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INSIDE THE OC&E

Let's Be Careful Out There!

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If you are a real railroad-operating employee, and happen to use your personal phone while on duty, even for a second, you could lose your job and be fined. We don't have to recite the tragedies that led up to these policies, as any railroad and model railroad enthusiast already knows the history and dangers of being distracted while performing the job.

Our HO scale trains would hardly cause death or injury if we had an unfortunate accident. But if one of our operators was distracted while running trains on our model railroad there is the chance for a collision causing damage to museum or personal equipment. Plus it is just plain rude to talk on the phone while you are in front of the public's eye.

Unfortunately we have had these problems. Nothing serious has occurred because of these actions, but just the same, some of our volunteers may have invested several hundred dollars in their personal equipment, and we would hate to see any damage due to poor judgment of another volunteer. And any kind of accident would be noted by our guests and might prove embarrassing. Let's take every possible step to prevent accidents. Just as the real railroads practice "Safety First" as the first order of the day, we should do the same.

We volunteer at the Colorado Model Railroad Museum to have a rewarding experience and to have fun. Nobody wants to have overly restrictive rules or penalties, so up to this point we haven't wanted to take severe actions against anybody who has not followed the rules. But that could always change if this continues to be a problem. We realize you are helping

the museum with your time and efforts, and we want to be as accommodating as possible.

What should you do if you need to take an important call while you are at the museum? If at all possible try to call back sometime when you are not running a train. If this call can simply not wait, stop the train, or call the dispatcher on the radio and tell them you have an emergency phone call. Try to have him route you into the nearest siding where you can safely park the train and then resume the call. Or ask if there is a "relief crew" available that can run the train while you are busy. In any event, DO NOT try to run the train while you are talking on the phone.

Cameras also fall into the "Personal Electronic Device"

category. Even if you are stopped in a siding, you shouldn't try to use a camera, especially a camera phone. It is very easy to accidentally change the throttle while you are fumbling with the camera. The best plan if you want to take photographs of the layout is to do it when you are off duty or better yet, before the museum opens in the morning.

Please remember that when we are on the museum floor we owe it to our visitors to be courteous and accommodating when they have questions or comments about the layout. Volunteers at the Colorado Model Railroad Museum have the privilege of running trains on one of the best model railroads in the world. We need to do that in a professional manner. As Dave Trussell would say at the end of the morning crew meeting, "Let's be careful out there!"



An unidentified OC&E Operator felt it was okay to answer his phone for a quick call from a friend. Unfortunately, while he was distracted, his train drifted through the switch at West Lakeview and may run head-on into another train that is coming down the hill.

Making Resistor Wheelsets for your Rolling Stock

By Bill Kepner

Museum volunteers are able to run their own equipment on the museum's OC&E model railroad. There are several requirements and perhaps the hardest for most of us to comply with is to have at least one "resistor wheel set" on each car.

The mainline of the layout is operated under *Centralized Traffic Control*, or CTC. Even though we use DCC (Digital Command Control) to control the trains, the track is electrically separated into blocks so that the CTC system can determine where each train is. Each block has a DCC Optimized Detector circuit board (DCCOD) wired in series with one rail; it senses the current draw of your locomotives and your resistor wheel set equipped cars.

You can imagine the problems that could occur if the DCCOD couldn't detect your cars. The Dispatcher's CTC Panel would only show the locomotive's location, and the Dispatcher would have no clue where the end of the train was. Signals wouldn't operate correctly, possibly allowing following trains to proceed into the block where your caboose was. More seriously, the interlocking logic in the CTC software would allow the dispatcher to throw turnouts while your train was still on them. And if part of your train became uncoupled, or a car was left on the main line, you might not know it; especially if it happened in a tunnel. It would be a big mess, hence the requirement for your cars to have resistors installed.

What if you only had resistors on the caboose; wouldn't that be sufficient? Actually that would be worse; as the CTC panel would show a "phantom train," that depending on the location of the train on the layout and its length, would be one or more blocks behind the locomotives. Or on a long block it might disappear altogether. So it is imperative that every car be equipped!

Note that passenger cars or cabooses that have lights that are powered by the track don't need the resistor, as the lights will draw enough current for the car to be detected.

