ROSE CITY GARDEN RAILWAY SOCIETY

NEWSLETTER

See our Web page at http://www.rcgrs.com/

August 2004

Jeff Lange's Open House

It was a hot day on June 19th, but the food was great and the trains were running. Jeff has two layouts; a garden railway and an HO scale layout in his lower garage.

Jeff's layout, the new 'Lakeview and Boulder Railroad', has over 600 feet of track–powered mainline operation in four independent loops, and over 15 switches. His indoor track yard has five sidings and almost 100 feet of track. He can park all six trains after they have been run outdoors.

An additional loop runs along the north side of the house where Jeff often runs his circus train or the Halloween parade of decorated cars. Jeff will be hosting the annual Ghost Train Event again this year on October 16th. This event is a fantasy time when each of us can decorate a car, locomotive, or a whole train with a ghostly or Halloween theme.

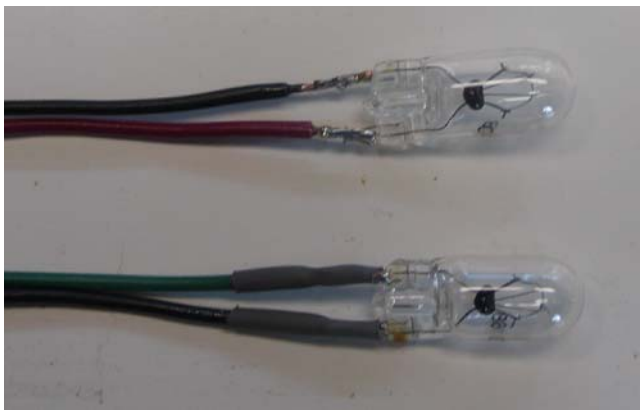
A giant railroad worker crosses his switch yard as a smaller giant, David Yager, looks on.

Lighting Your Railroad

by Allan R. Warrior

From the beginning plans for my railroad, I wanted lighted buildings. I installed conduit and some directly buried wire before laying track. However, my initial plans for lighting were possibly expensive or inconvenient. I also considered using the C9 Christmas bulbs which are inexpensive but they need 110 volts to operate; which is not considered safe for garden lighting. They are also very bright and do not give that softer glow that is wanted for most houses and buildings.

I bought some 12–volt wedge base bulbs from Wacky Willy's for 25 cents each, but I could not find suitable sockets with a pig tail on the internet or locally unless I wanted buy a case of 1,000 or some bulk number. These wedge base bulbs are the types used in automobile instrument panels and Malibu outdoor lighting sets and are not usually used in a socket with a pigtail. They have a small wire loop on each side the glass wedge base that makes the electrical contact. This wire connection does not take solder readily. I experimented and found that I could make a reasonable connection by straightening the steel wire away from the glass wedge, wrapping the 20–gage lead wires around the steel connector wire, and then soldering the joint. I then use heat shrink tubing to insulate and reinforce the connection.



These type 163 wedge base bulbs are only 25 cents each compared to the 2–watt Malibu bulbs that cost over $2.00 each. Radio Shack has type 194 wedge base bulbs for automobiles for 2/$1.59 but they do not carry sockets for them. They also carry screw base and bayonet base bulbs and sockets, but the cumulative cost is more.

I found a couple of long terminal strips at Wacky Willy's for about $1.00 that I can cut to any size I need. So far, I find that I have only needed a small terminal strip inside my power supply cabinet. Since my large railroad station is one of the primary electrical distribution centers, I may mount a terminal strip in that building. I am using small wire nuts for some of the junctions for the underground cable and spade connectors for the lights within each building. There a some places I chose not to cut the underground cable and use the Malibu compression connectors to pick off the power for a building. So far, all of my electrical connections are off the ground and hidden inside the buildings.

I also have many strings of Christmas lights from years past and I am using them as suggested in the following article. I have been using five bulbs in series for 12–volts. Being able to diffuse the lighting more evenly in a building is an advantage for this design. For a 35 light string, I get seven 12–volt light strings.

