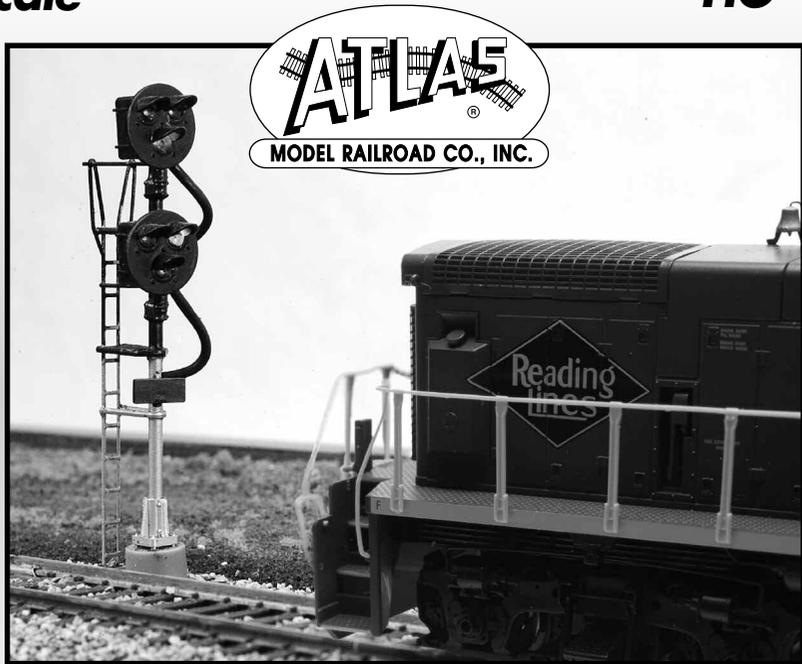


'N' Scale

'HO' Scale



***Atlas Model RR Signal System
Operating Manual***

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NOTE: EACH SIGNAL TARGET REQUIRES ITS OWN SIGNAL CONTROL BOARD AND ITS OWN BLOCK DETECTOR BOARD.



N Scale HO Scale

SINGLE TARGET

The Single Target is most commonly used on a main line. It is common to see two Single Targets facing opposite directions.

For modelers who have their layouts already functioning with a transformer, all that is needed to get started is the Single Target, a Block Detector Board, a Signal Control Board, and wiring.

BI-DIRECTIONAL TARGET

The Bi-Directional Target is commonly used on a single track main line, just like the Single Target above. Instead of two Single Targets, some railroads use a Bi-Directional Signal.

For modelers who have a functioning layout with a transformer, all that is needed to get started is the Bi-Directional Target, 2 Block Detector Boards, 2 Signal Control Boards, and wiring.



N Scale HO Scale

NOTE: EACH SIGNAL TARGET REQUIRES ITS OWN SIGNAL CONTROL BOARD AND ITS OWN BLOCK DETECTOR BOARD.



N Scale

HO Scale

DOUBLE TARGET

The Double Target is commonly located at an interlocking. An interlocking is the beginning of, or an entrance into, a switch (i.e. passing siding). This is also known as a "diverging route". The top target controls the main line and the bottom target controls the diverging route.

For modelers who have a functioning layout with a transformer, all that is needed to get started is the Double Target, 2 Block Detector Boards, 2 Signal Control Boards, and wiring. The Custom Signals, Inc. Turnout Signal Controller may also be desired with this type of operation. (Please visit www.customsignals.com for more information)

A. INTRODUCTION

Prototype signal systems are one of the most familiar trackside details to be incorporated on miniature rail systems. Ever since modern position light signals were introduced by railroads in the mid-1920's, model train manufacturers have been eager to offer them as the quintessential layout accessory. While capturing the appearance of the real thing, operation, in most cases, has been far less than prototypical...until now.

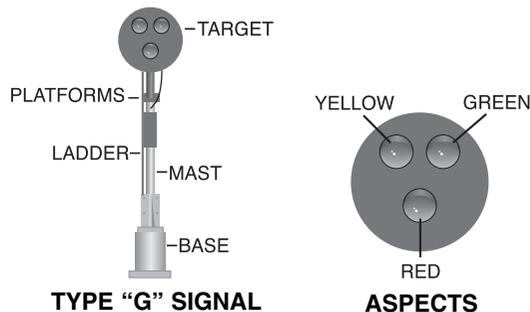
The Atlas Model RR Signal System represents a quantum leap in model signal operation and design. By following the simple installation instructions, the realistic signal structures will provide you with prototypical operation that can be tailored to any layout. The Signal Control Board (SCB) is the "heart" of the system. The Signal Control Board (SCB) is capable of three operating options:

- **Stand-Alone Signal Operation** - Each signal is completely independent and gives a Red-Yellow-Green aspect operation. The yellow aspect is timed for eight seconds. The signal turns red when a train enters the block.
- **Integrated Operation** - Each signal is connected together and the Red-Yellow-Green aspects are controlled by the blocks and signals in front of and behind your train. Hook-up between signals is accomplished easily with Atlas Model Signal Cables (Items #230-232), pre-packaged in lengths of 7', 15' and 25'.
- **Approach-Only Signal Operation** - On some prototype railroads, signals are off until a train approaches. The Atlas Model RR Signal System has the provisions to duplicate this operation.

