Atlantic Coast S Gaugers - ACSG

"Promoting S Gauge along the East Coast"

ACSG Modular Layout Specifications

Tips and Hints

All tips, hints, commentary, calculations, and advice provided by Calvin Azarowicz & Ted Zanders.
Butch Henion provided the photos of his 4 foot and T modules.

Conventions used in these guidelines

In all of the diagrams in this and the other module tips, the module wiring diagrams are shown as viewed from the underside of the module top, as if you have it turned upside down on the floor and are working on the wiring. The "inside" (operator) of the modular layout will be towards the bottom of the page and the "outside" (public) side of the module will be towards the top of the page. Instances where this is not the case are so noted. If track layouts are being diagrammed these are shown as if you are standing on the operator side with the top of the page again being the public's side.

Often times a supply source will be noted in the explanations. The following abbreviations are used for these sources:

HESCO:	Hesco Electronics Supply, Columbia, SC 803-254-4575
Lowes:	Lowes Home Improvement, Everywhere, USA
RS:	Radio Shack, Everywhere, USA
Skycraft:	Skycraft Parts and Surplus 2245 W. Fairbanks Ave Winter Park, FL 32789 www.Skycraftsurplus.com (407) 628-5634
Hoppy:	Hopkins Manufacturing (Hoppy brand electrical connectors) www.hopkinsmfg.com

Operating guidelines:

All electrical connections should be checked, rechecked, and checked again.

Problems must be corrected before working on accessories or scenery.

High-rail wheels and American Flyer link or knuckle couplers are recommended.

Three power sources are needed: outside loop, inside loop, and accessories.

Track can be powered with AC or DC as needed.

All engines should be repaired, cleaned, and tested prior to any show.

Visitors are encouraged to bring in their engines and/or rolling stock to test and/or run.

A minimum of 2 club members should be inside the layout at all times.

Additional members can be stationed outside the layout to help with re-railing.

One of the members inside the layout should stay close to the transformer(s).

Operating Accessory Tips

A. Power output varies quite a bit from one Gilbert transformer to the next. The amount of power available at a show also varies with the number of accessories. We have started using one Elk Products ELK-TRG 1640 16.5 VAC transformer for each module or group of modules for accessory power. 800-797-9355 or www.elkproducts.com. They cost about $9 and include auto-resetting overload protection. The voltage is more consistent than AF transformers. If you do this, make an accessory buss bypass wire 54-inches long so the club layout's accessory loop can maintain continuity through your module.

B. To power up these transformers, and for other uses as well, we have started installing power strips on each module or group of modules. These need to have 4-foot cords, so you can plug one module into another, and have the outlets oriented 90-degrees to the length of the power strip so that transformers will hang down vertically when plugged in and not get pressed against the bottom of the table top. Ace Hardware has them for $7.99 and Office Max occasionally has them for free, after rebates, in their Sunday ads. The less expensive ones at ACE Hardware have a 3-foot cord and will not work on a 4-foot module. Four foot models as follows.

    Ace #33529

    Belkin F5C050

    Recoton "Spikemaster" SMSG7

C. We have modified all accessories to operate well from the ELK supplies. K-Line solenoid accessories will need 8 to 10 ohms resistance with the Elk power supplies. Get the good 50-watt metal ones since they run cool and won't melt the

plastic if you mount them to the bottom of the accessory. The Lionel barrel loader will need a 50 ohm 50 watt resistor. Required resistors will range from 3 to 10 ohms with AF transformers for K-Line stuff and 40 to 70 ohms for the Lionel Barrel loader.

D. If you intend to build a module where the accessory layout will vary from show to show, use lots of barrier strips. Have extra unused spaces on the barrier strips for future use.

E. Have 3 wires go to each typical accessory location on your module: Common or negative (Black), positive or 15V (Red) and switch controlled positive or 15V (Yellow). This will allow you to control an accessory by pressing a button connected to the yellow wire, and also allow you to power up lights or other features not to be controlled with a switch, using the constant 15V red wire.

F. Use extension wires with alligator clips at each end to attach accessories to the module buss wiring. Alligator clips will attach to bare wire, fahnstock clips, post and nut connections etc. You are making a temporary connection that only has to last for 8-16 hours. If the alligator clips would be exposed on the top of the layout then run wire from the accessory to under the table and then connect to the accessory under the table with the alligator clips. Having alligator clip wire in red, black, yellow and green is a plus.

G. Solenoid items don't buzz on DC and work better at lower volts. HOWEVER, kids like the BUZZ. And enjoy quicker moving accessories. The K-Line Forklift gets more use than the Lionel /AF unit! (I think it is pure JUNK.-CA)

H. 16 VAC stuff that runs well without modification:

1. Horn and Whistles
2. Burning Building
3. Most "train" lights
4. Shell Oil Rig
5. Lionel truck train hand truck (On a personal layout slower would be more realistic)
6. Crossing gates and cross bucks

I. 16 VDC stuff that needs electrical modification:

1. Cornerstone Oil Rig. This is a DC unit so add a rectifier.

J. 11 VAC or 11 VDC accessories that need modification to run well:

1. K-Line Diesel Fueler (10 ohm resistor @ 16.5 volts OK also.)
2. K-Line Fork Lift (0-15 ohm rheostat @ 16.5 volts). As solenoid heats, more voltage is required. Adjusting the rheostat keeps it working well. Remove the solenoid and drill it out to accept a piece of aluminum tubing. The plastic melts and causes binding otherwise.
3. Lionel 6-14092 Floodlight Tower, The light sockets will melt and the chrome

bezels will fall off at 16V, so use a 15 ohm resister to drop the voltage.