In my search for suitable sockets, I came across the Saskatoon Railroad Modellers and their advice on installing lights. I am using their advice. I have a number of small transformers from my tinplate railroad days, but after calculating how many buildings I want to illuminate, I decided to spring for the purchase of a regular Malibu 12–volt transformer with a timer.

Saskatoon Railroad Modellers

http://www.members.shaw.ca/sask.rail/index.html

Easy Lighting For Outdoor Railroads

It is dusk, the street lights are on and the windows of all the buildings glow as the people who live there go about their evening business. Here is the easy, low–cost way to make it happen on your layout.

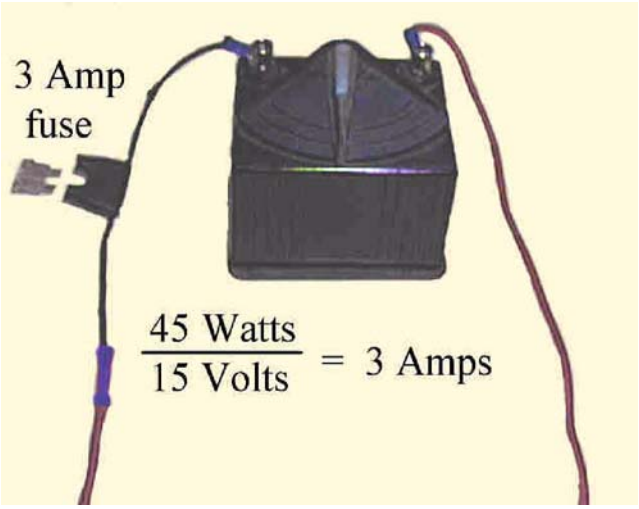
This article assumes you know little or nothing about electricity. If you already have your Ph.D. in electrical engineering, you may sit quietly while the rest of us read through it.

Low voltage is a must. All outdoor model railroad lighting should be low voltage for safety. There may be times to risk your life, but this is not one of them. Low voltage means either battery power, or normal house power stepped down to a safe voltage by means of a transformer. Twelve volts seems to be the most common voltage used, possibly because it is high enough to allow reasonably sized wires to carry enough power to be useful but still low enough to avoid electrical shock. But other voltages, up to 24 volts, are useable. Above 24 volts the wiring becomes subject to inspection (at least in Canada) which takes it out of the class of easy lighting.

Outdoor transformers. Selecting 12 volts for lighting has an added bonus. There is on the market a variety of totally enclosed, weatherproof transformers complete with timers and photocells for automatic operation. These are sold for operating low voltage garden lighting and are perfect for low voltage garden railroad lighting as well. You can even combine the two, as long as you are careful to avoid exceeding the transformer's rating. More on ratings later.

Indoor transformers require fuses. If you prefer, you can run your lights from an old Lionel or Marx 0–27 gauge transformer. However, these are NOT weatherproof and are suitable for indoor operation only. Indoor operation of the transformer that is. Wiring can be safely run from a transformer kept indoors to lights which are outdoors. But for safety sake, an inline fuse equal to the transformers current rating is a must. It should be connected in series with the transformer output right at the transformer.

The 3 Amp fuse connected to the transformer in the following photo is a blade type automotive fuse. Tubular fuses are fine as well. The fuse is in series with one of the red wires going to the lights. Series means all the electricity must flow through the fuse on its way to the lights; there is no alternate path. Note that the cord that carries house power to the transformer is not seen in this photo. With the speed control set just past half way, this Lionel transformer produces 12 volts.



