

The CRM&HA Inc. Newsletter

May/June 2008

Dennis Moriarty/Editor

Volume 17 Number 3

Meetings are held at 7:15 PM on the 1st Thursday of the month at the Central Railway Museum

Editorial By Dennis Moriarty

Sometimes we get so busy that we don't say thank you. A big THANK YOU to all the members of our club that have worked so hard to keep our train headed towards its destination. The last few months have been amazing with all the volunteer work on the layout, the train show, and the museum. And let us not forget all the preliminary work that was accomplished in the years past, which lead up to the present destination of our train. Thanks to everyone involved, the station is in sight.

The newsletter could use more articles from the members. By now you must be tired of reading my ramblings. Consider sending me an article about any subject that may interest the CRM&HA Inc. members. Pictures are always welcome. "How to do" articles are always interesting. I don't remember anyone even mentioning DCC operation or systems. Has anyone tried to weather buildings or train cars? How about an update on the Central Railway Museum with pictures for the record! At least every 4 months. How about an article about your favorite train company: their history and present day operation if it still exists. Did you ever ride on a passenger train? When and where. These are just a few ideas, I am sure you can come up with others.

Dale Reynolds sent me this following the April 3 monthly meeting.

No one volunteered to present a program so the meeting was closed early. I would appreciate your making this column a permanent part of the first page of the newsletter. If you do not have any new data and no future programs, you may put a note under the heading that volunteers are needed etc like you have been doing. Other wise, delete the current appeal, it has not been effective.

Programs by Dale Reynolds, Program Chairman

May 1: 'Paul Scoles' Scenery' - Bruce Gathman

June 5: 'Clinic: Building Trees' - Jim Reece

July 3: Clinic: Installing DCC and sound decoders' - Jim McGinnis (tentative)

August 7: 'Clinic: Engine Tune-up' - Bob Folsom (tentative)

Programs for future months are under development. Bruce Gathman, Gerald Price, and I have videos to present. Also, we have made 'Future Programs' a permanent agenda item under 'Old Business' to prevent lapses when the program person cannot be present at a meeting.

Some new committees have been formed and the following club members were railroaded as the committee superintendents. Just kidding I know all of them are volunteers:

Superintendent of Train Shows: Bruce Gathman
Superintendent of Central Railway Museum: Bob Folsom

Superintendent of Central Railroad Festival: Ron Keith
Superintendent of Web Site Updates: Michael Childress

Superintendent of 501c3 Tax Option: Howard Garner
See the end of the newsletter for a complete list of officers.

Tools and supplies are going to be needed to build the new layout at the Central Railway Museum. Please check your shop for tools, that you no longer need, that you would be willing to donate to the club once we have a secure location to store them. Also, if you have left over materials from building your layout or other materials that can be utilized on the new layout please consider donating them.

As a **reminder** our newsletters can be accessed from the Internet; therefore we are no longer putting member phone numbers and addresses in the newsletter. Please print the membership list each time it is updated and sent to you by email, so that you can contact other members when required.

Please **email your information** and articles for the next newsletter or hand it to me at a meeting before **June 12th**. **You do not need to wait until June 12th**. **Newsletter information will be accepted anytime.**

Thank you Jim Reece, Bob Folsom, Bob Hanson, Curt Ehmann, Dale Reynolds, and Bruce Gathman for your contributions to the newsletter this month.

Also, thank you Howard Garner for putting the newsletter on the Web. And for managing the website for the last several years. Michael Childress will have a new CRM&HA Inc. website up and running soon.

**CEO COMMENTS
MAY/JUNE 2008
BY JIM REECE**

What can I say? Things are looking good for The Central Railway Model & Historical Association.

The February Train Show was a real success. And according to Superintendent Bruce Gathman, steps are being taken to improve the venue and make it a bigger and better show next year.

The Central Railway Museum story seems to get better each month. A lot of good work has been completed and Superintendent Bob Folsom says it's possible we could start building the layout by late July. Thanks to the help of the City of Central and the hard work of club members, this has been accomplished at the same time the clubs bank account has grown by 42%.

The planning of The Central Railroad Festival for May of 2009 has begun. This will give the club new avenues to grow and expand. Not to mention it is a great way to help and thank the City for it's support of CRM&HA. Superintendent Ron Keith will need your help in the month to come to make this a success.

Michael Childress has agreed to be Superintendent to Revise and Update the Web Site. With this updated web site we can promote the club and museum, display our personal layouts and make it easier for interested individuals to find our organization. Email Michael with any suggestions you have that will improve our web site.

501c3 Tax Option Superintendent Howard Garner is working to complete the forms so we can apply for this tax option. He indicated it would take a couple more months to have an answer.

Two-years ago we finished an interest survey of the club members. On the question related to what railroad modeling subject members would like to learn or teach,

the following lists shows them in order of most requested.

Want to learn

1. Landscaping
2. Engine Tune-up
3. Wiring
4. DCC Systems
5. Tree Making
6. Weathering
7. Kit Bashing
8. Bench Work
9. Layout Planning

willing to teach

1. Landscaping
2. Tree Making
3. Layout Planning
4. Bench Work
5. Wiring
6. DCC Systems
7. Kit Bashing
8. Engine Tune-up
9. Weathering

Many members wanted to learn several were willing to teach. But, as the last two years passed we did not have much activity. Now, would be a good time for those in the know to help those wanting to learn. Where applicable those teaching could work with Bob's Layout Committee to develop and teach the procedures and standards to be used on the new layout. Here is a good chance for those willing to teach to hook-up with the Layout Committee and develop classes from the list above.

Dale needs individuals to sign-up for our monthly meeting programs.

Please consider working with Bob's committee on standards, helping Dale fill his program schedule and developing a class that will match the reason many join our club. They want to learn.

