

An Automatic STOP and GO Circuit for DC Operation

from modeltrainsounds.com

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With this small inexpensive circuit board you can set up a small single track oval or circle layout that runs automatically with an adjustable stop time. This setup is most commonly used to simulate a station stop. After a pause the train continues to repeat the process.

The components needed to complete this project, in addition to the track and a 12-14 volt train controller transformer include the following:

1. The Automatic STOP and GO Relay Circuit Board
2. A Reed Switch that is activated by a magnet.
3. A Neodymium Magnet that is attached to the train.
4. Connection wires for the track, relay module and reed switch.
5. A piece of track that is modified to accommodate the circuit. (**Option 1**)

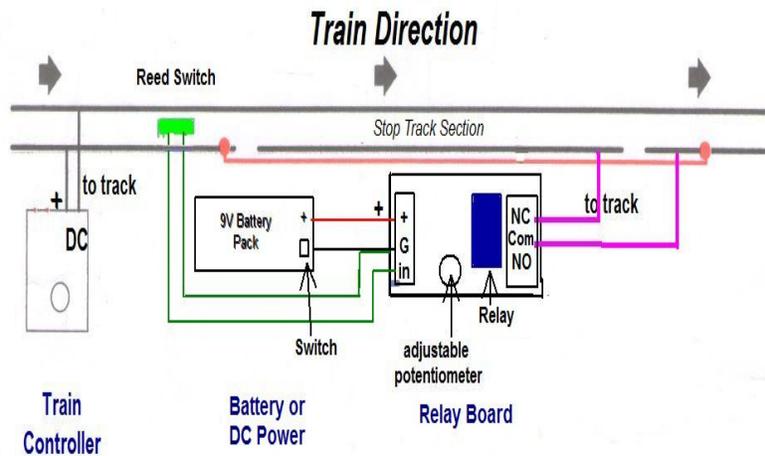
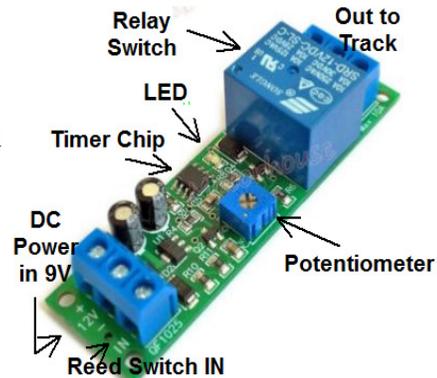
The Automatic STOP GO Circuit Board

components include

1. Connection plugs for the 9-12VDC power source, and for the Reed Switch wires at one end of the board and for Track connection wires at the other end.
2. A Relay Switch to turn power on and off to the track.
3. A Timer chip for the stop time delay
4. A Potentiometer to set the stop time on the chip
5. An LED that turns ON during delay time.

The STOP & GO board is powered by a 9-12 Volt

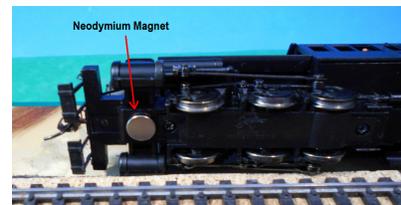
DC power source from a 9 Volt Battery with switch or other 9 Volt DC Power source.



SETUP OPTION 1 (using a STOP TRACK)

1. The variable DC output from the train controller is attached to the track and controls the train speed. Set the Positive wire to the track on the right side when the train is moving forward.

2. The Reed Switch is set in the track before the stopping point. This switch is activated by the neodymium magnet that is placed on the undercarriage of the locomotive. Usually it is attached to a screw or other metal part under the locomotive. The reed switch activates the relay which



turns power off to the isolated section of the Stop Track. The wires from the switch attach to the trigger IN location on the board and to the GND plug on the board as shown.

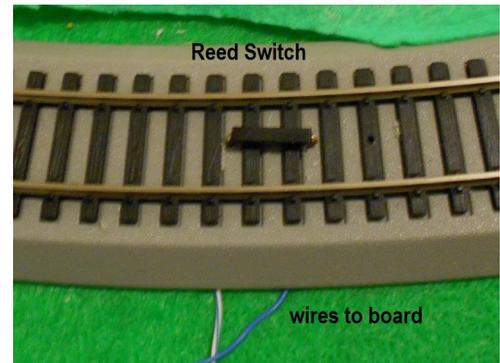
3. The relay is connected to the stop track, NC (Normally Closed) port, and to the track beyond the stop track COM (common) port. No connection is made to the NO (normally Open) port.