Complex Signaling (in conjunction with the Turnout Signal Controller offered by Custom Signals, Inc.) - The Atlas Model RR Signal System has been designed to be fully compatible with the products offered by Custom Signals, Inc., one of the hobby's premier custom signal builders.

This manual reflects both HO and N Scale Track and Signals. Please note that the HO Scale Signal Control Board (HO #234) is different from the N Scale Signal Control Board (N #2234). The analog Block Detector Board (BDB) is for both HO and N scale (#233).

As you can see by the features included with Atlas Model RR Signal System, expert knowledge of the prototype was essential. Many hours and intense research were put into the design of the system to achieve prototype operation in a user-friendly manner. The following individuals have assisted with this project from concept to product realization: Gary Emmich, Steve Horvath and Terry Christopher.



NOTE: The aspects are in the same locations on all Type "G" Targets

B. SIGNAL CONTROL BOARD (SCB)

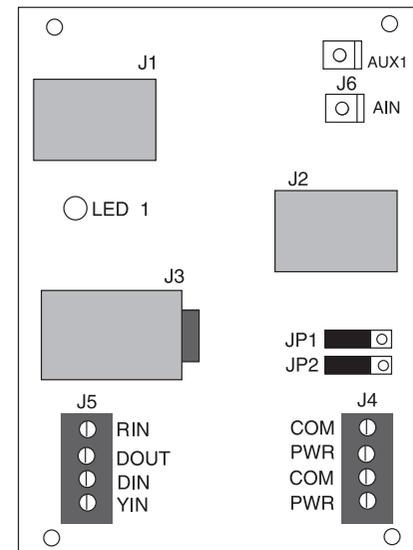
The Signal Control Board (SCB) is the "electronic brain" behind the operation of the signal system. By taking a few minutes to study the diagram and read the definitions, you will familiarize yourself with the overall operation of the signal system.

SIGNAL CONTROL BOARD (SCB) TIPS

When handling the Signal Control Board (SCB), it is important to follow these simple guidelines to prevent any damage to the control board.

1. Unplug your power source before attempting to handle the SCB.
2. Touch some type of metal surface. This action helps protect the SCB from any damage that could be caused by electrostatic discharge.
3. To avoid generating static electricity, do not walk around the room until you have completed handling or mounting the SCB.
4. Hold the board by its corners, taking care not to touch the components on the SCB.
5. Turn off your power supply after every operating session.

SIGNAL CONTROL BOARD (SCB)



DEFINITIONS

1. **J1- (Jack 1)** - J1 is used for multiple integrated installations only. In integrated installations, J1 is plugged into J2 of the following board. Atlas carries a variety of modular connectors in 7', 15', and 25' lengths, (Item #'s 230-232). See page 13 for further explanation of integrated installation.
2. **J2- (Jack 2)** - See J1 above.
3. **J3- (Jack 3)** - J3 is the connection for the 6 pin modular jack from the signal itself.
4. **J4- (Jack 4)** - J4 is a screw-type power connection terminal strip. It allows stand-alone or daisy-chaining of power leads.
 - a. **COM** - COM is the Common, or ground. In stand-alone installation, it is connected to the power supply. Power is 6-22 volts AC or DC. While the Signal System will run on AC, Atlas recommends DC for expansion of the Signal System. Use black wire.*
 - b. **PWR** - PWR is the positive or "hot" AC or DC Power. In stand-alone installation, it is connected to the power supply. Use red wire.*
 - c. **COM** - The second COM connection is used in multiple integrated installations. This COM is connected to the next Signal Control Board (SCB). Use black wire.*
 - d. **PWR** - The second PWR connection is also used in multiple integrated installations. This PWR is also connected to the next Signal Control Board (SCB). Use red wire.*
5. **J5- (Jack 5)** - J5 is a screw-type connection strip used for input/output connections.
 - a. **TM** - TM is the Turnout Module connection. It can be connected to Custom Signals turnout signal control board. Use blue wire.*

b. DOUT - DOUT is the optional Detector Output. It is used to connect an auxiliary piece of equipment, (no more than +5VDC), such as an LED or relay. Wire color optional.*

c. DIN - DIN is the Detector Input. It is connected to the insulated rail detector lead, (or the detector lead from the Atlas Block Detector Board (BDB), (Item #233). Use green wire.*

d. YIN - YIN is the Yellow Input. This connection is used if a second insulated block is planned to control the yellow "aspect" of the signal independent of the "timed" yellow, which is the default setting. Use yellow wire.*

6. **J6AIN- (Jumper 6)** - J6AIN is the Approach Input. It is a solder pad that is used with the "approach" lighting feature.
7. **AUX1** - Reserved for future use.
8. **JP1- (Jumper 1)** - JP1 is used for "approach" lighting options. Both JP1 and JP2 come from the factory with the jumper plugs covered by a black plastic cap.
9. **JP2- (Jumper 2)** - JP2 is used for searchlight style signals that use a single bi-color LED for three color output.
10. **LED1** - LED 1 is used to indicate whether the Signal Control Board (SCB) is wired correctly. If lit, it is correct.

