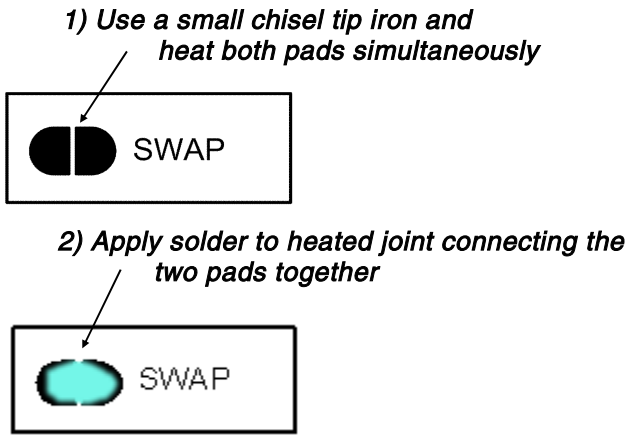
Switch Machine Reference Guide - Part 4 - Options

4.0 Switch Machine Options

The following options are available and modify the operation of the switch machine as described below. Each option is enabled by connecting the indicated pads together with a solder jumper. To install a jumper and enable the option follow the steps shown in the diagram. Use only the minimum amount of solder required to make the connection. Only electronic grade rosin core solder should be used. If it is desired to disable the option at a later date, the solder jumper can be removed by reheating the joint and wicking the solder away with solder braid, fine stranded wire, or by using a solder suction device.



4.1 Lock Enable Option

Often it is desired to be able to disable operation of the switch machine from the local fascia controls. This is typically done in CTC controlled territory so that a dispatcher can prevent operation of a main line switch for example. Alternately, you may wish to install a key switch at the turnout location, requiring the crew to use a switch key to activate the turnout.

Lock mode converts the POS IN pin to function as a LOCK on/off input. When on (POS IN pin is low, or connected to COM with a switch), the switch machine will not respond to fascia controls or DCC commands. When off (pin is open, or logic high), the fascia indicators will flash indicating the turnout is unlocked, and fascia controls and DCC commands will operate normally.

4.2 Color Mode Option

The behavior of the LEDs on the standard fascia controllers can be modified by installing one or both of the Color Mode jumpers. Four modes are available as shown in the chart. Alternate color is the manufactured default. Installing the GRN or YEL jumper will cause the switch machine to use the respective color for both switch positions. When both jumpers are installed, both indicators will always be illuminated, and the color positions will reverse when the switch machine reverses position.

Color mode affects only bi-color LEDs on the standard fascia control connector. Indicators on the auxiliary control connector are not affected by the color mode selected.

When using the single LED 942-123 Accessory Controller for switch machine control, the LED will illuminate for both switch positions when Bi-Color Mode is selected.

The chart illustrates all possible indications using the 942-121 Fascia Controller depending on switch machine position and connector orientation used for the connection to the fascia controller. Reversing the connection allows any color to appear in either location as required by the control panel layout.

	PLUG NORMAL		PLUG REVERSED	
MODE	NORM	REV	NORM	REV
ALTERNATE (GRN OFF) (YEL OFF)				
GREEN (GRN ON) (YEL OFF)				
YELLOW (GRN OFF) (YEL ON)				
BI-COLOR (GRN ON) (YEL ON)				

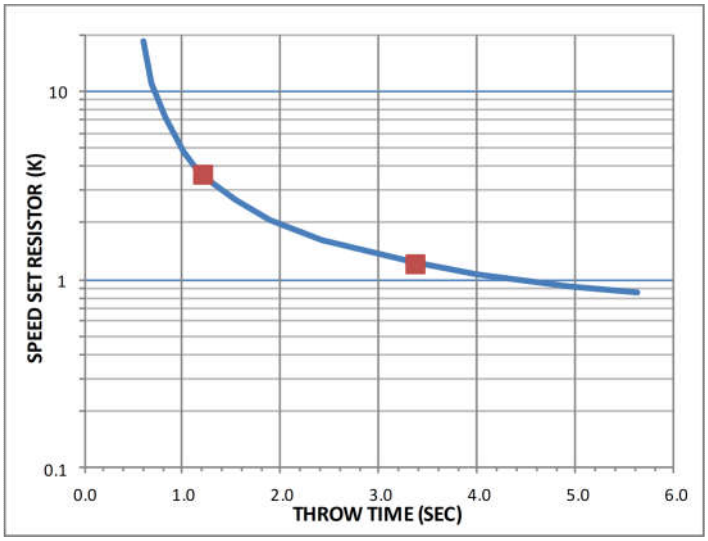
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4.3 Variable Speed Option

The speed the switch machine takes to traverse to the opposite position can be modified with this option. The default speed is about 1 sec, and with the jumper installed, about 3 seconds.

If desired, a resistor may be installed in lieu of the jumper to set the speed to any value from .5 sec to 5 sec as shown on the graph.

The chart shows the relationship between resistor values and throw time. Pick a 1/8 or 1/4 watt resistor with a standard value between 900 and 18000 ohms corresponding to the desired time. Resistor values beyond this range will cause the switch machine to revert to a jumper selected time rather than that shown on the chart. The indicators on the chart show resistor values which will produce times equivalent to the two jumper selected times.



4.4 Swap Option

Swap can be used to reverse the physical orientation of the switch machine wire actuator. With the option jumper installed, Norm will be to the left rather than to the right as shown on the first page diagram.