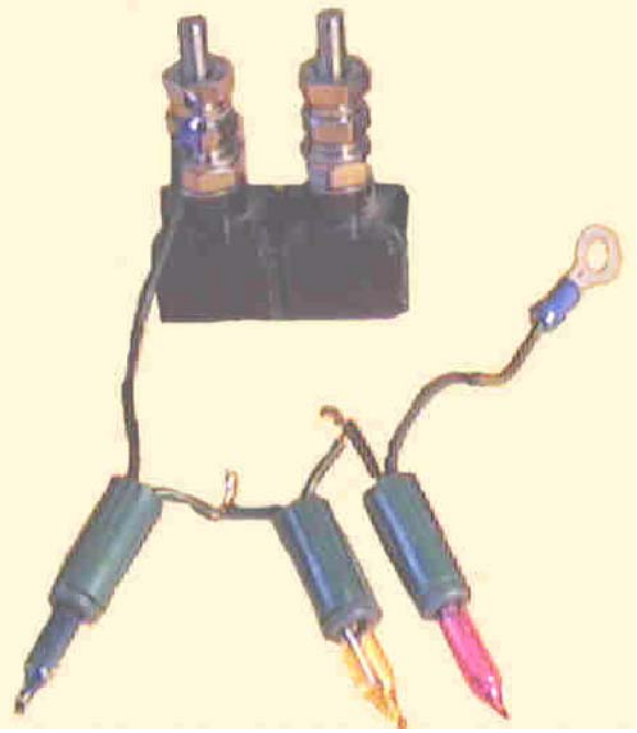
You can calculate the current rating for the transformer and for the fuse by dividing the power rating of the transformer by the voltage. The power rating may be in Watts or in Volt Amperes. For example, my old Lionel transformer in the photo is rated at 45 watts, 8 to 15 Volts. A suitable fuse would be 45/15 = 3 Amps. By choosing the maximum output voltage I got a conservative fuse rating. You could set this transformer at 11.25 volts and use a 4 Amp fuse, but if someday you accidentally turned it up to full voltage, it would be over fused by 33%. I prefer not to take that chance. Speaking of chances, your transformer may have a circuit breaker or an "overload reset" button. Would I take a chance on an old circuit breaker in place of a fuse? Would I risk my $100,000+ house for the sake of a $1 fuse? Not a chance!

Choosing lights. Twelve volt circuits mean twelve volts lights, right? Well, that is a definite maybe. Twelve volt automotive dash lamps are a possibility, especially when you want a few bright lights, and you can accept a limited life. Type #194 (wedge base) is rated 3 watts, 2500 hours life. If you want to use sockets, #52 (miniature screw base) and #53 (miniature bayonet base) are 3/8" round bulbs rated 1.5 watts, 1000 hours and #1487 (miniature screw base) and #1815 (miniature bayonet base) are 3/8" tubular bulbs rated 2.5 watts, 3000 hours. These lamps are all available at Radio Shack for about a dollar each (that's a Canadian Loonie, folks.) Screw and bayonet sockets for these lights run about 50 cents each. Alternately, Christmas lights can be used. Twelve volt Christmas lights are no longer manufactured, but 6 volt and 3.5 volt ones are. These can be strung in series across 12 volts in various ways to achieve various effects. For example if you connect two identical 6 volt lights in series across 12 volts, each lamp will receive 6 volts, its full rated voltage. At this voltage, it will glow brightly and last about 1000 hours. But if you connect three in series to make a sort of mini string, and connect that string across 12 volts, each bulb will receive only 4 volts, and some marvelous things will happen. Firstly, the glow will be softer and more yellow, which tends to look better, particularly in older style buildings. Secondly, we will have extra lights that we can position at different points inside the building for more even lighting without drawing any more current from our transformer. And thirdly, the lights will last a very long time, about 22 years if you leave them on night and day. Not bad for lights that cost as little as a dime apiece, including sockets (strings of 20 sell for about $2 at Christmas – lay in a stock when they are available.) The 3.5 volt Christmas bulbs are similar except that they are sold in strings of 35 lights or sometimes 100 lights. They can be connected in strings of 4 or 5 across 12 volts for more light or softer light/longer life. Because a string of four 6 volt lights draws only about 1.5 watts and a string of five 3.5 volt lights draws only about 2 watts, many strings may be connected in parallel across your transformer.

Series connections in parallel??!!! Yes. You probably do it every Christmas without thinking about it if you put several strings of mini lights on your tree. Each string of lights is wired in series. That is, the electricity must go through each bulb in turn to get from one end of the string to the other. There is just one path for the electricity. That is why they all go out if you pull out just one bulb. But when you plug all the strings into the wall, the strings are connected in parallel. That is, each string is an alternate path for the electricity to flow and interrupting one path does not affect the other paths.