**Please note-Atlas recommends their readily available brand of 20 gauge, multi-stranded copper wire that comes in a variety of colors, Item#'s 315-#319.*

C. BLOCK DETECTOR BOARD (BDB)

DEFINITIONS

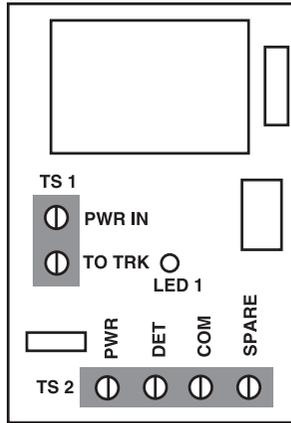
TS1

PWR IN - Power from transformer or power supply
TO TRK - Wire to insulated rail used in block

LED 1 - Used for visual indication of block occupancy. Will be lit whenever the block is occupied

TS2

PWR - Signal Control Board (SCB) power 6-22VAC or DC
DET - Detector output connects to "DIN" of Signal Control Board
COM - Common or return from power supply
SPARE - Unused connection

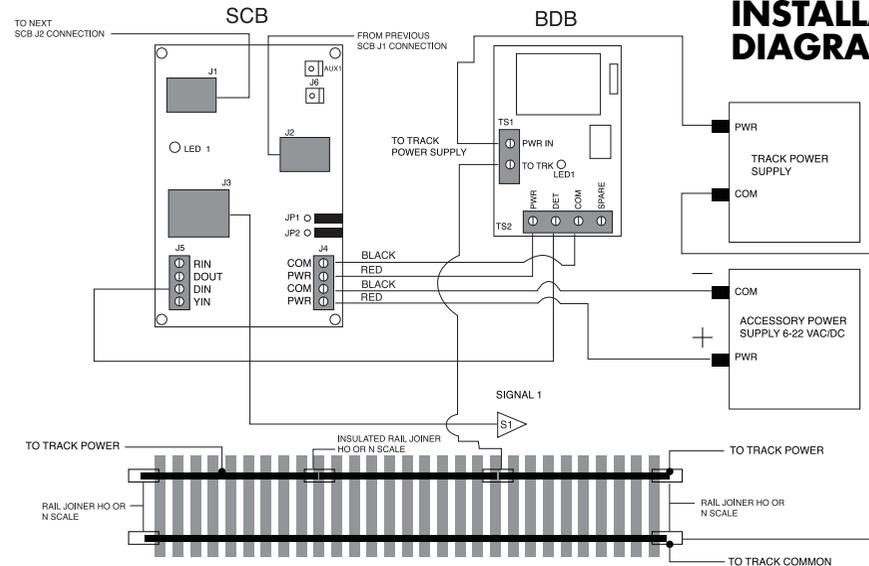


D. THE BASIC INSTALLATION OF ONE SIGNAL

Now that you have familiarized yourself with the SCB and BDB diagrams and definitions on pages 7-8, you are ready to install your first signal using the basic installation diagram on page 10. The initial step is to determine the signal location. The signal is normally placed at the entrance to a block. (A block is any section of track that is electrically isolated from the rest of the layout.) Next to a straight track, the signal should be positioned approximately 8-10 scale feet from the outside track edge. Placing a signal on a radius should be carefully done in consideration of your longest rolling stock. Experiment with a variety of cars to determine the correct space from the outside track edge.

Atlas recommends that the SCB be mounted under the table with the supplied bracket. However, the SCB can be mounted anywhere on the layout. The shed can be located on either side of the track in relation to the signal, for static display. (See diagrams on next page for under the table positioning and installation.) Run the red (PWR, +) and black (COM, -) power wires (available separately) from the J4 terminal strip (PWR) of the SCB to power leads of the unplugged source of power, (6-22VAC or DC power pack). See pages 7-8 for definitions.