**MINUTES OF REGULAR MEETING,
MARCH 6, 2008
Central Library**

The meeting was held at the Library and was called to order promptly at 7:15 PM by President Jim Reece. Maurice Hahn was introduced as a guest. Altogether, there were 17 members present, one guest, and the guest program presenter, Dan Hadley.

Howard gave a treasurer's report showing that the club made over \$5000 profit on the Train Show.

OLD BUSINESS

Train Show

Jim Reece announced that Bruce Gathman would chair the Train Show for next year. Bruce indicated that he would be researching a better location for next year's show. We will need more volunteers for operating the "Thomas" layouts next year; there will be even a 2nd and 3rd layout. In reviewing the past show, Jim McInnis and Glenn Nasworthy said they might buy a riding Thomas and charge riders. It was recommended that we start with \$500 in change for the next show, and

have new club brochures ready that show our meeting dates and times and location of the museum.

Museum

Bob Folsom gave a report of a meeting called for Monday, March 3 of HO Layout Committee Members and a few others very active in the Museum project. Howard Garner, Bruce Gathman, Ron Keith, Glenn Nasworthy, Richard Nichols, Jim Reece, Rob Seel, and Steve Zonay formed the committee. This group will act a steering committee for continued work on the Museum. Minutes of that meeting are separate from this report. Bob touched on the highlights of the meeting, including flooring choices. Maurice Hahn mentioned the new generation Linoleum products now being offered.

Central Town Festival

Jim Reece announced that Ron Keith would serve as club liaison to the Town of Central, and chair of Festival Committee. Brian d'Entremont, Bob Folsom, Bruce Gathman, Jim Reece, Rob Seel, and Roger Smith will serve on the Festival Committee. Ron gave a report on the recent meetings. May is being considered as the best month. CRM&HA will be responsible only for activities having to do with railroading, and the museum. Bobby Ballentine, chair of the Central Businessman's Council is looking into getting permission from NS to use their old right-of-way to the mill for installation of track to use for motor car rides. Bob Folsom mentioned that the Town of Central is creating a logo for use on banners and other promotional materials. The group agreed that we could and should have input on the design. Discussion about the plan of parking spaces around the museum also ensued. Bob will be meeting with Tom Cloer, recreation director for the Town of Central regarding the logo and the parking.

Website

Jim Reece announced that Michael Childress has volunteered to work with our website. He will attempt to contact Jon Thorpe, a former member of CRM&HA who was the last website master.

501-C-3

Howard Garner will pursue getting CRM&HA into that classification.

NEW BUSINESS

Sandy Eustis volunteered to be the club liaison to the Newcomer's Club. It was moved, seconded, and passed unanimously to have Sandy serve as the CRM&HA representative to Newcomer's. It was

moved, seconded, and passed unanimously to have Bruce Gathman produce more of the newly designed club flyers so that Sandy will have materials to pass out at Newcomer's Club meetings.

It was moved, seconded, and passed unanimously to purchase 7 sets of folding legs for use on the HO modular layout. Jim McInnis will get them. More discussion about the layout followed, and a group will be formed to pursue rehabilitating the layout.

PROGRAM

Dan Hadley presented a video sampler of his railroad video productions.

Respectively Submitted

Acting Stationmaster Bob Folsom

MINUTES OF MUSEUM STEERING COMMITTEE MEETING

Bob Folsom called the meeting to order at 7:00 PM, Monday, March 3, in the meeting room at the Central Railway Museum, 108 Werner Street, Central.

We will need 4 electric box extenders - Ron Keith will pick up. It was agreed that we don't need fans in the museum. Dimmable lights will be installed instead. We should start installing power in the Heritage Room. Ron Keith and Steve Zonay will finish power installation in the Meeting Room.

Bob Folsom will supervise finishing the Sheetrock installation (mostly sanding the joints at this point). The ceilings will be primed with white to see if this color looks better than the black originally planned. If white is OK, they will be finished with good quality satin eggshell finish white rather than "ceiling white" which is usually a lower quality.

The HO layout footprint was agreed upon.

It was agreed to continue to use ceiling mounted conduit to bring power to the light fixtures rather than try to run loose Romex through the attic. Installation of the security lights and emergency exit signs will have top priority.

For the floor covering, Rob Seel will obtain samples of rubber and carpet tile. The Meeting Room will definitely have carpet - other rooms to be decided.

The Heritage Layout footprint needs to stay 1 foot behind the opening to the main layout room. 1x2's will be used for a crown molding in all rooms. The staging for the HO layout will be in the Meeting Room and extend out from the wall approximately 18". The old beadboard in the Meeting Room will be covered with a new beadboard veneer. A decision to put the beadboard veneer in the rest of the room will be deferred to later.

Respectively Submitted

Acting Stationmaster Bob Folsom

**Minutes – Regular Meeting
April 3, 2008
Central Library**

The meeting was called to order by Engineer and CEO: Jim Reece at 7:15 PM. The meeting was held at the Library because the CRM meeting room is dusty from drywall sanding. 13 members and one guest were present. The Paymaster's report was sent by email. Dennis Moriarty stated that the newsletter information is due on April 12th.

OLD BUSINESS:

Superintendent of Train Shows Bruce Gathman stated that his committee investigated the old **McAllister Square Mall** 225 S.Pleasantburg Greenville, SC as a possible site for the 2009 train show. The mall will be available on February 28th and March 1st. They found out that the mall is owned by Greenville Tech and would require a donation to a charity for payment. They indicated that the amount we paid at the Easley fair ground train show would be sufficient. The mall has three wings with a size of 48 feet x 261 feet each available to us. That would be about 3 times the space that is available at the Easley fair grounds. Also the bathroom facilities are much better. There was a discussion about the location being so far from Central but it was decided that the location is acceptable.

