Tucson Garden Railway Society's

Time Table

Society web site: http://tgrs.homestead.com
Editor e-mail: dizen@aol.com

August 2003

Meeting This Month

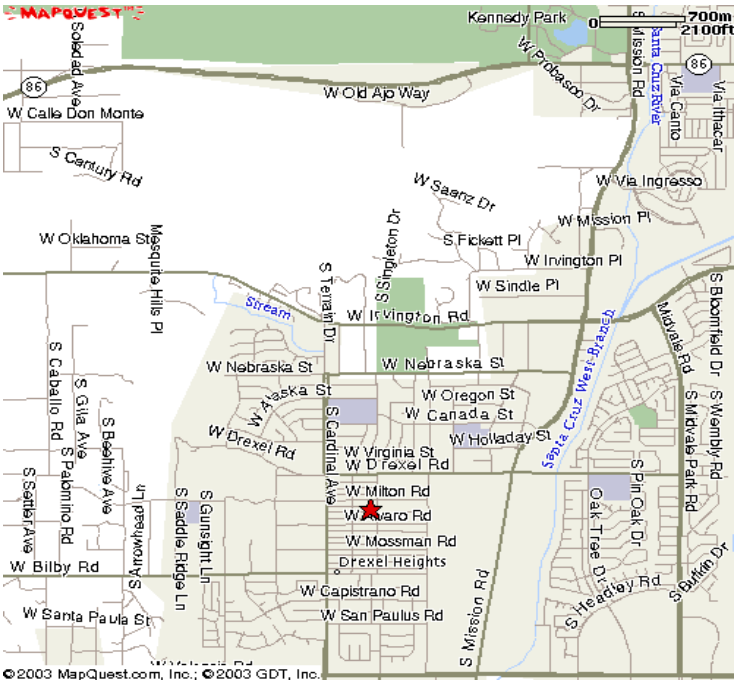
This month's meeting will be on August 16 at 10:00 AM at:

George and Kathy Fitzner
2722 West Dove Road
Tucson, AZ 85746

Phone: 578-0064

Directions:

Take Golf Links or I-19 to Irvington Road. Turn right (west) on Irvington and proceed to Mission road. Turn left onto Mission and proceed to Drexel Road. Turn Right on Drexel and proceed two blocks (on left) to Hildreth. Turn Left onto Hildreth and go 3 blocks to Dove Road. Turn Right on Dove road and look for address. Please remember to bring your own chairs.



The Railroad

This months meeting will feature the Fitzner's extensive collection of LGB rolling stock and their unusual indoor European themed railroad. . George has been an LGB enthusiast almost since the beginning in 1982.

He has a European village featuring a hand painted mural on the "storage room" wall and about 150 feet of track.

Most of the rolling stock is LGB including an "Orient Express" european passenger train powered by a blue

articulated and both Unintah and Sumpter Valley articulated locomotives. U.S. passenger trains are represented by a Santa Fe streamlined train pulled by multiple 'war bonnet' F units. Most of the buildings are Pola and Piko kits he has built but the placement of the people are courtesy of Kathy who styles herself Chief Snoopervisor.

Kathy has been after George to construct an outdoor layout based on a US theme and insists that part of the backyard is the site of the invisible Western village.

TGRS Dues were due in June

The clubs fiscal year ended at the end of June and next year's dues are now past due. For those of you who don't read the boilerplate on the last page, dues are $30 per year. You can send your dues (Make checks payable to TGRS) to Treasurer Willis Fagg at:

Willis Fagg
12440 East Ave. de la Vista Verde
Tucson AZ 85749

TGRS BOD Meeting

The next TGRS BOD meeting has been rescheduled to 7:30 PM on August 18th at Willis and Dottie Fagg's house, 12440 East Ave. de la Vista Verde. While I don't know why you would want to spend a perfectly good Monday evening in a meeting, as with all of your club's Board meetings, members are welcome to attend.

To get to the Fagg's go east on Tanque Verde about 2.4 miles past Houghton and look for the School Crossing sign at Fenimore. Turn left (north) on Fenimore. Follow Fenimore to the second right which is Ave de la Vista Verde. Look for 12440 on the inside of the curve.