The museum's car department will gladly install resistors on

the metal wheelsets you provide; the cost is usually \$1.00 per axle. Or you can buy wheelsets with them installed; prices start at about \$2.00 an axle. If you have a short train, these costs are insignificant. However if you envision bringing your 80-car coal train (or maybe even several trains) to run on the museum's layout, that can add up to a lot of money!



Photo 1

A surface mount technology (SMT) resistor turns a standard Intermountain Railway wheelset into a resistor wheelset.

It is actually very easy to make your own wheelsets and there is only a small investment to do so. Over the last several years I have installed resistors on over 1000 axles. I have found it really isn't difficult, and my process has evolved over time. Some of my friends also make their own wheelsets, and they do things a little differently. I always use metal wheels that have a metal axle and a single insulated wheel. When both wheels are insulated from the axle, or the axle

is plastic, you will have to do this slightly differently. Only the end result is important; not how you get there. So you can follow what I do, or you can develop your own process.

Dr. Bruce Chubb designed the museum's DCCOD boards a long time ago, and there are probably many thousands in service around the world. The bare circuit boards are available from JLC Enterprises (www.jlcenterprises.net), and they aren't hard to build your own. They have proven to be very sensitive, so you can use resistors with fairly high resistance; This is important on large layouts with many cars because they will draw less current from the track.

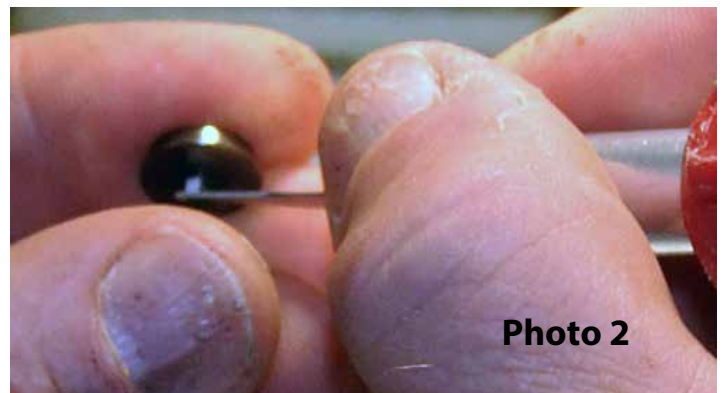


Photo 2

Dr. Chubb recommends using resistors between 10K ohms and 20K ohms on each car. The DCCOD's can be adjusted; so it's probably more important to use the same resistance that museum cars use, which is 10K ohms.

There are two items you need to purchase. The surface mount resistors, type 0805 (1/8 watt), are available from several Internet sources, such as Mouser Electronics, Jameco Electronics, or Digi-Key. Mouser's part number for the resistors is 667-ERJ-6ENF1002V, and if you buy 100 resistors the price is approximately \$0.016 each. The second item is the electrical conductive paint that is used to repair circuit boards. I have used "Circuit Board Repair Pens" because they were readily available from electronic supply stores such as Radio Shack or Mountain States Electronics in Fort Collins. But if you plan to do a lot of cars, Mouser Electronics sells 3/4 oz of "Silver Print" conductive paint for \$55.00.

I have had great results by using Gorilla brand super glue to attach the resistors with the contacts side up. You can alternatively use a 2-part epoxy or a rubberized CA Adhesive often used by the R/C car guys. First I put a small dab of glue on the axle next to the insulated wheel, place the resistor on it with a pair of tweezers, then use an X-Acto knife to move it to the desired location (Photo 2). Then I place it where the glue can dry. Once I get into a groove, I can usually do one every 15-20 seconds in an assembly line fashion.

After the glue dries sufficiently, I will use the X-Acto knife to scrape any glue off the resistor contacts. Don't be gentle; this is also a good check for whether you got a good bond

between the metal axle and the resistor. If you find that wasn't the case, this would be a good time to add extra glue around the edges.

Now it's time to use the conductive paint to electrically connect the axle and insulated wheels to resistor contacts. After shaking well, I usually cut the tip of the pen slightly so the paint will flow easier. Then I create a small pool (less than a fingernail's worth) of paint on a non-porous surface.

Working quickly, I will use a tiny screwdriver or something like a needle to spread the paint between the axle and the contact on one end, and then the contact on the other end to the wheel (Photo 1). Be as careful as possible to not bridge the two resistor contacts and to keep from bridging between the second contact and the axle. If you do that you won't have a resistance wheelset; you'll have a short circuit wheelset!