It was reported that the expenses incurred on the materials used on the Central Railway Museum have been paid up to date by the City of Central. So far the CRM&HA Inc. members have put in 897 man-hours working on the building. It was reported that the Heritage room is ready for paint and drywall sanding is being done in the meeting room. Conduit has been run for overhead lighting in the train room and the emergency lights and exit signs have been installed. The insurance company will be notified. The city is planning to pave the parking lot by May. A discussion with the city indicated that the paving would not hinder the space required for a future outdoors-garden railroad.

No information about the spring 2009 Central Railroad Festival was available except that the logo presented to the city by Rob Seel has not been approved as yet. (See the logo on page 12 of the newsletter Ed.)

Jim Reece reported that Howard Garner indicated that there is a pile of paper work about 2 inches thick and that a fee of \$300 dollars will be required to get our 501c3 tax option. He expects to receive the tax option in about 2 months.

NEW BUSINESS:

Bruce Gathman gave a report on the CRM&HA Inc. portable layout. New fold up metal legs have been installed on all but one of the sections. All new backdrops are being made because the old ones are pretty beat up and are too tall to fit in the new carriers. The scenery is being worked on and all of the movable items such as buildings etc. are being fastened down. And items to tall to be put in the new carriers will be shortened. The wiring is all being brought up to DCC standards. Some work has been done to the carriers to make sure all the sections will fit properly.

Sandy Eustis stated that his booth at the Newcomers Club was a success and that 9 brochures were taken.

PROGRAM:

No program was presented so the meeting was closed at 8:10 PM.

Respectively Submitted

Acting Stationmaster Dennis Moriarty



Track Cleaning By Dennis Moriarty

Unfortunately the main reason for poor operation of a model train is poor electrical contact between the train and the track. This can be caused by a number of factors but in this article we will refer to all of them as "dirt".

How does track get dirty in even the cleanest of layout rooms? There are several reasons. The most common is caused because of dissimilar metals between the track and metal wheels. The chemical reaction when electrical current is present leaves a fine powder on the track. (If you have a choice, consider purchasing engines with nickel-silver drive wheels if you are using nickel-silver track to eliminate this problem) Next is oxidation that is caused by a chemical reaction between the oxygen in the air and the track metal. Oil from lubricating rolling equipment can get on the track and help hold dust, cooking emissions, smoke from cigarettes and other airborne materials to the track. Plastic wheels seem to attract dirt, maybe because of static electricity, anyway they get dirty faster than metal wheels and with time the dirt rubs off on the track. Sulfur in the atmosphere oxidizes and with the moisture in the air forms a dilute solution of sulfuric acid. Sulfur is more common in homes that use gas for cooking or are located in industrial areas. The common term is acid rain. Usually found near places that burn coal. Sulfur is not as much of a problem today as it was in the past because of air pollution regulations. Most gas is cleaned of sulfur before piping to your house but small amounts probably remain in the gas. Sulfur is a natural substance found in crude oil and gas deposits.

All tracks oxidize. In the early years of model railroading track was made of steel, which would rust. To stop this problem and to help with conductivity of electricity on long track runs the track manufacturers changed the metallurgy to brass. Brass has one problem in that the oxidation that forms on brass is not as conductive as clean brass. If trains are run on

brass tracks often, the oxidation doesn't seem to be a problem as the wheels knock some of the oxidation off before it can form. Brass works very well and on my layout there are some brass turnouts. I only need to clean them by hand twice a year. So don't turn up your nose at brass turnouts if you can get them at a reduced price at a train show. In HO scale I don't believe brass turnouts are manufactured any more. The last G scale track I purchased was made of brass. The manufacturers of track continued to try and find a material that would solve oxidation and conductivity problems. They decided that nickel silver would be a better choice than brass. The reason is that the oxides of nickel silver conduct electricity better than brass oxide and you can go longer between cleanings.

How often? Some people like to clean on a regular schedule. Since conditions are different in each layout room the schedule must be determined by conditions. If you notice the headlights flickering or the engines jerking, it is time to clean by hand. Another way to tell is to take a paper towel and rub the track. If there is a dark black streak on the paper it is time. The use of a track-cleaning car will extend the time between hand cleanings of the track.

Track Cleaning:

Remember ceiling lights are your friends. If you hold your head in the correct location the light shines on the top of the track and you can see the dirt or the shine when it is clean.

Lets start at the beginning. After the track is laid most modelers apply stain on wooden ties or flat paint on plastic ties with a brush or spray gun. They then paint a rust color on the track sides and apply ballast to the ties. I find the best way to keep the tops of the rails clean is to use pine wood 2x4 lumber ends. Cut a 2x4 into several 1-½ inch lengths and rub the end grain over the track while the paint is still wet. The end grain of the pine absorbs a lot of the paint, and you can turn it over and use the other end when it gets soaked. Since the 2x4 are wide enough to slide over both tracks at the same time it cleans the top of the rail and doesn't disturb the paint on the side of the rail. Since you cut several you can throw away the used pieces. Be sure to check to see if ballast has accidentally been glued to the side of the track. If so it can be removed with a small screwdriver or knife and a toothbrush. Solder can be removed from track tops by sliding the 2x4's over the spot while it is still liquid or by using a small flat file. Try not to get it on top in the first place. Ballast debris should be vacuumed before running trains to keep the ballast dust out of the gears.

