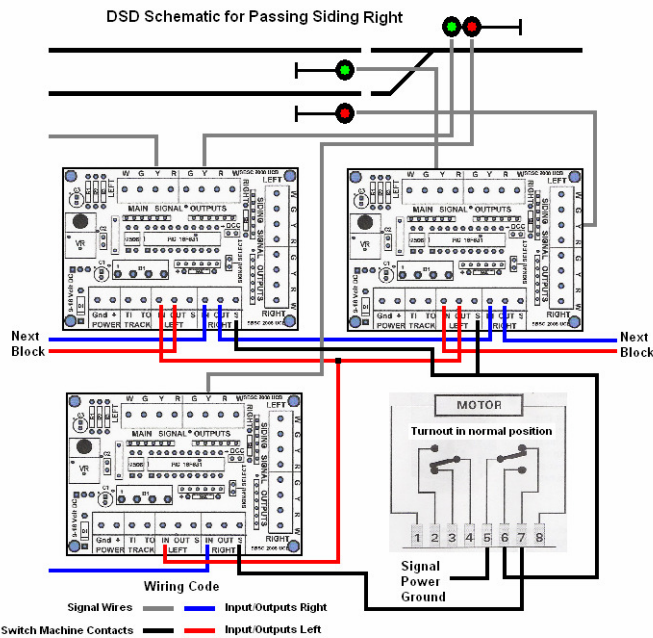
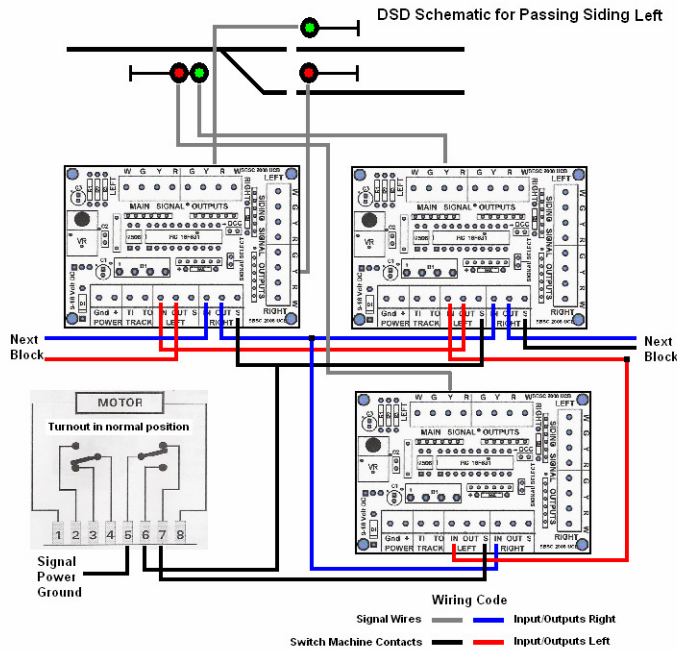


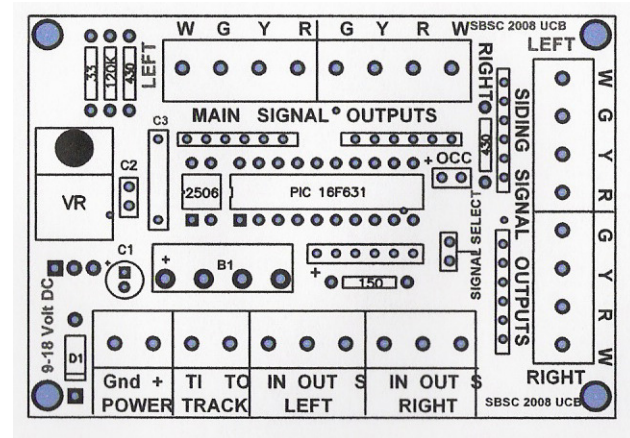
[5] The following is a wiring diagram for wiring a siding using DSDS and Signals.