K. Lionel Barrel Loader 3-6 VDC or AC. 3 volts is realistic, but too slow for kids at shows. I think this is why the K-Line is played with more. A 50-ohm resistor @ 16.5 volts works OK.

L. Due to train speed control, unique voltage requirements, etc., the Circus module(s) are easiest to be dealt with as being unique animals that don't follow the "standards." ELK makes a 12 VDC power supply the works well with the ELK 1640. Try to make everything work well on the ELK 1640 and you will save yourself a lot of headaches at shows.

M. Items that can have hidden wire if wires come up through a hole 1 1/2" from the aft edge of the module:

1. Steam Whistle
2. Lionel diesel Horn
3. AF Diesel Billboard horn
4. Oil Rig
5. Lionel Station
6. Burning Building
7. Lionel Drum Loader
8. Truck Train Terminal
9. K-line Drum loader

N. Items that do not have hidden wires. Holes must be drilled at desired location:

1. K-Line Diesel Fueler
2. Some Crossing gates

O. Accessories that HAVE NOT been used successfully at our shows or that have not been durable enough for continuous operation over a two day show. Consider setting them up with a button on the operator side of the module so you can demonstrate it for people rather than have them operate the unit.

1. Lionel/AF sawmill: The nylon gears fail after just a few hours and the boards tend to jamb.
2. Vib Rotor Lionel windmill: The rubber "fingers" wear and can't be easily replaced since the "washer" is glued on. Lasts about 20 hours of light duty.
3. Coal loaders, electro-magnetic cranes, etc. Anything that requires stopping and reversing direction or other sequential operations won't do well with "button pushers" that don't read.

Auto-Block Control System

A. The heart of the system is the Erie Signal Systems Current Sensing Detector, "The Detective". Joes Train Repair sells them for about $19.95. There is also a 4 pole double throw relay, and a rectifier in the "Auto-Block" Control box, the ABC.

B. The modular layout is divided into 4 sections:

   1. The protected block consisting of 1/2 the modules in the entire layout.
   2. The unprotected block consisting of at least 2 modules.
   3. The slowing block consists of at least one module but more are good.
   4. The stop block consists of a single module.

   These blocks are always set up in the following order going either clockwise or counter clockwise around the layout: Protected, unprotected, slow, stop. An insulator pin must be placed in the variable voltage track between each of these blocks.

C. The transformer connects to the unprotected block and powers the layout through the under table buss as always. Any time current flows through the under module wiring (the buss) to the protected blocks, current flow is sensed by "The Detective". When current is sensed, the relay in the "ABC" opens and cuts power to the slow and stop blocks. When no current is sensed, the relay is closed and the slow and stop block get whatever power the transformer is set to supply.

D. The slow block is always connected through the ABC to the unprotected block through a 1 to 5 ohm rheostat or a 1 or 2 ohm resistor of at least 50 watts. Be careful, a 50 watt resistor will still get HOT in this application. Skycrafters sells 100 to 250 watt resistors that stay COOL. When current is sensed in the protected block and the relay is opened, then power to the slow block runs through this resistor and the train receives reduced voltage while it is in the slow block. When the relay closes, the slow block is powered through a connection that bypasses the resistor or rheostat and it once again receives what ever voltage the transformer is supplying to the layout.

E. What it does: The system allows two trains to run on the same loop of track without one catching up to the other. As they go around the loop together one train will invariably start to catch up to the other. When the slower one enters the protected block, its current draw is sensed by the ABC and power is reduced to the slow block and cut off to the stop block. This first slows and then stops the train catching up to the slower consist until the slower train leaves the protected block and enters the unprotected block. When it enters the unprotected block its current is no longer sensed by the ABC and the faster train is released from the slow or stop block to once again try and catch up. The length of the protected block determines how far ahead the slower consist can get before the faster train is once again released to chase it around the loop.

F. Problems:

   1. The "E" units must be locked in forward. New engines from SHS and American

Models don't have this feature and so cannot be used with this auto-block system.

2. If a train derails in the protected block, it no longer draws current and won't be protected. Shorting out the whole layout in the process is NOT considered "protection."
3. Unless a second unprotected block is added, the trains can only run in one direction.
4. In addition to adding 4 insulator pins, the rails ends MUST be cut so they do not touch on the insulated sections.

G. Some cool thoughts on the use of this device:

1. Organize accessories on the slow block adjacent to the stop block to take advantage of the train coming to a stop. Some of these ideas may require use of an "IR" detector or give an opportunity for uses to operate accessories:

a. Turn on a Red block light.

b. Have a water tower or standpipe fill the tender on steam engines.

c. Load coal into the tenders or into hoppers or gondolas in the consist.

d. Use the MTH freight or passenger stations to load/unload.

e. Use the K-Line, or other, diesel fueler.

f. Have crossing gates come down the entire time train is stopped.

Miscellaneous Top Secret Stuff

A. Typically the outer loop is run counter clockwise and the inner loop is run clockwise. Plan the placement of your infrared sensors, block control/detectors, signage accordingly. However, this is all subject to change at the whim of the operators.

B. When operating the layout, if the cars uncouple, call "Break Away Inside" or "Break Away Outside" depending on the track with the problem.

C. If you can, look at a module closely before building one of your own. This will help answer a lot of questions that all the verbiage and diagrams just can't explain.

D. If you can't think of something to bring to the show, bring a small trash can for inside the layout. Oh yes, bringing trains and accessories to run and display is good! Just bringing yourself is also good!