Next is maintenance hand cleaning. Several manufacturers make cleaning blocks that look like an old rubber typewriter eraser but are impregnated with a fine grit. One of the most famous is called a Bright

Boy. I don't recommend using these blocks except for brass where the oxidation is harder to remove. These blocks make small scratches in the track surface, which create anchor points for dirt and make it easier for the track to oxidize. The only time they should be used if something gets on the track that cannot be removed in any other way. Typewriter erasers without grit are available at office supply stores. They are made of a soft rubber and have a light color end and an orange colored end. These erasers can be run over track and do a great job of removing oily dirt without scratching the track. If you find that these erasers just will not do the job, purchase cleaning blocks from several manufacturers. Each block has a different amount and size of grit. Use the one that will do the least amount of damage to your track and still do the job. The erasers and blocks collect dirt rapidly and can be cleaned by rubbing on a piece of 150-grit sandpaper tacked to a small board. Follow each track cleaning with a dry rag and vacuum to remove dust.

Liquid cleaners do not scratch the track and do not create dust and therefore are the preferred method of track cleaning. Several companies make track-cleaning liquids specifically for model train layouts. Most of them do a great job. Rubbing alcohol can be used in track cleaning cars. Alcohol evaporates rapidly and only works while it is wet. Other recommended liquids include Goo Gone and mineral spirits. All of these do a good job of dissolving grease and oil off the track. Be sure to test whatever you use to see if it damages anything on your layout that it might come in contact with. You don't want it to remove the paint off the side of the rails or damage cars or plastic wheels. Easy ways to apply the liquid is with a small paint sponge on a handle or use some of the liquid on a canvas glove and slide your finger over the track. After all ten fingers are dirty turn the gloves over and use the backside. The glove can be cleaned in the laundry. Wet paper towels do in a pinch but may leave fibers that should be vacuumed. Clean 2x4-pine wood cut 1 ½ inch thick can be used. Moisten the end grain with liquid cleaner and rub over the track. The wood is soft and will not scratch the track. I have not tried it but another product that has been recommended for cleaning and polishing track and to remove scratches from the top of the track is called MAAS Polishing Crème. MAAS contains jeweler rouge that is a scratch remover.



Track Cleaning Cars:

A track-cleaning car can be placed in a train to constantly remove dirt from the rails. Above are the track-cleaning cars on my layout. There are many companies manufacturing track-cleaning cars, and they use different methods to clean the track. Some have materials that rub the track like the blocks mentioned above. Some of these blocks are made

round and roll over the track with a small amount of friction. Some add brushes to remove the debris and a magnet to pickup metal filings. Others have a tank on top that can be filled with track cleaning liquid or alcohol. The liquid is piped down to a pad that drags on the track. This car is helpful to clean areas that are not as accessible such as tunnels and hidden yards. For everyday use, a car with a simple felt pad that is located under and is dragged along the top of the track is sufficient. For year's people have been making their own track cleaning cars by gluing two nails to a small piece of Masonite. The two nails are then slipped up into two small holes drilled in the bottom of a boxcar. The Masonite slides on the track and the nails slide up and down in the car as required. Felt can be glued on the bottom of the Masonite or it can be dragged directly on the track. It is easy to clean because the nails simply slide back out of the car. The felt pad can be replaced or the Masonite can be sanded clean with 150 grit sandpaper tacked to a small board.

I recently read that fiberglass drywall tape cut into small pieces and attached to the pads under track cleaning cars does a better job than felt. Since the fiberglass drywall tape looks like window screen the dirt collects in the screen holes. Also, this tape has an adhesive backing, which is easy to put on and to peel off when it gets dirty.

Keeping the wheels clean will keep from spreading dirt. The cleaning of engine and car wheels was covered in the last newsletter. Every layout room should have a permanent wheel cleaning station available for convenient use.

Railroad Dates in History By Bruce Gathman

July 4th - Baltimore & Ohio Railroad lays first stone, 1828
 July 7th - U.S. Congress passes Pacific Railway Act, 1862
 July 15th - Grand Trunk Railway formed, 1853
 July 17th - Ephraim Shay is born in Ohio, 1839
 August 8th - Stourbridge Lion first run, Honesdale, PA, 1829
 August 25th - Joshua Lionel Cowen is born, 1877
 August 25th - First Baltimore & Ohio steam run, Tom Thumb, 1830
 September 1st - National Model Railroad Association organizes at Milwaukee, WI, 1935
 September 11th - San Francisco's Bay Area Rapid Transit carries first passengers, 1972
 September 20th - U.S. President Fillmore signs first Railroad Land Grant Act, 1850
 September 23rd - East Broad Top Railroad makes first run, 1874
 October 6th - Reno Gang first robs train, Jackson County, IN, 1866

October 9th - U.S. Congress sets transcontinental railroad gauge at 4' 8 1/2", 1863
 November 6th - Canadian Pacific transcontinental completed, 1885
 November 18th - U.S. and Canadian railroads first use Standard Time, 1883
 November 27th - Andrew Beard patents Jenny Coupler, 1897
 December 3rd - Camas Prairie Railroad begins operation, 1909
 December 12th - U.S. Congress passes Interstate Commerce Act, 1887
 December 24th - Great Northern Railroad completes Cascade Tunnel, 1928
 December 26th - U.S. Government temporarily nationalizes railroads for WWI, 1917

Switches not Turnouts By Dennis Moriarty

Many types of switches are available for use on a model train layout. Two items on a layout are sometimes called switches. One is a turnout, which is where track wyes and a train can be sent in one direction or another. The other is a switch used to stop the flow of electricity or direct electricity in other directions. For the purpose of this article track switches will be called turnouts and electrical switches will be called switches. This article is about switches; turnouts are another subject.

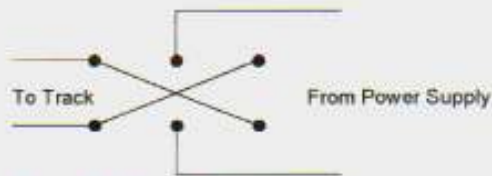
It is amazing the number of switch manufactures and types of switches. An Internet search will literally turn up thousands of different kinds. This article will be limited to switches commonly used on model train layouts. It will not go into electronic switch devices. That would be a subject for another entire article. Relays are forms of switches and will be discussed.