Since the indicated position can be changed by reversing the cable connection to the fascia controller, this option is generally not needed unless DCC or logic controls are used simultaneously with fascia pushbuttons. Since the switch machine orientation which corresponds to the desired 'Normal' can be either position, Swap can be used to correct the external remote commands so that 'Normal' to the DCC command is the same as the indicated 'Normal' on the fascia indicators.

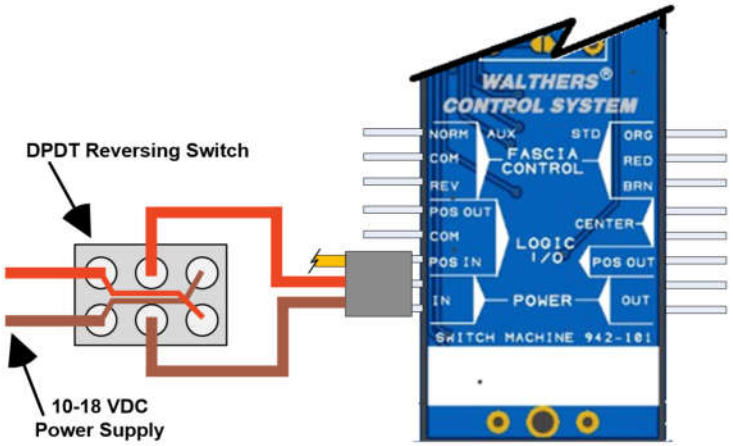
This option may also be useful in a crossover configuration where one of switch machines is not in the same orientation relative to the turnout as the other.

4.5 Polarity Route Option

Polarity Route is used to allow the switch machine position to be set by the polarity of the applied DC supply voltage. Control via fascia switches and logic inputs is disabled when this option is used however LED indicators will function normally. This mode allows the switch machine to either replace a conventional stall motor machine when filtered DC power is used, or be used with the same control panel hardware when added to an existing installation.

When the option is selected, connect the switch machine DC power through a DPDT reversing switch as shown. The throw time of the switch must be less than 50 msec to avoid resetting the control electronics.

If replacing an existing stall motor machine, remove any in-line LEDs in the power circuit and rewire to the fascia control pins as shown in Part 7. Alternately, you can connect LEDs with appropriate current setting resistors across the power input between the DPDT switch and the switch machine. When running, the current load of the switch machine may damage standard control panel LEDs wired in series with the input power circuit.



4.6 Center / Learn Mode

When installing a switch machine on the layout, it is helpful to have the turnout actuator wire in the center of throw, then fasten to the benchwork with the turnout throw bar in its center position. As delivered, the switch machine is in its center position, and a jumper plug is installed as shown. The center jumper must be removed for normal machine operation.

Center / Learn Mode can be entered in one of two ways:

1) Install the jumper plug on the Center pins as shown. You may do this with power applied. The servo will rotate to the center position and the fascia indicator LEDs will begin alternately flashing. When done, remove the jumper, and normal operation will be restored.
2) Remove power. With the Standard Fascia Controller connected, push and hold the button and apply power. Continue to hold the button until the servo moves to the center position. When the button is released, the LED indicators will flash alternately. The switch machine will remain in the Center / Learn mode until power is removed.

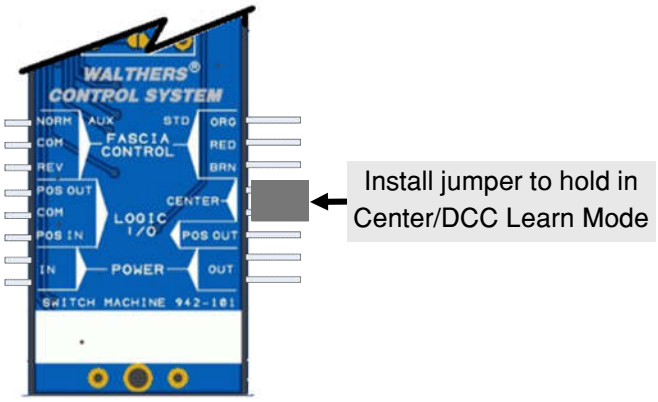


Fig 4.6 Center Program Jumper

4.7 Setting DCC Control Address

The switch machine includes the ability to respond to accessory decoder commands when connected to DCC power. As shipped, the DCC function is disabled. To enable operation via DCC, follow the steps below to set the address you wish to use for turnout control.

Note that while the switch machine can be operated with DCC accessory decoder on/off (sometimes called thrown/closed) commands, it is not itself a decoder, has no DCC address and has no CVs to program.

If you wish to use accessory decoder commands to operate the turnout, follow the steps below to set an address and enable DCC operation. Using DCC to control the turnout requires using DCC booster output for power. Do not use a program track to operate the switch machine.

The DCC address can be set, changed or cleared at any time before, during, or after installation on the layout.

Follow these steps to set or clear a DCC address:

1) Enter Center / Learn Mode using one of the two methods described in Section 4.6.
2) Issue an accessory decoder 'on' or 'thrown' command using the address you wish to use for the turnout.
3) The switch machine will jog toward the REV position acknowledging the stored address.
4) Issuing an 'off' or 'closed' command using any address will clear the current address and disable DCC control. The switch machine will acknowledge the reset by a jog toward the NORM position.

If you simply wish to change the address it is not necessary to clear the old address before setting the new one.

If you activate the Center / Learn Mode while the switch machine is on the layout and DCC power is applied, make certain the only accessory decoder commands issued are the ones you wish to use for the turnout.

If you remove power while the switch machine is in Center / Learn Mode, when power is re-applied, the switch machine will remain at the center location until a fascia button is pushed or a DCC, switch or logic command is received.