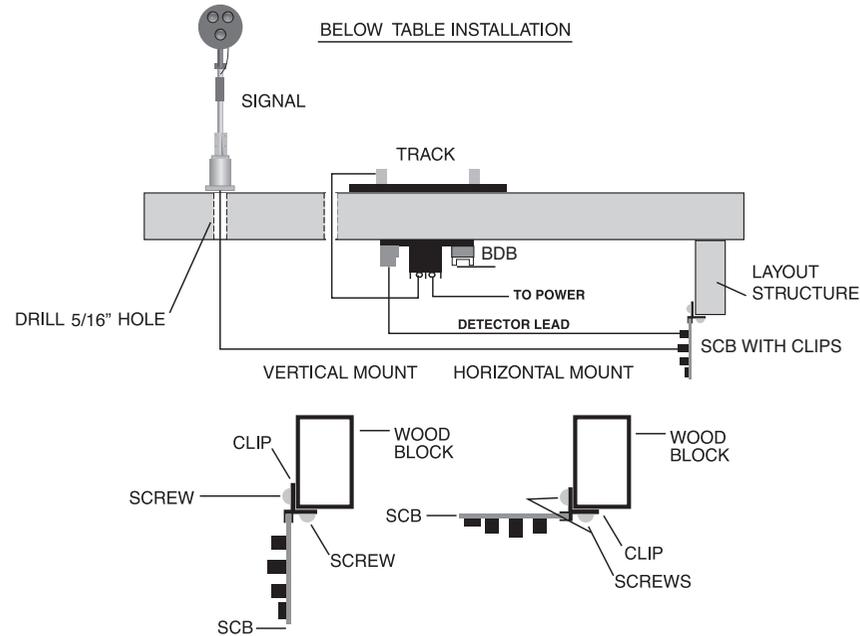
BASIC INSTALLATION DIAGRAM



E. INSTALLATION OF SCB & BDB

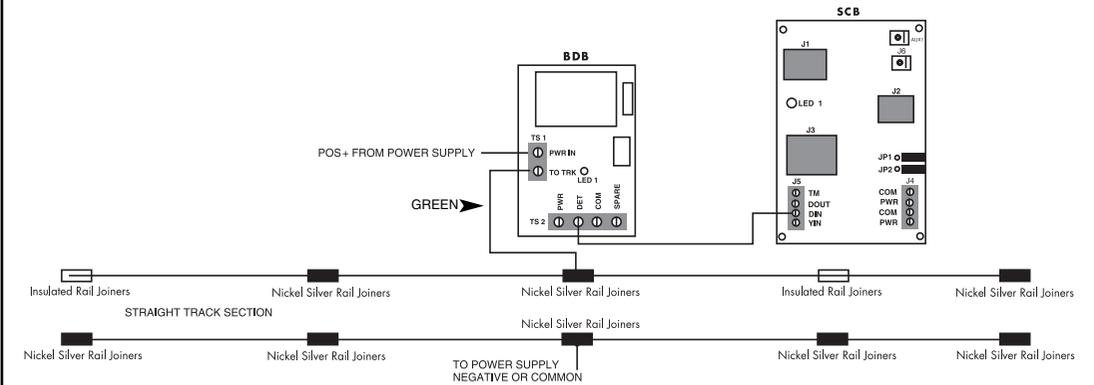
Insulate one rail on a section of track. (See page 12 for detailed instructions.) Connect the wire from the DET terminal of the BDB to the J5 terminal strip marked DIN on the SCB. Drill a 5/16" hole under the signal location and drop the plug from your signal into the hole. Plug the 6 pin signal jack into the input marked J3 on the SCB. The installation is now complete.

Please Note: The BDB can be attached to the underside of the layout table using screws (not included).



F. INSULATED RAIL SECTIONS

For best results when using insulated track rails in conjunction with the BDB, it is recommended to use a minimum of three sections (HO = 9" sections; N = 5" sections), or more. As shown in the diagram below, remove two nickel silver rail joiners from one of the running rails and replace with plastic insulated rail joiners. Between the two insulated rail joiners, solder a BDB wire (green) to one of the nickel silver joiners of the intermediate track sections or replace the existing joiner with an Atlas Terminal Joiner. The wire should be of sufficient length to reach the BDB and is connected to the TO TRK.