Toggle Switches:

The most common switch used in a layout is the toggle switch. It is defined as a switch that is turned on by moving a lever to the correct position. The reason they are popular for layout use is that they have a threaded

shaft between the lever and the mechanism. This makes it easy to mount them because a simple round hole can be drilled and the threaded area pushed in. The switch is held in place with washers and nuts. The most common type uses a 1/2 inch hole and the miniature toggle switches use a 1/4 inch hole. They can be purchased with different styles of paddles depending on the way you want it to look. They also manufacture rubber slip on paddle covers so that the switches can be color-coded. If you really want to jazz it up you can get lighted levers, but they are very expensive. Switches can be purchased with different electrical configurations. The terminology used is poles. For instance a single pole/single throw switch is used for on/off switching. It means that the lever makes a connection when thrown one way and opens the connection when thrown the other way just like the wall switches used to turn on the lights in your house. A double pole/single throw switch has two sets of contacts inside so that you can use it to interrupt electric current to two devices at once. For instance one side could be used to light a light bulb when the other side is used to send power to a track block. There are single pole/double throw toggle switches. They have three contacts on the bottom. When the switch is thrown to the right the center connection and the left connection is connected and when thrown to the left the center connection and the right connection is connected. This setup lets current from the middle connection go to either the right or left connector just like a turnout lets a train go from left or right. They are useful if you want one switch to power one or another device. Double throw/double pole switches have the same set up but there are two sets of three contacts on the bottom. These are very useful as they can be used to reverse to polarity of a track or a turnout motor. Toggle switch options are available with any number of configurations. Such as more poles or with a center off on a double throw switch. To use a toggle switch to activate solenoid activated turnouts use a center off double throw switch with momentary contacts. Turnout solenoids must be activated for a short time or the coils will burn out, this switch returns to the center off position when you release your finger. If you have a special need, you can find a toggle switch to fill it. For example there is one that has a monetary contact on one side, off in the middle and a fixed contact on the other side.



Wiring a Double Pole Double Throw Switch to Reverse a Train

Wiring double pole/double throw toggle switches to reverse polarity: There are six contacts on this switch. Wire the switch with the x pattern shown below. When the switch is thrown to the left, the internal contacts go from the center to the right. As you can see in the above sketch this reverses to polarity. When the switch is thrown to the right, the internal contacts go to the left and the polarity goes straight through the switch. One of the toggle switches in the picture above the toggle switch article heading is wired for this purpose.



Push Button Switches:

Push button switches come in almost all the same electrical configurations as toggle switches. One push can close contacts and another push opens them. The most common one used in layout work is the momentary contact push button switch. It is commonly used to operate solenoid turnout operators as the power is turned off when the finger is removed.



Relays:

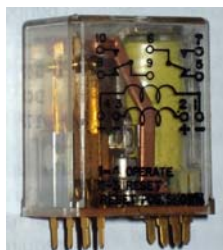
Relays come in many packages and configurations. Sometimes they look like the ones above and sometimes they look like a little black or blue box with pins coming out the bottom. It doesn't matter which package the relay comes in as long as it has the coil voltage that you need and the contacts will take the current needed. The relay works like a toggle switch except instead of throwing a lever by hand, an internal coil is energized to throw the switch. There are electronic relays but they are not part of this discussion. Relays can be purchased with all of the

contact configurations mentioned in the toggle switch section. For instance there are double pole/double throw relays that can be used to reverse track polarity as mentioned above or for any other use.

Relay coils come with different operation voltages. For model railroad use and for safety reasons relays should be purchased with less than 28-volt coils. The most common voltage used is 12 volts but most voltages are available from 5 volts up. 12-volt relays can be activated with power from most toy train transformers. It is recommended that DC coils be used because AC coils tend to hum and can be quite noisy. If your toy transformer has an AC current outlet, place a diode in series with the relay coil to change it to DC. There are three types of relay internal activation schemes that have use on the layout.



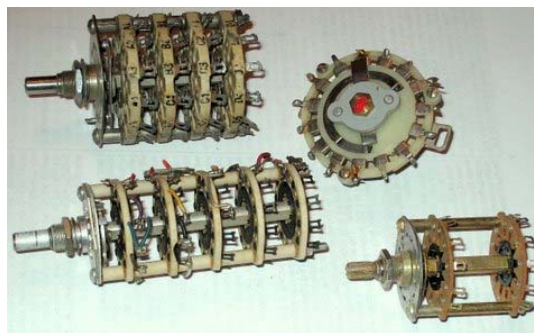
First is the common relay where the coil pulls an iron flapper with the contacts attached down and a spring is used to pull the contacts up when the power is turned off the coil.



The other is called a latching relay. This relay has two coils. When power is applied to one coil the flapper is pulled to the coil and when the power is applied to the other coil the flapper is pulled in the other direction. The flapper will remain in that direction until power is applied again to the other coil. These are very useful when used with turnouts to provide extra contacts for signals. On my layout, I use a double throw/double pole reversing relay to reverse the polarity of the track between return loops. Through a current sensor circuit the train activates one coil in a return track loop and activates the other coil in the opposite return track loop so that the polarity of the track allows the train to return. Reed switches could also be used to activate the relay for this purpose. Another latching relay changes the polarity of a pair of wires under the layout,

which follows the main line. Two volts DC is applied to this pair of wires. Since the polarity of LED lights only allows the LED to light when the polarity is in the correct direction, a pair of LEDs is used in a red and green signal at the tunnel entrances. The green LED is wired from left to right and the red LED is wired right to left. So when the train is going the proper direction the signal is green and if a train is coming out of the tunnel the signal is red.