At the top of the following photo is a terminal block with two terminals. It is convenient to have one in each building or each group of buildings. This particular block was made using 1/4 inch stainless steel bolts with 3 stainless steel nuts on each bolt. The first nuts hold the bolts in the insulating block. The second nuts hold the two wires from the transformer, one on each bolt. Actually, the wires may not come directly from the transformer, they may come from another block just like this one but located

closer to the transformer. The second nuts may also hold two other wires, one on each bolt, that go to another block just like this one but located farther away from the transformer. The top nuts hold the two wires coming from the lights in the building, one to each bolt. The left hand wire is already connected to the left hand bolt but the right hand wire has been left off to show the crimp–on terminal lug which is used to keep all the strands in the wire together and under control. These lugs are not absolutely necessary, but do make a neater, more reliable job of it. The two wires for the lights in a nearby building could also be held under the top nuts, to save on terminal strips. The terminal strips can be hidden inside buildings or in a pinch, buried in plastic bags. Note – the bulbs in the photo just happen to be coloured ones. Before using them, the coloured lacquer can be removed by scraping it with a knife or by washing it off with lacquer thinner.



Outdoor connections. In the photo above, the ends of the wires between the light sockets have been stripped bare of insulation for about 1/2 inch, and the bare copper strands twisted together. This is ok for testing the lighting to be sure it works, but it will not last for long. To make a lasting joint, the wires need to be soldered and wrapped with electrical tape. For best results, terminal lugs should also be soldered after they are crimped on, especially if you are going to bury them. Another trick that will help if you bury your terminal blocks is to sparingly coat both sides of the lugs and nuts with silicone grease (sold at automotive stores for greasing spark plugs.)

Ratings, rantings, and ravings. It is important to not exceed the power rating of your lighting transformer. They don't like it and you won't like it either if you have to replace a burned out one. My lighting transformer, bought with a set of lights, is rated at 50 watts, which seems to be pretty typical. That means all the lights that I connect to it cannot exceed a total of 50 watts. It was purchased as part of a set that included 12 "moon lights" rated at 4 watts each. Not much extra for running building lights. But nobody said I had to connect all those moon lights. So I used 6 of them which totaled 24 watts, leaving 26 watts for buildings. Now as it happens, I really like the mini strings of Christmas lights and at the moment have 10 of them installed. That is about 20 watts. So I have only 6 watts left. But this summer I want to add four street lights using pairs of 6 volt Christmas tree lights, and put lights in another building. That will be 10 more watts. Well, I could uninstall one moon light and just make it, or I could replace the original 4 watt #918 bulbs in the moon lights with 3 watt # 194 bulbs and make it with a couple of watts to spare. Better yet, I could buy another lighting transformer and be done with it.

Epilogue. Ever wonder why they quit making 12 volt Christmas lights? Or are you even old enough to remember those cone shaped lights with the little red beads on the sockets for holding them onto the branches? Originally, they were sold 10 in a string, and the bulbs would last perhaps 1000 hours before you had to work your way along the string, unscrewing bulbs and screwing in spares until you found the one that had burned out. The math worked. 120 volts divided by 10 bulbs was 12 volts. Well and good. But then the manufacturers started putting eight in a string. Made them more profit, I suppose. But the math wasn't quite so good. 120 volts divided by 8 bulbs was 15 volts per bulb and the life dropped to about 55 hours. Then they got really greedy and went to 7 in a string, a little over 17 volts per bulb, and a life of about 10 hours. By now you were spending more time looking for dead

bulbs than sitting admiring your tree. Everybody quit buying that type of light. I wonder why.

For the technically minded who are wondering about those estimates of bulb life, Spectrol advised some years ago that the life for small lamps varied inversely as the 13th power of the voltage ratio. This means that if we operate a bulb at 2/3 of its rated voltage, it will last 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5 x 1.5x 1.5 = 195 times as long.

If the bulb lasts about 1000 hours at its rated voltage, it will last 195,000 hours at 2/3 its rated voltage. This is about 22 years of continuous operation. But what about light output? That varies directly as the 9th power of the voltage ratio. So in the above example, the light output drops to 2/3 x 2/3 x 2/3 x 2/3 x 2/3 x 2/3 x 2/3 x 2/3 x 2/3 = .026 times rated output.