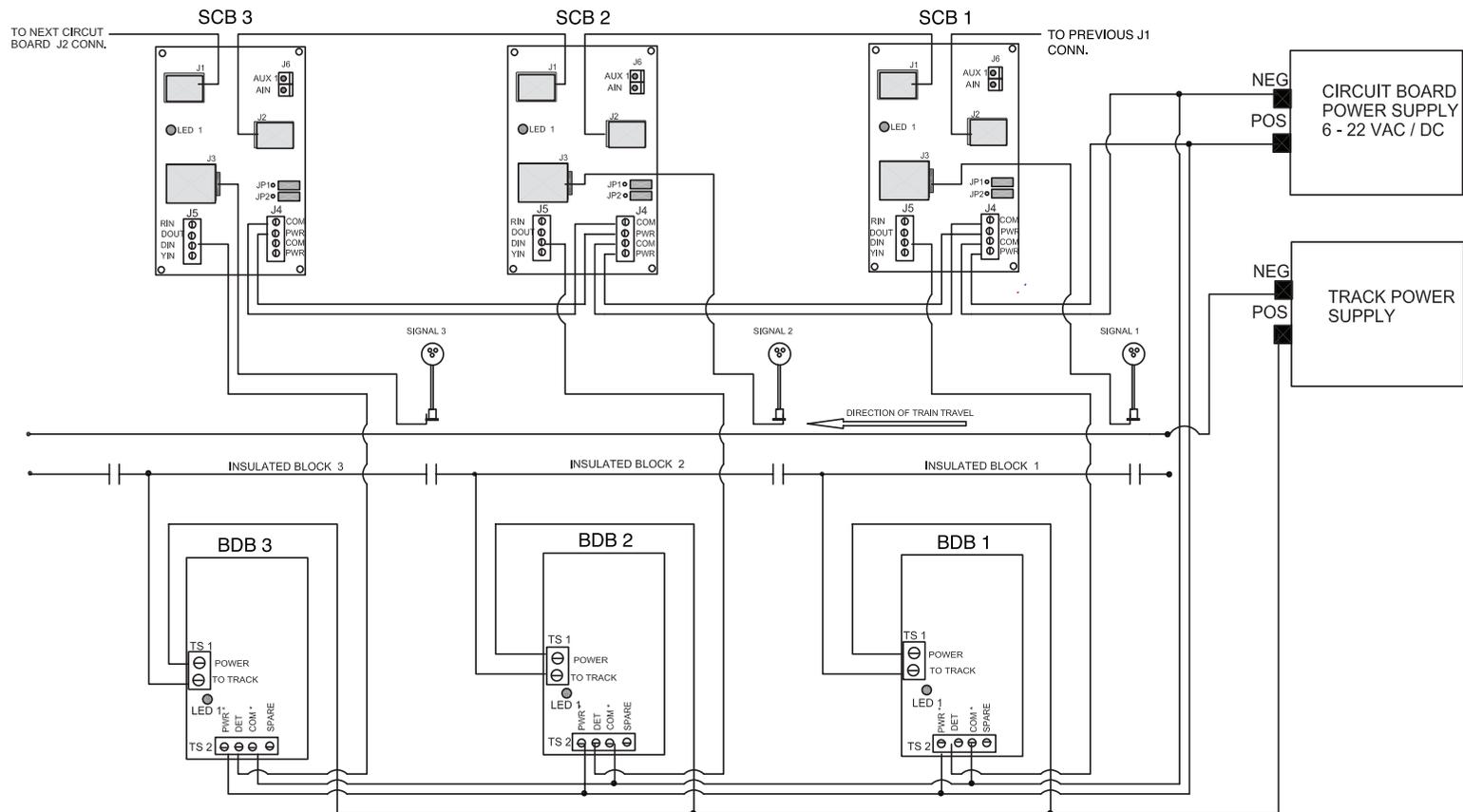


G. INTEGRATED OPERATION OF 2 OR MORE SIGNALS

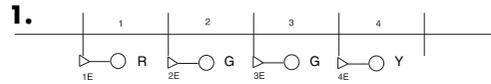
To add integrated signal operation of two or more signals, you need to plug in the modular Atlas Model Signal Cable (Items #230-232) in the length that is appropriate for your block size. The cable is available in lengths of 7', 15' and 25'.

Plug one end of the signal cable into J1 of the SCB1. The other end will go into J2 of SCB2. Repeat for every signal.

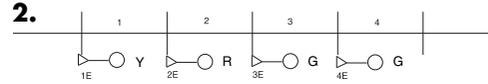
Installation of the integrated Signal Cable automatically disengages the timed yellow aspect. All aspects are now under full control of the blocks and signals in front of and behind your train.



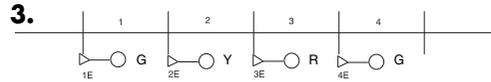
TYPICAL INTEGRATED ONE-DIRECTIONAL SIGNAL SET-UP



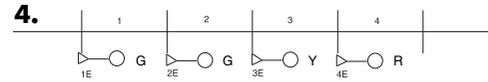
WHEN THE TRAIN ENTERS BLOCK 1, SIGNAL 1E WILL BE RED.



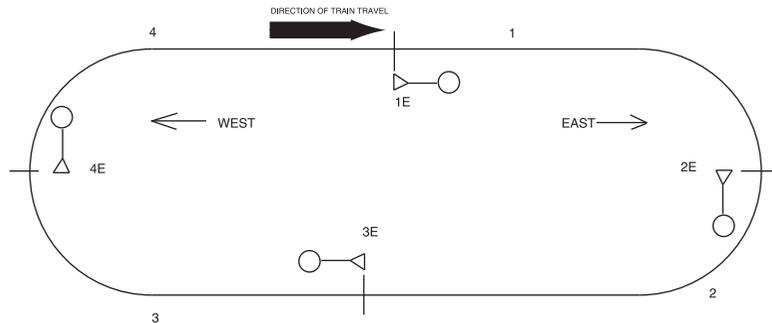
WHEN THE TRAIN ENTERS BLOCK 2, SIGNAL 2E WILL BE RED.
BLOCK 1 SIGNAL (1E) WILL CHANGE TO YELLOW.