Relay electrical contacts come in several configurations. Some have soldered connections, screw connections, slip on wire connectors, plug in connections for sockets, or connections set up for PC boards. Since we are not manufacturers, it does not matter much which kind we use as long as it is rated for the current and voltage that we are using. Wire can be soldered to each type of connection. An easy way of mounting relays is to hot glue them upside down on a flat surface on your circuit board. This makes the soldering easy because all the wires are on the same side of a circuit board. Of course if you are good at cutting square holes you can hot glue the bottom of the relay to the opposite side of the circuit board so that all the connections stick up through the hole. Commercial circuit boards can be purchased at Radio Shack but I find that a piece of Masonite or Plexiglas type material works just fine.



Rotary Switches:

Rotary switches can be mounted like a toggle switch because they have a threaded part that can be used to mount the switch into a round hole. Rotary switches can be purchased in many configurations. Sometimes they have ceramic wafers and sometimes other materials. The rotary switch has a shaft extending from the knob, which is used to turn contacts on as many rotary switch wafers as desired.



Each wafer can have several solder connections, which are contacted by a rotating disc in the wafer that has a contact that turns to each connection. This disk has a slide connection that goes to one of the solder connections on the side of the wafer. The wafers can be purchased with a multitude of configurations. These configurations can be used several ways. Some power supplies use a series of resistors that can be progressively added with a rotary switch with a lot of contacts to change the voltage. This system is not used much any more because of electronic voltage regulators. The main use for a layout is to control railroad yards. Several years ago I wrote an article about yard control and an updated article is included in this newsletter.

Reed Switches:

Another type of switch being used in some layouts is called a reed switch. It is simply a glass tube with a wire coming out of each end. One wire is attached to a brass strip in the switch and the other to an iron strip. When a magnet is placed near the reed switch the iron strip is pulled next to the brass strip and makes contact. Some people mount magnets under their engines and place the reed switch in the track by the ties. When the engine passes over the reed switch it closes the switch momentarily until the engine's magnet passes. These are sometimes used with latching relays. When the train passes over one reed relay it activates one of the coils in the latching relay to do something like close a crossing gate. And when it passes over another reed relay it activates the other coil in the latching relay, which disconnects to power to the crossing gate. Your imagination is the limit when using these devices.

Buying switches and electrical parts:

Do a Google search and you will be able to find a switch with a configuration to do any job. To cut costs it is recommend that you go to Amateur Radio shows, which are similar to our train shows. All of the switches and relays shown pictured above were purchased at Amateur Radio shows. I remember paying 50 cents for the latching relay. I believe they are about \$15 retail. You may find surplus dealers selling switches as well as other items like relays, light bulbs, wire etc. at greatly reduced prices. Also, there are discount and surplus mail order electronic dealers advertising on the Web that carries many useful items for the electrical work on your layout. Even Radio Shack sells a lot of switches but you may have to go to their catalog to find the one you want.

Rail Yard Control with Just Three Switches By Dennis Moriarty

A typical rail yard consists of several tracks laid parallel to each other to create a place to store trains, cars, engines, other equipment when it is not needed, and a place to assemble trains before they are sent to the main line. Some rail yards are entered from one end only and the train must back out from the direction it went in. Other rail yards have entrance/exit tracks at both ends. In addition to RR yards small yards are found at industrial sites.

The model railroader has to arrange the track turnouts so that the train will leave the main line, and may have to pass other yard tracks to enter the desired storage track. To do this the route has to be figured out and all the track turnouts in the route must be turned in the correct direction or a series of electrical switches in the cap must be lined up in the correct order. Also, power must be applied to the tracks involved (unless using DCC of course). If the switchman makes one mistake there can be disaster.

If the model railroad is equipped with electric solenoid or motor operated track turnouts, then the entire routing can be planned ahead of time. The cab can be set up so all that is required is to throw a rotary switch to the yard track desired, push a single button to provide power to the wafer that throws all the track turnouts in the proper positions, and a switch to provide power for the wafer that powers the track. The power switch to the track wafer should be off when selecting the desired yard track or engines on other tracks will start and stop as the rotary switch is turned. (When using DCC only the wafer to line up the turnouts is required.)

This requires a rotary switch with two wafers. One for the turnouts and one for power to the yard track. If desired, a third or fourth wafer can be added for signals and for lighting an LED on the cab map to show which yard track has been selected.

One of the rotary switch positions should be the main line track turnout line up so that trains on the main line can pass the yard if desired (you could label it track 0 (zero) or M (for main)). Its that simple! For example: Turn off the power switch to the power wafer, turn the rotary switch to yard track 6 – push one monetary push button switch to line up all the track turnouts to track 6 – throw the power switch to apply power to track 6. That's it, only three switches to control the entire yard.

There are two problems that are easy to overcome:

First if the track power is left on the power wafer, any engines left on other yard tracks will start and stop as the rotary switch is rotated past their positions. As mentioned earlier this is overcome by putting a toggle switch on the feed line to the power wafer. To

operate, you turn off the feed switch; rotate the rotary switch to the track desired and then turn the feed switch back on.

The second problem is in feeding the track turnout operators. The problem is as follows: in our example when feeding the turnout operators to track 6, one turnout is left and six are right, all of the wires to these operators would be soldered to the same terminal on the rotary switch position 6. When feeding track 7 one turnout is left and seven are right and all of the wires would go to the terminal on the rotary switch 7. The problem is that the wires from the solenoids also go to terminal six, which will feed back to wrong positions. This problem is over come by installing a diode matrix. Don't let this big sounding name (diode matrix) throw you, as it is really a fancy name for a very simple idea. Simply put, diodes only let electricity flow in one direction. So we put diodes on the rotary switch terminals so that the power flowing from one rotary switch position can't flow back to another and feed the wrong turnout operator. Why do we use a matrix? Because; it is a simple way of understanding and building the circuit of diodes.