Let this dry for a couple hours. Afterwards it's time to test by using a voltmeter to check the resistance between the two wheels. You can either test with it installed on a car (Photo 3), or you can try holding a probe on each wheel, but you may find that awkward to do successfully. I built a small jig that holds an axle in place so when I apply pressure, it doesn't fly across the room. You should get a reading equal to the resistance of the resistor you installed. Note I use 12K resistors, so a small variation from the rating is expected.

What happened if you get a very low reading, such as only a couple ohms? You probably bridged the contacts, so you need to scrape the paint between the metal contacts.



Photo 3

This happens to me a lot and I use a motor tool to gently cut a gap in the paint (photo 4).

If you don't get a reading or get one that's much higher than your resistor value, go back and add more conductive paint. Worst case, scrape all the paint and any glue from the metal surfaces and start over. Then test again. Once you get the reading you expect, it's time to install on a car. Normally you only need one of these wheelsets per car, although putting one on both outside axles will ensure it is detected in both blocks it occupies if the car was straddling a block boundary.

Once you perfect your process, your friends will ask you to make some resistor wheelsets for their model railroad because now you are the expert!

If museum volunteers have any questions or problems on these techniques, you are welcome to contact the editor at drgw0579@comcast.net.

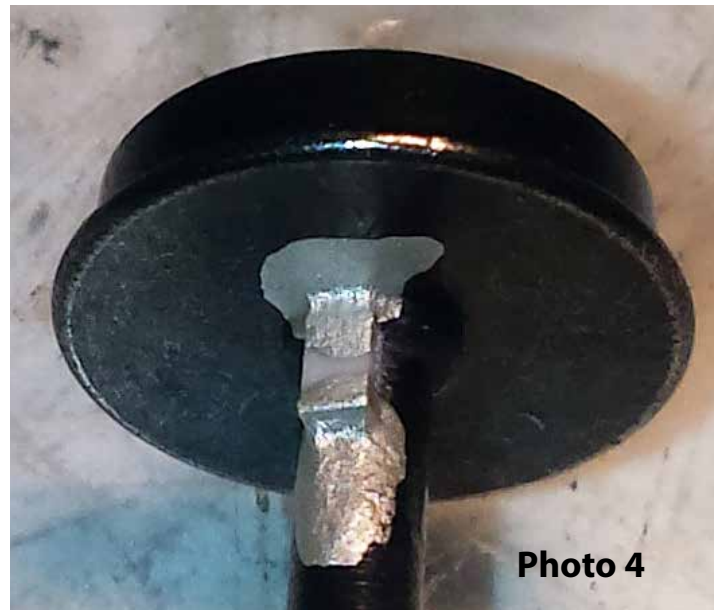


Photo 4

Alternatives

What are some of the alternatives you can try instead of my method?

Several museum volunteers reviewed the main article and offered additional suggestions.

Duane Fields uses traditional 1/8-watt axial-lead resistors mounted on the axle of his cabooses (right). He had drilled a small hole in each wheel and used conductive paint to ensure a good contact, note that the axle is plastic. Don't try soldering; you will melt the axle!

Bill Botkin follows a process documented by Scott Kurzwski, originally in the June 2008 issue of Model Railroader magazine, with an updated version available at:

<https://www.hitpages.com/doc/4634390508339200/1#pageTop>

This is an excellent article that shows a slight variation that positions the resistor at an angle so that one contact gets glued to the axle and the other is glued to the wheel as shown below.



Under Your Nose

Photos by Bill Kepner

One of the great attractions of the Colorado Model Railroad Museum is that you can come back frequently and see something new every time you visit.

I would guess very few of museum guests notice the innocent looking “trolley car” on the O Gauge Children’s “Thomas” layout. After all, the various locomotives from Thomas the Tank Engine race around their respective tracks making a lot of noise, and entertaining the children.

There’s one item on the layout that is a bit more reserved and hardly noticed. I have not heard anyone comment about the green and yellow, “CSU Colors”, Birney Street Car? Did you realize that it a model of Fort Collins Municipal Railway #23?

This is a Lionel #28421 Fort Collins Trolley that as far as I can tell was offered in 2007. While it is obviously a tinplate model, they did a reasonably good job of capturing the look of the real thing, and the real Fort Collins #21 still runs every weekend in the summer on the Mountain Avenue line in Fort Collins.