Once the locomotive's electrical pickup crosses into this section of track the locomotive will stop. The Timer chip, activated by the Reed Switch will delay for a period of time that is set by the adjustable potentiometer. Turning the Pot clockwise increases the stopping time. When the stop time expires the relay is turned off repowering the stop track. Stop track and the train resumes forward motion. This system can be setup typically at a Train Station to simulate a train stopping for passengers.

In setting up this circuit you need to consider the following.

Where to locate the activating Reed Switch Generally this is set just before the train crosses into the isolation track. In HO scale this is around 12-24 inches from the first gap in the Stop Track.

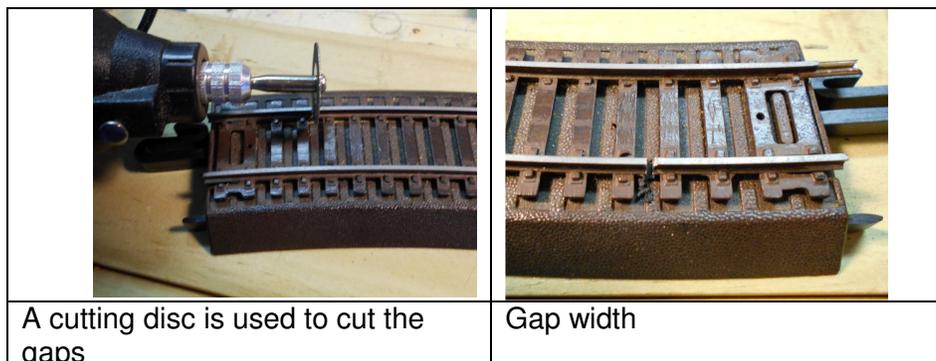
The two ends of the Reed switch are soldered to the connection wires. The wires are fed through the track between the ties so that the body of the switch can be laid parallel to the track rails. The wires run under the rails and are connected to the terminals on the circuit board as indicated.



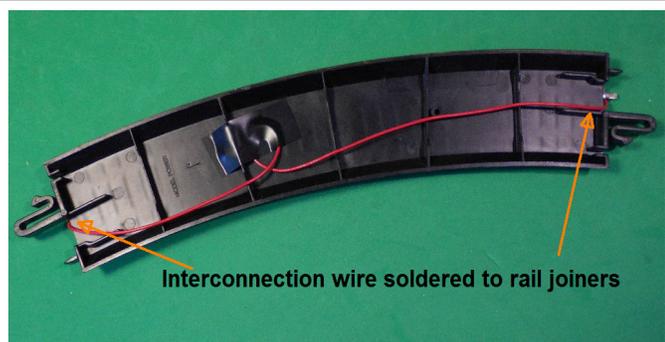
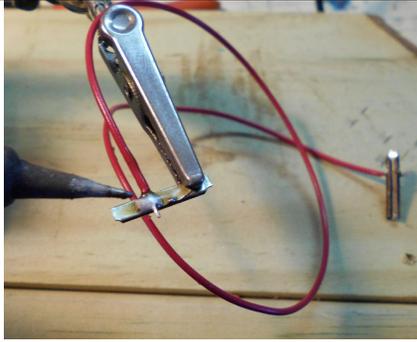
Where to locate the isolation Stop Track This should be setup so that when the train stops most or all of the passenger cars can access the station's platform. This point will generally put the isolated part of the track at the far end of the station or just beyond .



How to build the Stop Track As the diagram below indicates 2 break gaps are needed in the track. The gap between these breaks will depend on the length of the locomotive's electric pickup wheels on that side of the track. Select a piece of track. Use 2 track plastic insulators or cut the gaps using a fine hacksaw or Dremal type cutting disc to isolate the track. The cut should be just wide enough to break the electrical contact.



Feeder wires are soldered on either side of the furthest track gap and connected to the circuit board. An interconnecting wire is prepared by soldering the wires directly to the track beyond both gaps or solder the wire ends to two rail joiners. The joiners are attached to the ends of the track that contains the gaps. The Stop track is now installed on the layout.