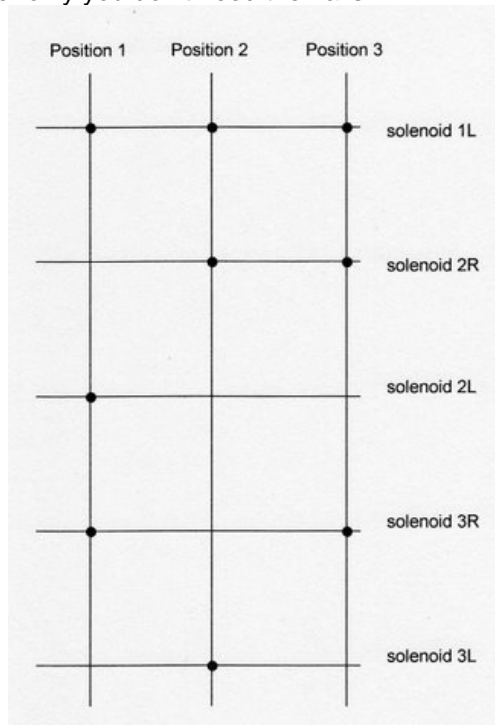


Diodes:

The kinds we use are sometimes called rectifier diodes or silicon diodes. They only allow current to flow in one direction. In the illustration above, the electrical symbol is shown above a diode. The arrow shows the direction of flow. The arrow points to a bar. If you look closely at the diode in the picture you will see a band around one end. This represents the bar in the symbol so it shows the direction of current flow, which in this case is left to right. Diodes come in many current and voltage ratings. Since we are using low voltages any voltage range will work. The current rating should be about one amp for most projects. Diodes with higher ratings will work also. The reason for this explanation is that Radio Shack sells packages with silicon diodes of a multitude of power and voltage ratings inside - at a reduced cost. Since our power and voltage requirements are low almost all of them will work.

Matrix construction:

This is a very simple idea but is hard to explain. One way is to solder diodes to all the terminals as the wires to the turnout operators are attached, but that can get confusing and messy. Another way is to build a matrix board. A matrix board is a series of parallel wires separated from another series of parallel wires and turned ninety degrees from the first set. This can be made by using a picture frame (made of insulating material such as plastic or wood) with small nails tacked every 1/2 inches or so on opposite sides. Copper hook up wire is run from nail to nail so that one side on the picture frame looks like a rail yard of wires. The picture frame is turned over and wires are applied in the same manner only in the opposite direction as the first set so that when viewing from the top the wires look like they are making squares. This can be done on perforated circuit board material in the same manner only you don't need the nails.



There should be one wire across the frame for each position of the track turnout operators. When using snap turnout operators there will be one wire per solenoid with the common going back to the power supply (two wires per turnout). You should number the wires with the turnout number and L or R for the turnout position. This can be done with a pencil, as the matrix will be hidden from sight when finished. On the other side of the frame there should be one wire for each terminal of the rotary switch. You should number the wires to correspond with the track number. Now comes the easy part, solder diodes from the terminal wires down to the desired turnout wires, and you are almost done. The power will go from the rotary switch to the diode to the wire to the turnout operator and there will be no feed back because the diodes keep the power from coming back to the other solenoids on the

same hookup. Each yard track position wire may have as many diodes attached as are required for the track route.

See the above factious example of a diode matrix. Each dot represents a diode soldered from the top wire down to the bottom wire so that the current flow goes from the rotary switch wafer to the turnout solenoid. If the rotary switch is in position 1 it will apply power to solenoid 1 left, solenoid 2 left, and solenoid 3 right. All of the diodes go from the top wires attached to the wafer down to the bottom wires attached to the solenoids. As you can see in the above example the power can not come back up to rotary switch position 2 and activate the solenoids in that circuit because the current will not go up a diode facing down. A matrix is not required for the track power wafer positions because the wires only go to the yard track block that is selected.

I said you are "almost done" because you have to feed power to the track turnout operators. When using snap turnout operators the power must be applied for a short period of time or the solenoids used to pull the turnout will burn up. This is accomplished by adding a momentary push button switch to the feed line going to the rotating part of the wafer. When in position 6, for instance, push the switch for a short time until you hear the turnouts move then release. You can use a similar set up for the motorized turnout operators or you can eliminate the feed switch altogether if the turnout motor can have power applied at all times. If the motor requires a polarity reverse to operate, a separate wafer may be used for each polarity. Be sure the diodes are in the proper direction on the matrix wires.

You figured out each route coming in and out of the yard when you set up your matrix so that you never have to do it again. I use a long powered wire to touch the matrix as I set it up to double check the track turnout positions when I install the diodes so that any errors can be corrected immediately. Your power supply must be large enough to throw several turnouts at the same time. The addition of a large low voltage capacitor to a DC supply power outlet will allow the use of a smaller power supply.

The construction may a little time consuming, but the resulting easy operation of the yard sure makes it worthwhile.

New Logo By Rob Seel

Thanks to Bob Folsom for stepping in just in time! The Town of Central was about to have a new logo design made by a banner company with a generic locomotive graphic. Bob took a "Step of Faith" and volunteered our club's services (particularly, yours truly) to get One Shot at a better design. So far, so good! If everything goes well, this logo will appear on light pole banners, letterhead, promotional materials, etc. in a couple of weeks!

More good will from the CRM&HA!