WHEN THE TRAIN ENTERS BLOCK 3, SIGNAL 3E WILL BE RED.
BLOCK 2 SIGNAL (2E) WILL CHANGE TO YELLOW. BLOCK 1 SIGNAL (1E)
WILL BE GREEN.



WHEN THE TRAIN ENTERS BLOCK 4, SIGNAL 4E WILL BE RED.
BLOCK 3 SIGNAL (3E) WILL CHANGE TO YELLOW. BLOCKS 1 & 2 SIGNALS
(1E & 2E) WILL BE GREEN.



KEY

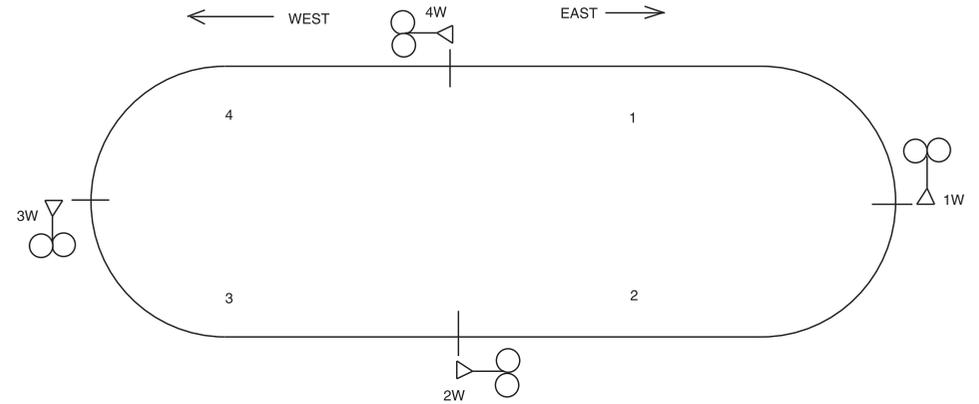
G = The lit aspect will be green

R = The lit aspect will be red.

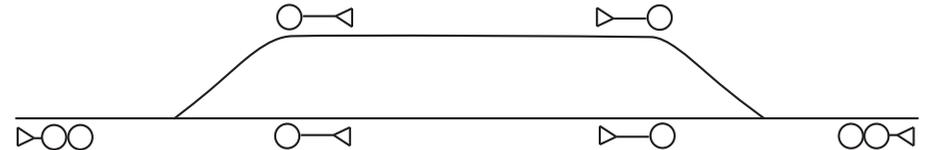
Y = The lit aspect will be yellow.

BLOCK NUMBERING EXAMPLE TYPICAL 4 X 8 LAYOUT WITH 4 BLOCKS INSTALLED

TYPICAL INTEGRATED BI-DIRECTIONAL SIGNAL SET-UP



PASSING SIDING



H. APPROACH MODE OPERATION

On many prototype railroads, signals remain dark until a train is approaching. The Atlas Model RR Signal System has the capability to duplicate this operation. In the diagram found to the right, Signal #1, which is connected to Block #2, will remain dark until a train enters Block #1. The signal will then light green for the approaching train.