**South Bend Signal Company**  
"Making Your Railroad Real"

**Detector Signal Driver (DSD)**

[www.sbsignal.com](http://www.sbsignal.com)

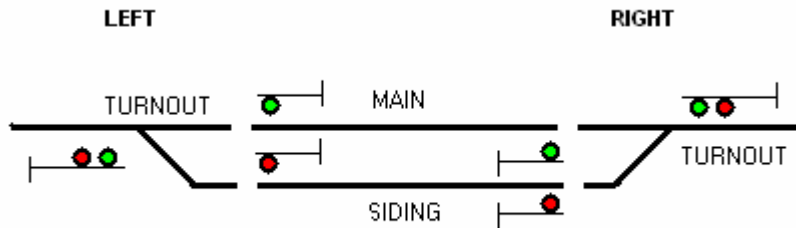


**Users Manual v4**

SBSC © 2008

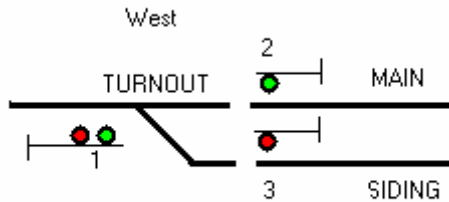
There are four parts to this passing siding. The top track is designated as **MAIN**. The lower track is designated as the **SIDING** (diverging route). There is a turnout at each end of the track (East and West). Adding signals to protect the MAIN, SIDING, and TURNOUTS looks like this

Fig.17



There are a total of 6 signals to protect the passing siding: two double target signals and four single target signals. The double target signals face the entrance to the passing siding at the LEFT and RIGHT turnouts. The four single target signals face toward the next block LEFT and RIGHT. Turnout positions at either end of the siding will affect the signal aspects. For our purposes, let's look at one end of the passing siding.

Fig.18



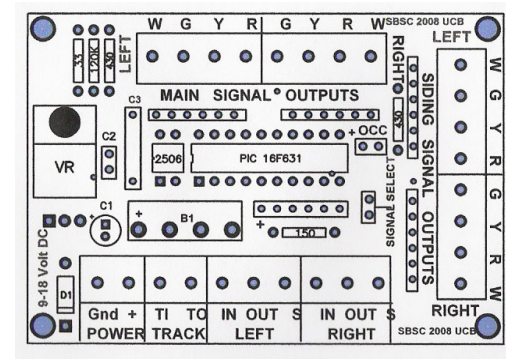
If the turnout is normal (straight) and the main is clear, then signal (1) will display green over red. If the next block WEST is clear, then signal (2) will display green and signal (3) will display red. Signal 3 blocks the train from entering the main because the turnout is normal. If the main is occupied between the turnouts, the signal (1) will be red over red.

If the turnout is reversed (thrown) and the **SIDING** is clear, then Signal (1) will display red over green. Signal (2) will be red, and signal (3) green if the next block to the LEFT is clear. If the siding is occupied, then signal (1) will be red over red.

Thank you for purchasing South Bend Signal Company's **Detector /Signal Driver (DSD)**. This product will provide you with added realism and enjoyment for your model railroad.

The DSD has the following features:

- It is compatible with DC or DCC systems.
- It has a maximum 4 amp track power output capacity.
- It will provide detection and signal driving for one block of track.
- It is bi-directional providing detection and signaling on single-track mains in both directions.
- It drives LED type signals. (Search Light: three-wire, and Color light-common anode). **It will not drive two wire bi-color LED**
- It can control either search light or color light type signals.
- Current limiting resistors for signals are installed.
- Uses a separate 12 - 18v DC power supply for operation.



**Pin out Description:**

**Search Light Signals- G Y R G Y R: (Main and Siding)** -The terminals to connect search light signals for the LEFT and RIGHT end of a block.

**D-Type Signals- W G Y R G Y R W: (Main and Siding-** The terminals to connect color light signals (W is for the common (+) lead for each signal.