The light output has dropped to only 2.6 % of its rated value. But hang on, it doesn't look that dim. That is because our eye is roughly logarithmic which means the light level has to drop to 10% to look half as bright. So in the above case, the light appears to drop only to about 33% of its original brightness, not to 2.6%.

Did You Know?

Did you know that the Union Pacific Railroad is the only railroad in the United States that has retained the same name from its inception? Did you know that the Union Pacific is now charging a royalty to model makers for the use of its corporate name and logo on models?

Schedules & Timetables

Be sure to check the RCGRS Website for any updates or changes. http://www.rcgrs.com

Anyone interested in having an Open House, please contact Darrel Dunham, 503–697–4738
ddunham100@aol.com

NOTE: Member Jan Zweerts is committed to the Lewis & Clark Explorer Train on weekends and can not attend most club functions. Jan would like to attend an operating session in mid–week if he is available. He can be called at 503–247–7531.

July 31st, Saturday, 10:00 a.m. to 4:00 p.m.: The OGB RR at Glenda Bockel's. 16103 Lake Forrest Blvd., Lake Oswego, OR. 503–636–1740. We have added some new industries and now have over 150 structures.

July 31st, Saturday, 5:00 p.m.: Steve and Mimi Cogswell. "We moved to a 4.5 acre 'farmette' near Oregon City just before the end of tax season. We're still getting settled in, but would like to invite you to an Open House starting at 5:00 p.m. There is no railroad yet, but we have hopes and dreams.

Burgers and hot dogs will be provided on the barbie, but feel free to bring along your favorite potluck dish and beverage. Our blender will be at your disposal, as long as we get a taste!" Our new address and phone are: Steve and Mimi Cogswell, 17520 S. Holly Lane, Oregon City, OR 97045
Phone: 503–650–4682

Directions: Get on I–205 and take the Hwy 213 Park Place/Molalla exit (exit 10). Turn east (toward Mt Hood) from the exit. Go a long block in the right lane to just past Home Depot.

Turn right on Redland Road. Go about 1/2 mile and turn right on Holly Lane and cross the bridge over Abernathy Creek. Continue about 1/4 mile.

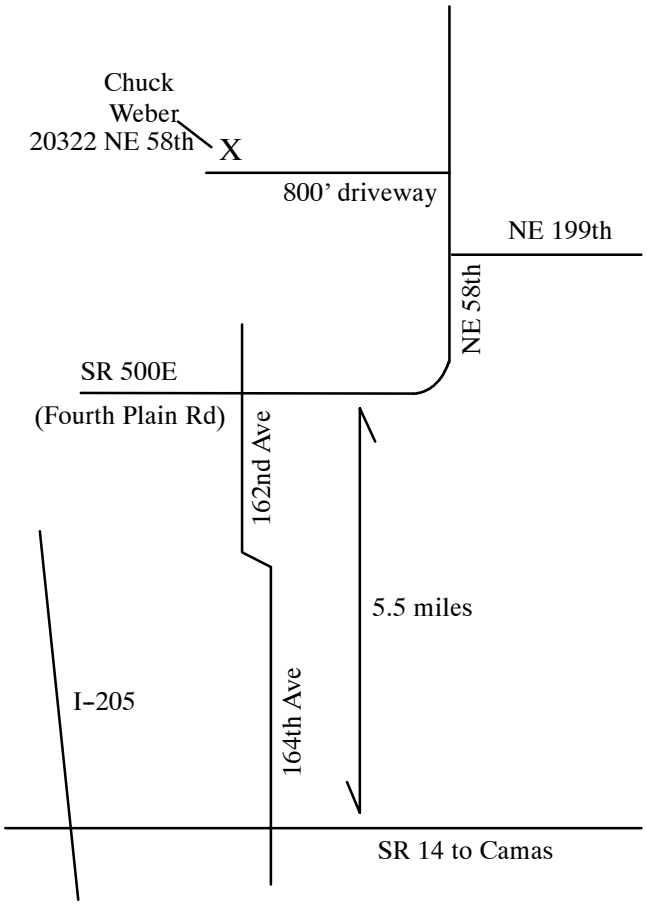
When you pass a sign for Ogden Middle School, count 3 telephone poles on your left to our mail boxes. Our neighbor's mailbox is marked GATES (yes, his name is Bill Gates!) Follow this driveway to it's end. We're the house on the right. **PLEASE R.S.V.P. by Friday the 30th so we know how many burgers and dogs to get.** Looking forward to seeing you! Steve and Mimi