Fort Collins, Colorado, was one of the smallest towns in the country to operate a city-owned streetcar line. There were several routes that covered most of the town when it was built over 100 years ago. You might have seen the famous photograph of these cars meeting at the junction of three of the routes at the intersection of Mountain and College Avenues.

Originally built as part of the Denver and Interurban system, a subsidiary of the Colorado and Southern Railroad, the line first operated with much larger cars that required both a Motorman and Conductor.

By 1919, the City of Fort Collins had acquired the tracks and bought four new Birney Standard Safety cars, numbered 20-23, which could be operated by just the Motorman.

The service ran until 1951. When the equipment was sold off, all of the remaining cars found good homes,

except #23, which was apparently scrapped in 1957.

The cars that still exist include #20 at the Pioneer Village Museum in Minden, Nebraska; #21 that operates in Fort Collins; #22 that is at the Colorado Springs and Interurban Railway masquerading as CS&I car #135; #25 that is being restored to service in Fort Collins; and #26 at the Henry Ford Museum in Michigan (The later two cars had been acquired used much later than the first four).

Now you know.



Dino Days 2016

Dino Days, June 10th and 11th brought record visitors into the museum! Friday broke the record for highest attendance day ever, at 418 visitors. On Saturday we had 310 which is a very busy day! Dino days also featured the museum's

animatronic Dinosaur, Paisley. Children could meet Paisley and have their photo taken with her. NCMRC member, Terl Robinson brought his Dino Railroad to be displayed in the south building.





Terl and Karn Robinson assembling Dino Park

Another “Didn’t Make the Cut”

The 2017 calendar is on sale now at the Little Shop that Could Museum Gift Shop. We have been constantly trying new scenes on the railroad; sometimes they work out, other times they don't. This is another installment of “Didn’t Make the Cut.”

A sailor on one of the ships visiting Coos Bay must be a rail-fan. He took this photo of an OC&E switch engine from the deck of his ship, overlooking one of the lifeboats.

The docks are full of timber products, and it appears this ship will be loaded soon for a far-away destination. Will it be Japan, China, or South Korea? We sometimes forget how special the forests are in the United States and how scarce wood products are in other parts of the world. *Photo by Bill Kepner*



June Visitor Counts

	2012	2013	2014	2015	2016
Week 1	324	259	294	371	387
Week 2	387	346	333	881	958
Week 3	525	362	462	515	481
Week 4	393	416	496	727	445
Week 5		370	458		
Totals	1629	1753	2043	2494	2271
Avg	407	351	409	624	568
YTD	7882	8248	8135	9244	7931

Inside the OC&E

Inside the OC&E is the official newsletter of the Colorado Model Railroad Museum. Its purpose is to communicate news and information to museum volunteers and others interested in the museum.

The August issue **PUBLICATION DEADLINE: Tuesday, August 2, at 5:00 PM.** Send submissions to **drwgw0579@comcast.net.**

Bill Kepner, Editor.
Ed Hurtubis and Bob Owens, Associate Editors

Contributing to the Newsletter

The newsletter editor has had some recent inquiries about the types of articles that could be submitted for publication.

The purpose of the newsletter is to communicate information about the museum to volunteers, members, and other interested parties. Information about the museum's activities, exhibits, volunteers, and the OC&E layout is the primary focus. We don't intend to cover general model railroading topics, but we can have articles that will help increase your interest and skill level in museum activities.

We also include information about prototype railroads in the area. If a museum guest has a question about the local railroads in the area, we want to be able to accurately explain the situation.

With that in mind, here are some specific suggestions:

- Information about how the layout was built.
- Information about museum artifacts.
- Coverage of any museum activity.
- Information about ongoing improvements and maintenance.
- Museum future plans and opportunities.
- Best practices for operating on the OC&E.
- Fictional stories that explain something on the layout.
- Volunteer introductions.
- Interviews of fellow volunteers, members, or staff.
- What are those passenger cars on 6th Avenue in Greeley?
- The history of the Union Pacific lines in the Greeley area.
- The history of the Great Western Railway.
- Current operations of the local railroads.

The editor places a higher priority on material that is of a timely nature and would be the most interesting for the readership.