Solder wire to rail joiners at the ends

Connect and hide the wire connecting both joiners

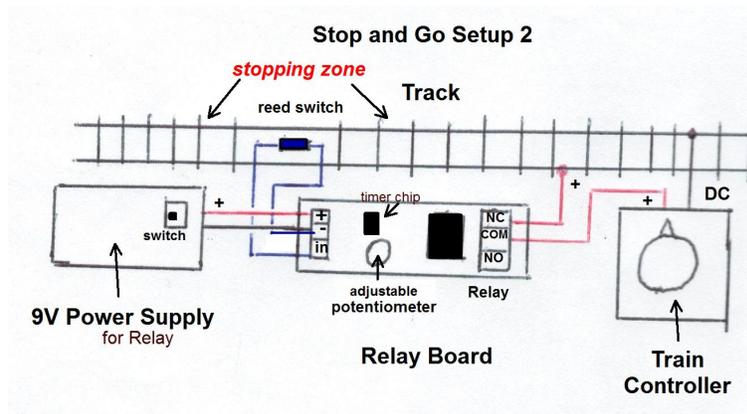
Connect the wires from the 9 Volt power source. The positive wire is attached to the VCC terminal, the negative wire is attached to the GND port. A switch on the battery pack is used to turn power on and off. If a plug-in power unit is used a switch can be inserted on one of the wires to turn power on and off.

The unit is now ready for testing. When power is applied nothing will happen until a locomotive with the magnet attached passes over the reed switch. The red LED on the board will light and an audible click will sound. The locomotive will stop on the Stop track and wait for the timer chip to count down. You can adjust the time delay by turning the potentiometer dial using a small flat blade screwdriver. Turn clockwise to increase the delay and counterclockwise to shorten. Once the delay has elapsed the red LED turns off, the track is switched on and the train proceeds forward.

SETUP OPTION 2 (Turn off all Track Power)

This alternative can be used for simple track layouts such as an oval or circle or block section where the entire power supply can be turned off by the relay switch. In this case one of the track power supply wires is directed through the relay so that when the relay is activated by the reed switch power is switched off to the track. The reed switch is positioned at the stop point as the loco will stop when it crosses the magnet.

The Advantages of this option are that it works in both directions, there is no need for the stop track and no soldering involved. If using a block set up only the power to the block is turned off.



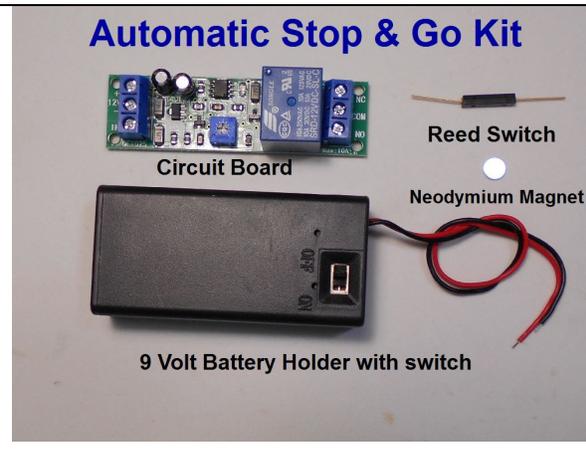
A kit containing the necessary components required to complete this project is available at the website

modeltrainsounds.com (Project 17)

The kit components include

- 1x Stop & GO Circuit Board.
- 1x Reed switch + 1 Slide switch
- 2x Neodymium magnets
- A 9 Volt Battery Pack
- Instructions for installation

Soldering may be required for wiring the stop track.



Accessories for the Stop and Go Circuit

Several accessories are available at the website modeltrainsounds.com to enhance this product. See the **Order page under Project 17**

1. DC Adapter plug for using a wall plug in Power Source.

Instead of using a 9 Volt battery to power the automatic reversing module you can use a plug in wall adapter rated for 9 to 12 Volts DC current output. We recommend a 9 Volt unit . In order to use the power pack an adapter plug is required to interface the unit to the power unit. This adapter plug has a receptacle that accepts the 5.5 x 2.1mm plug on most of these plug in units. The screw down terminals allow wires to connect to the auto reversing unit for DC input .



2. 12 VOLT AC to 9 Volt DC Power Converter.

This 12V AC to 9 V DC converter allows for the use of many older toy train controllers that have a 12 Volt alternating current (AC) source usually used for accessories. This AC voltage source is variable, around 12 VAC but can be converted to a stable direct current (DC) using this converter module that provides a regulated constant 9 Volt DC for powering the automatic reversing nodule.



3. POWER UNITS

A number of older train controllers are available that can be used as a dedicated power source for this project. Examples are shown here. These controllers have a variable direct current (DC) that can be used to set the train speed and an 12 Volt AC source that can be used to power the relay board **when** the 12V AC to 9 V DC converter (Item 2) is used . These units are not listed for sale at modeltrainsounds.com. However we occasionally find some and list them at the R and B Store on ebay.



4. Neodymium Magnets

These 6mm diameter are 1 mm in thickness. They will tightly adhere to any metal surface on the undercarriage of a locomotive or rollingstock. Available in packs of 5