August 12–15, Denver, Colorado: 20th Annual Garden Railway Convention

August 14th, Saturday, 10:00 a.m. to 4:00 p.m.: The Old Homestead Logging RR at Bob & Sharon Yankee's. 16323 South Windy City Road, Mulino, OR. 503–632–3555. More track work and new structures including the Arrowhead Mill complex.

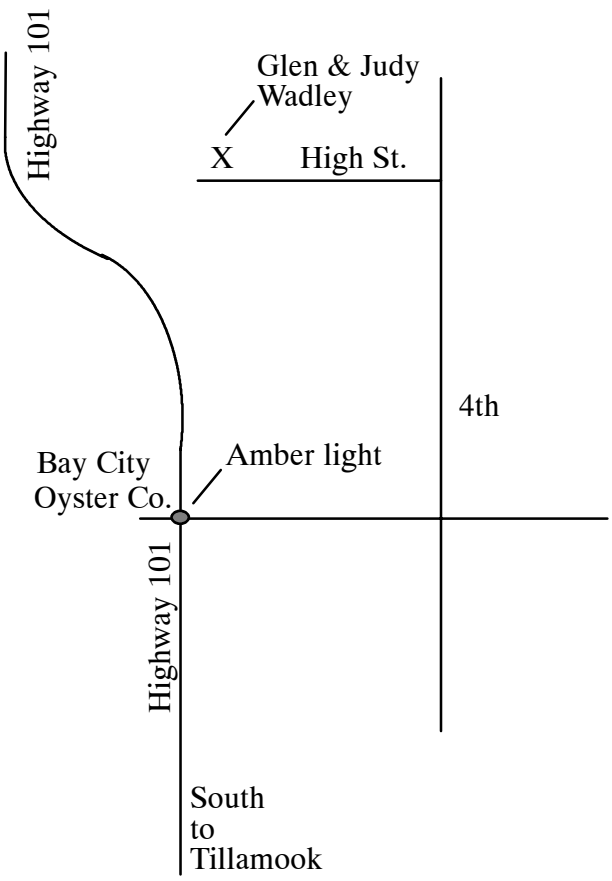
August 21, Saturday, 1:00 to 5:00 p.m.: Chuck Weber, 20322 NE 58th St, Vancouver, WA 360–256–4335. This is our Annual Auction and Quarterly Business Meeting. Start rounding things you

want to have auctioned off. Now is the time. Also a good time to see who will bid against themselves. There will also be lots of time to run trains. Chuck has a wonderful layout. Track power, battery as well as steam. Potluck: Club will provide the Hamburgers, Dennis will cook. A–M bring a salad, N–Z bring a dessert.



August 28th, Saturday, 1:00 p.m. – 5:00 p.m.: Glen & Judy Wadley, 5170 High St, Bay City, OR 503–377–2685 Let's all head for the coast this weekend to see and play with Glen's fine layout. We all had a great time last year. Weather was great. Track power, so bring your electric and steam powered engines. Potluck: Judy is supplying the main dish, A – M bring a salad, N–Z bring a dessert.

See Map. Turn right from Hwy. 101 at the amber light. Turn left on 4th St. (first intersection). Go to top of 4th St. Turn left on High St. (The High St. sign is always missing because the kids like to steal it. If you get to the stop sign at the end of 4th St., you've gone too far.) Go to the top of High St. Look for the brown house on the right with the ponds and the railroad. Hope to see everyone there.



September 12, Sunday, 2:00 to 6:00 p.m.: Richard & Penny Walker, 12040 SW Douglas St., Portland, OR 503–464–6671. Track laying party. Another great time to help out fellow members with their layout. Bring your trains. The goal is to run them before we leave. Penny will also be having a BBQ with rhubarb pie.

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