Robert M. Seel, AIA
RMS ARCHITECTURE



Member Early or Current Layouts

The following from Curt Ehmann:

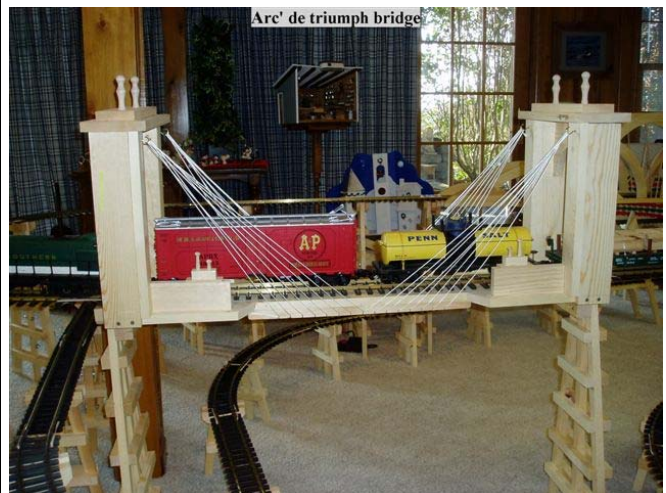
Here are a couple pictures of my former railroad. I also have a video of one of our train shows in the Firehouse. Let me know when you get around to an S-Gauge layout!



The Following is from Bob Hanson



Curt's S-Gauge Railroad





Rainbow bridge



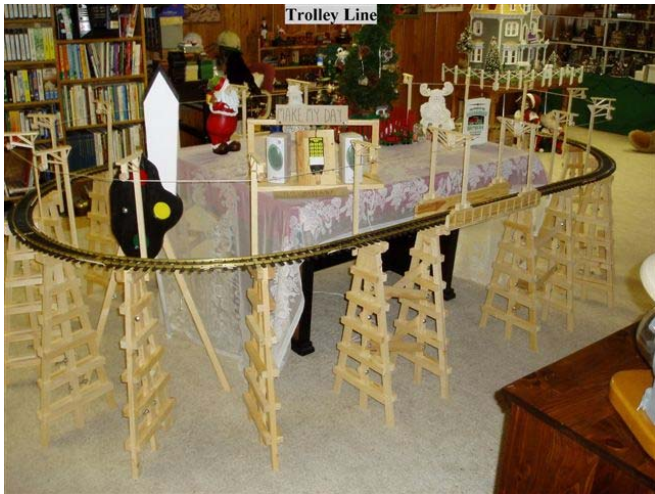
Trolley Line



Rainbow bridge



Counterweight bridge



Trolley Line



Part of main line looking West



Layout--east end



Downtown--from the East



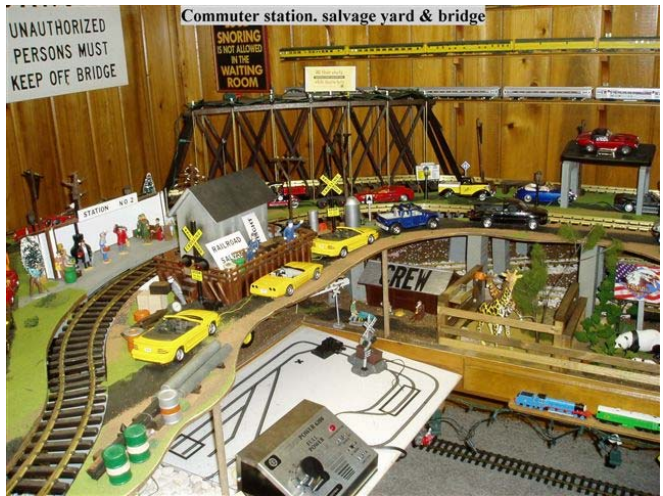
Used car lot



Repair shop



Main station--freight & passenger



Commuter station, salvage yard & bridge



Please send in your tips for future newsletters.

Interesting Web Sites

From Bruce Gathman:

You can download a free outhouse kit in all the popular scales by going to www.papercreek.com this is what the finished kit looks like.



Tips

Soon it will be time to harvest your Nandena pods. After they grow some more and start to dry out, the stems that hold the seed pods make perfect pine trees when covered with a layer of green ground foam, another layer of Hallmarks grass from their Christmas Village Collection and then another layer of ground foam. Use Aqua Net Hair Spray to attach each layer.

CMR&HA TRAIN CREW

Engineer and CEO: Jim Reece
General Division Super: Rob Seel
Stationmaster: Brian d'Entremont
Paymaster: Howard Garner
Large Scale Division Super: Bob Hanson
Program Chair: Dale Reynolds
Superintendent of Train Shows: Bruce Gathman
Superintendent of Central Railway Museum: Bob Folsom
Superintendent of Central Railroad Festival: Ron Keith
Superintendent of Web Site Updates: Michael Childress
Superintendent of 501c3 Tax Option: Howard Garner

Club Mail Box

PO Box 128, Central SC, 29630.

Paymaster Mail Box

(For Membership Applications and Dues Payments) PO Box 826, Pickens, SC 29671-0826

Central Railway Model & Historical Association Membership Application

Name: _____ Date: _____

Address: _____ Phone: _____

City: _____ State: _____

ZipCode _____ E-Mail Address: _____

1. Declared Interest Group: (Circle yours) Modeling Collecting RR-History Railfan General

2. Other Railroad Interests: _____

3. Modeling Scale: Z N HO S SN3 O G (Circle yours)

4. Railroad Memberships: NMRA NRHS Other? _____

5. Do you have a home layout? Y N Open to Visitors? Y N

6. I can help the Association by:

Working on one of the modular projects

Helping with set-up and operation of layouts at shows.

Organizing an excursion to a show or museum.

Serving on a committee (i.e. Audit, Publicity, etc.)

Serving as Officer or Director.

Preparing a short program for monthly meeting.

Other: _____

7. Please record my membership in the Association for the year. Enclosed is my (check) or (cash) for \$25.00, Send to CRM&HA, PO Box 826, Pickens, SC 29671-0826. Phone (864) 878-4705

Signature _____