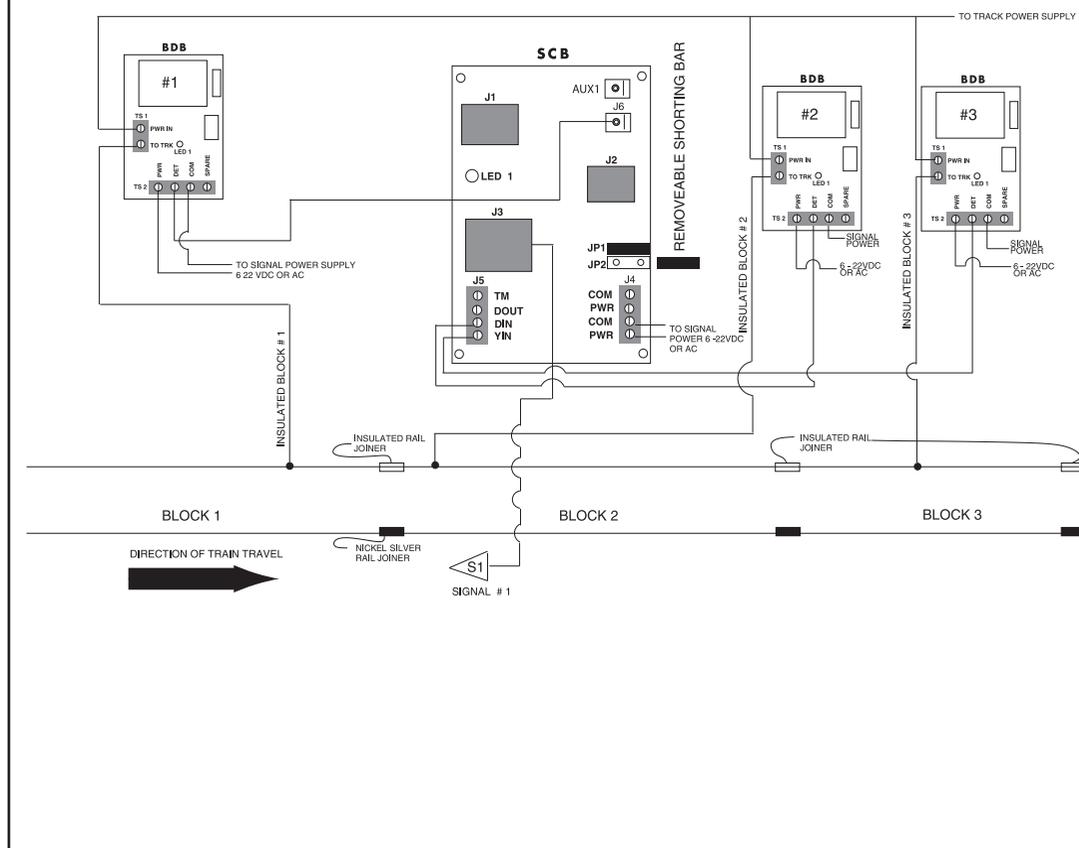
For stand-alone signal operation, a wire from an insulated rail section in the block ahead of the signal must be connected to the TO TRK terminal on the BDB. A wire is then run from the DET terminal of the BDB to the J6 pad on the SCB. The wire must be screwed to this connection. Also, a wire from the insulated rail section behind the signal must be connected, through a BDB, to the YIN terminal of the J5 strip on the SCB. The enclosed jumper plug must be installed across the JP1 pins, (see page 19 for 'Setting the Jumper Plugs').

The signal will now follow the pattern of "Off – Green – Red – Off". If a train is occupying Block #2 and another train enters Block #1, the signal will be red. Similarly, if a train is occupying Block #3 and another enters Block #1, the signal will have a yellow aspect.

If you are using a fully-integrated wiring scheme, and all of the signals are connected with the Atlas Model Signal Cables, approach lighting is very easy.

Only the jumper plugs across the JP1 pins on each of the SCBs are required. Separate wires and detectors for the J6 and YIN terminals are not necessary.

APPROACH MODE

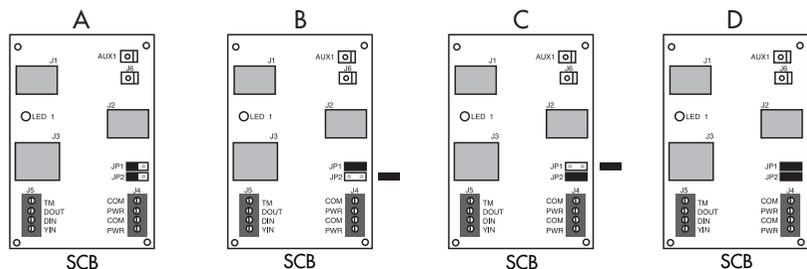


I. SETTING THE JUMPER PLUGS

The jumper plugs are found on the right hand side of the SCB, location JP1 and JP2. The default (as delivered) setting has both jumpers partially covered with black plastic shorting plugs. Basic stand-alone and integrated operation will not require movement of these plugs. The plugs are moved into different positions if approach mode, searchlight, or more advanced optional features are being used. If needed, the plugs may be removed by carefully inserting a knife along the bottom edge of the plastic cap and gently twisting the plastic up. Use the following chart, with corresponding examples below, to determine the correct jumper settings for your installation:

Example Description

- A Standard, Default Setting - Both jumpers, JP1 & JP2, are partially covered. This is the standard, default setting. Neither approach nor searchlight features are active.
- B Approach Mode Option - The JP1 plug is covered and the JP2 is uncovered. This setting initiates the approach mode option explained on page 17 in this manual.
- C Compatible Searchlight - The JP2 plug is covered and the JP1 plug is uncovered. This is used only on compatible searchlight systems.
- D Searchlight Style Target - JP1 and JP2 are covered. This would be used if you installed a searchlight style target using a bi-color LED and you wanted it to work in the approach mode.

