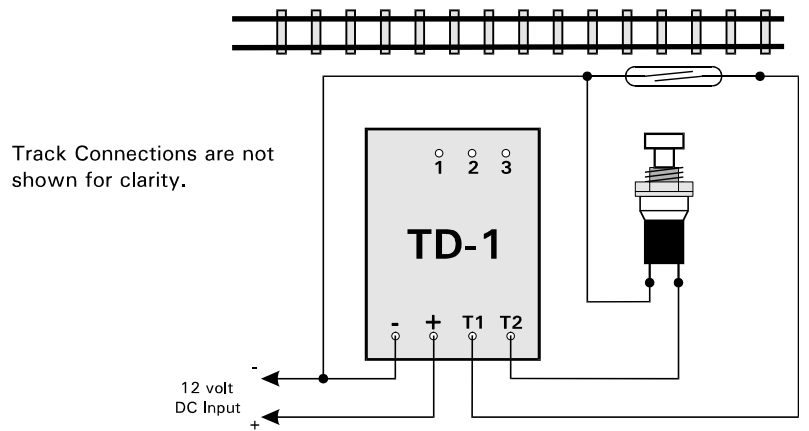


Figure 3: Using a Reed Switch or Pushbutton for Triggering .

WARRANTY

CIRCUITRON warrants this device against defects in materials and workmanship for a period of one year from the date of purchase. This warranty covers all defects incurred in normal use of the device and does not apply in the following cases:

- a) damage to the device resulting from abuse, mishandling, accident or failure to follow operating instructions.
- b) if the device has been serviced or modified by other than the CIRCUITRON factory.

EXCEPT AS MENTIONED ABOVE, NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED INCLUDING MERCHANTABILITY, ON THE PART OF THE UNDERSIGNED OR ANY OTHER PERSON, FIRM OR CORPORATION, APPLIES TO THIS DEVICE.