**Input and Output Terminals**

- **Gnd:** Ground connection from signal power supply
- **+**: power (positive) connection from signal power supply
- **TI:** Input from power pack
- **TO:** Connection to track
- **IN:** **LEFT and RIGHT** Input from next **LEFT and RIGHT** DSD
- **Out:** **LEFT and RIGHT** Output to next **LEFT and RIGHT** DSD
- **S:** **LEFT and RIGHT** Input from switch machine **LEFT and RIGHT**

## To connect the signals to the DSD do the following:

[1] Run phone wire from the DSD to the signal. You only need three wires for searchlight signals (G/Y/R) and four wires for color light signals (G/Y/R/W). You will have one set from the LEFT signal and one set from the Right signal. Most phone wire today has six wires with an insulating cover. They are insulated with red, green, yellow, blue, white, and black insulation. The colors of the wires on South Bend signals are connected to LEDs with the same color wire as the color of the LED, which makes installation easy. Match the color of the wire with the leads from the LED and at the DSD end connect the same color to the labeled color on the terminals. You should install a strain relief to the wires by the signal as well as by the DSD. You also may want to label these wires at both ends for future reference. You may also want to give the signal a number and glue it to the number board on the signal. You can mark this same number on your track diagram for future reference.

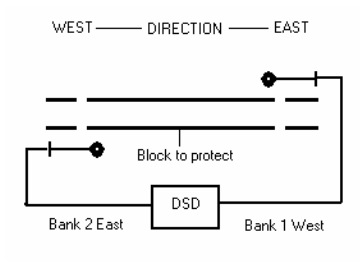


Fig.13

## Testing the Signal Installation

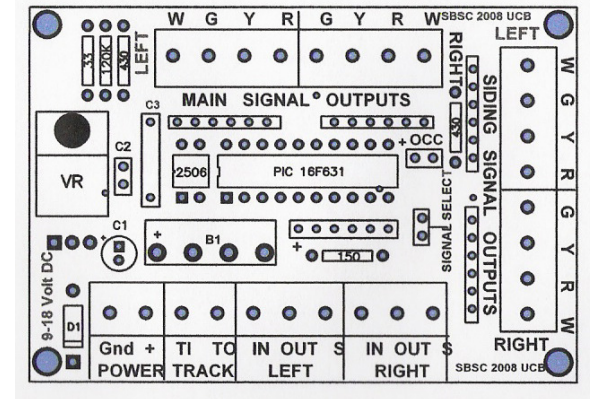
Now it is time to test the system. Turn the track power on. Turn the power to the DSD on. Check both signals. You should have a green light at each signal. Place a locomotive in the block. If everything is connected correctly, then you should have a red at each signal. Congratulations! You have successfully installed the South Bend Signal Company DSD Signal System. If it is not working correctly, then recheck your wiring and try again.

## Connecting DSDs Together

Once you have connected one DSD to a block, the next task is to connect multiple DSDs together. To connect DSDs together, you connect the output terminal **OUT (LEFT)** to input terminal **IN (LEFT)** of the next DSD to the **LEFT**. Connect the output terminal **OUT (RIGHT)** to input terminal **IN (RIGHT)** of the next DSD to the **RIGHT**.

[1] The DSD should be installed under your layout. The DSDs can be grouped together in one location or can be placed out on the layout within the block to which it will be attached. There are advantages to each arrangement. Grouping them together allows for short wire connections between DSDs, but makes for longer signal wire lengths. Placing the DSDs out in each block location makes for longer connections between DSDs but shorter signal wire connections. You will have to decide which one is best for your layout.

DSD Board Fig. 3



Mount the DSD using #4 1/2" wood screws, placing the screws in the holes provided in the DSD. Use standoffs between the board and the mounting surface. Plastic/metal tubing about 3/16" diameter can be used for the standoffs. The standoffs keep the board off the mounting surface.

[2] Locate the **Input and Output** terminal strip on the DSD.