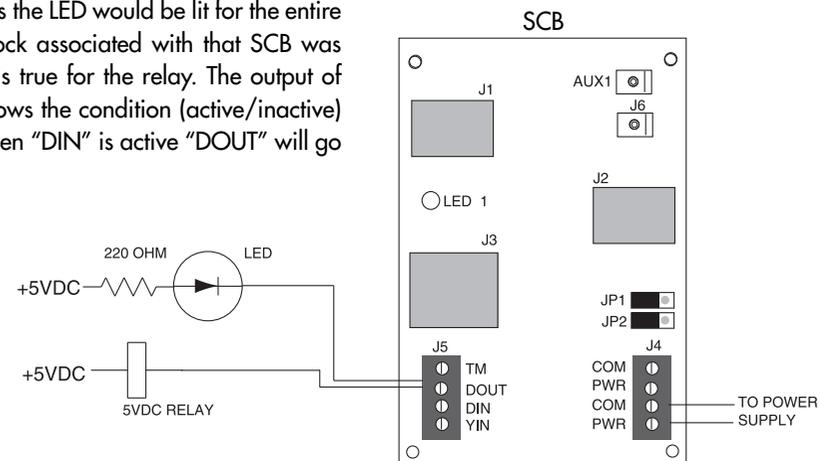


J. OPTIONAL FEATURE

DOUT stands for Detector Output which is located on the lower left hand side J5 terminal strip of the SCB (see diagram below). It is used to connect an auxiliary piece of equipment such as a control panel LED or a relay. An important point to keep in mind is that whatever optional piece of equipment you install, it cannot have an operating current that exceeds +5VDC.

The diagram below illustrates some basic applications that can be implemented by utilizing the DOUT lead found at J5 on the SCB. The top application, shown to the left of the board, represents an LED that could be mounted on a control panel setting to give the operator a visual indication of what blocks are occupied. A second application pictures the coil of a relay. This relay could be used to operate a variety of other applications by using the contact sets (DPDT relay) associated with the relay.

In the above examples the LED would be lit for the entire time the insulated block associated with that SCB was occupied. The same is true for the relay. The output of the "DOUT" lead follows the condition (active/inactive) of the "DIN" lead (when "DIN" is active "DOUT" will go active).



K. SIGNAL SYSTEM PRODUCTS

ITEM #	DESCRIPTION	MSRP/ UNIT	PACKING STYLE
HO & N ATLAS MODEL RR SIGNAL SYSTEMS! – NEW SIGNALS!			
230	7' Signal Cable	\$3.95	—
231	15' Signal Cable	\$7.25	—
232	25' Signal cable	\$10.95	—
233	Analog Block Detector	\$12.95	—
HO SCALE			
234	HO Signal Control Board	\$19.95	—
235	HO Type "G" Single Target	\$29.95	A
236	HO Type "G" Single Target Kit	\$49.95	B
237	HO Type "G" Single Target (4-Pack)	\$99.95	C
238	HO Type "G" Double Target	\$39.95	A
239	HO Type "G" Bi-Directional Single Targets	\$39.95	A
N SCALE			
2234	N Signal Control Board	\$19.95	—
2235	N Type "G" Single Target	\$29.95	A
2236	N Type "G" Single Target Kit	\$49.95	B
2237	N Type "G" Single Target (4-Pack)	\$99.95	C
2238	N Type "G" Double Target	\$39.95	A
2239	N Type "G" Bi-Directional Single Targets	\$39.95	A

Packing Style Notes:

A - Includes the signal, jumper wire (signal plug to RJ-11 jack), and signal shed.

B - Includes the signal, jumper wire, signal shed, signal control board and (analog) block detector.

C - Includes 4 pieces each of the signal, jumper wire, and signal shed.

To see a complete list of products that Atlas has to offer, please visit your local hobby store or check out <http://www.atlasrr.com>. You may also send \$5 to the address shown on the back cover for a *Track and Accessories Catalog*.

CONTACT INFORMATION

If you have any questions about operating or installing your Atlas Model RR Signal System, please call 908-687-0880.

For more information about signal systems, Atlas finds the following books helpful:

- *Railroad Signaling* by Brian Solomon
- *Realistic Model Railroad Operation: How to Run Your Train Like the Real Thing* by Tony Koester

Both books are available from Amazon.com. *Railroad Signaling* is published by Motorbooks Intl. *Realistic Model Railroad Operation: How to Run Your Train Like the Real Thing* is also available from and published by Kalmbach Publishing.

NOTES

WARRANTY

Atlas Model Railroad Co., Inc. warrants that this Signal System product will be free from defects in material and workmanship for a period of 90 days from the date of purchase. If this Signal System fails during the warranty period, carefully pack the item in the original carton, together with the dated sales receipt, and return to: Atlas Model RR Signal System Warranty, 378 Florence Avenue, Hillside, NJ 07205. Defects due to misuse, improper maintenance and/or abuse are not covered by the warranty. Items that have been disassembled or tampered with by the modeler or anyone other than an Atlas repair person are not covered by the warranty. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

CAUTION - This is an electrically operated product. It is not recommended for children under 12 years of age, as with all electric products.

Precautions should be observed during the handling and use to reduce the risk of electric shock.

Please unplug your power source after you have finished your operating session.



Atlas Model Railroad Co., Inc.
378 Florence Avenue • Hillside • NJ • 07205 • USA
www.atlasrr.com • 908-687-0880