There are 10 terminals:

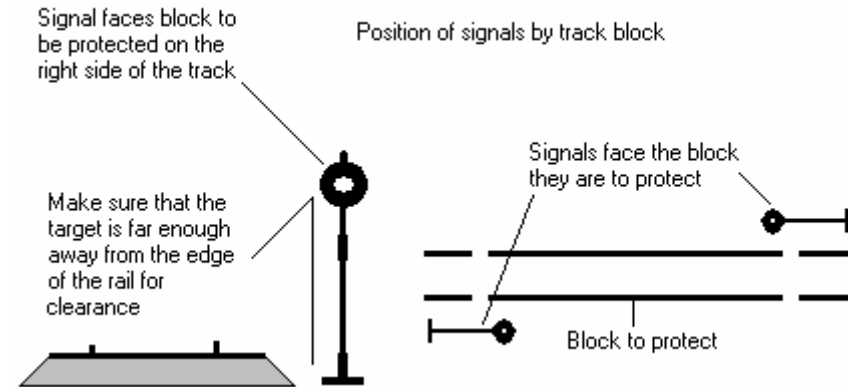
Fig. 4



- **GND:** Ground connect from a separate 12v DC power supply
- **+** : The positive connect from a separate 12v DC power supply
- **TI** : The track input terminal from the track power supply
- **TO** : The track output terminal which goes to the track
- **IN OUT S LEFT** and **RIGHT** will be connected later.

To install the signal, drill a hole next to the track just before the beginning of the block. This hole should be big enough to insert the signal base. Insert the signal into the hole so the target faces away from the block that you want to protect. It should be located on the right side of the track. This sounds confusing but I think that a diagram will help.

**Fig. 10**



Make sure that the signal is far enough away from the track. Place a car on the track where you want to install the signal to test for clearance.

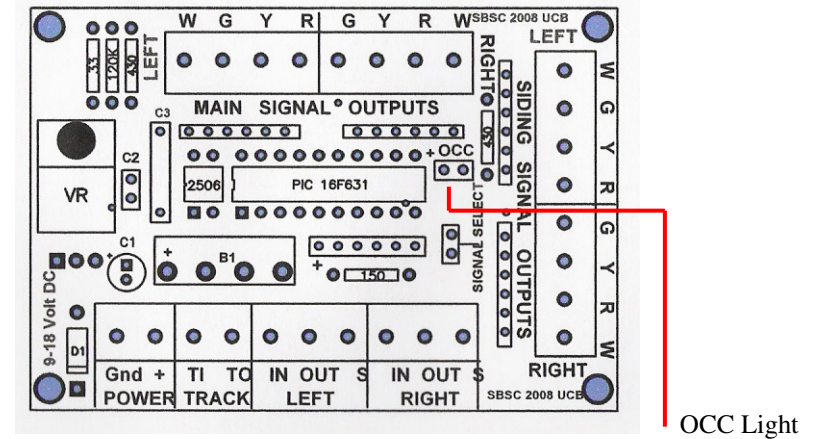
On a single track main you need two signals, one at each end of the block. On a double track main you need one signal facing the direction of travel for each track. You need to repeat the installation for each block on your layout. You don't have to protect your entire layout. Many railroads have signal sections and "dark" territories. Start small on your layout and work up to more blocks protected as your confidence increases.

After the signal has had time to set up, the next task is to connect the signals to the DSD.

Turn on the DSD power supply. Turn on the track power supply. Place a locomotive on the track in the block. The block occupied indicator light should be red. When you remove the locomotive from the block, the block occupied indicator should go off. If this test worked properly, then the DSD for this block is working properly. You have just completed the installation of the DSD to your track. You now have this block detected! If the occupancy indicator did not turn on, then go back and check your wiring and try it again.

Notice that when the engine is removed from the track that the indicator light does not go off right away.

**Fig. 7**



This is because there is a 1-second delay before the DSD determines the block to be clear. This prevents intermittent wheel contact and having flicker from the signal. Keep your track clean for the best operation of the DSD.

To install other DSDS to your track, repeat the steps followed in this section. The next step is to locate and install the signals on your layout for the blocks attached to the DSD.