Editor's Rants

A number of members now have digital cameras and bring them to the meetings to take pictures of the various layouts. I urge you to e-mail copies of your pictures to Jerry Tulino so that he can post them on our web site. The same is true of any pictures you take at displays and events. It is a great way to build the TGRS photo library and to share with your fellow club members. Jerry's e-mail address is tgrsemail@yahoo.com.

Using LEDs for Train Lighting Part 2

By Nick Buchholz

As you remember in part I, we explained how to put an LED head or taillight in an engine already equipped with constant voltage directional lighting. This time we are going to discuss how to do the same thing to engines not so equipped.

Lets review the possibilities. Once we have eliminated the constant voltage case, the engine may be equipped with direct track power or with proportional track power (I called it "track power with a voltage divider" in the last article.) Either of these may have directional lighting. So how do we tell?

First, if the engine has directional lighting the test table we filled out in the first part will have voltages in the forward column and near zero in the reverse column, (vice versa if you connected to the taillight.) The values of the voltages in the table will tell us which type i.e. direct or proportional we have.

Review Table 1 and Table 2 below:
Table 1 is an example of what a direct track power engine with directional lighting would look like. Without directional lighting the reverse numbers will have the same magnitude but be the opposite sign from the forward numbers, i.e. –2.4v instead of 2.4v.

Controller Setting		Measured voltage	
Percent	Voltage	Forward	Reverse
10%	2.4	2.4	0.0
25%	6.0	6.0	0.0
50%	12.0	12.0	0.0
75%	18.0	18.0	0.0
100%	24.0	24.0	0.0

Table 1

Table 2 is an example of what a proportional track power engine without directional lighting would look like. Again with directional lighting one of the columns would have zero or near zero voltages.

Controller Setting		Measured voltage	
Percent	Voltage	Forward	Reverse
10%	2.4	1.2	-1.2
25%	6.0	3.0	-3.0
50%	12.0	6.0	-6.0
75%	18.0	9.0	-9.0
100%	24.0	12.0	-12.0

Table 2

A Few Notes

First, it is unlikely the actual numbers you have in the table will look exactly like the tables above. There will be small differences. Round to the nearest tenth of a volt. The values may vary above or below the theoretical value by as much as a volt. Our calculations will try to take into account these variations

Second, The circuit we will install in the engines will be the same for all the cases listed. However the values of the components will change depending on the values in the tables.

About circuit components

All circuit components have two important ratings that need to be determined. The first is the value of the component. These values are measured different ways for different components the Table below gives the value units for different components.

Component Type	Value Measured	Primary Units	Power Unit
Resistor	Resistance	Ohms	Watts
Capacitor	Capacitance	microfarads	Volts
Diode	Rev. Bias Volts	volts	Watts & volts
Regulators	Supplied voltage	volts	Watts
Battery	Supplied voltage	volts	mAHr

The second component value that needs to be determined is the power handling ability of the component. This power handling ability is measured in watts or volts and the value required for a particular component is calculated from Ohms law just like the resistance is calculated. We've already seen an example of this in the first part when we chose a 150-Ohm ¼ **Watt** resistor. To determine the power rating of the component use Equation 2 below.

The power required by a component is given by

$$P = I_c \times I_c \times R_c \qquad \text{Equation 2a}$$

For many solid-state components we don't have a good handle on R_c so we use a slightly different but equivalent formula:

$$P = I_c \times V_c \qquad \text{Equation 2b}$$

P is the power handling capability of the component
$\mathbf{I_c}$ is the current through the component
$\mathbf{R_c}$ is the resistance of the component
$\mathbf{V_c}$ is the voltage drop across the component

Equation 2

So for our resistor above, if you remember we had a current of .02 amps and a resistance of 150 Ohms

.02 x .02 x 150 = .06 Watts

which is much smaller than the ¼ Watt we chose, however, a .06-watt resistor would be nearly impossible to see, so we fudge. You usually can substitute a component of larger wattage but with the same value without changing the circuit behavior.

The Circuit

The circuit diagram below in Figure 1 gives the connections needed to create a directional constant voltage lighting source using an LED the unconnected wires on the left marked **+** and **-** are where we connect to the old power circuit. The components labeled C1, R1, D1, D2, and U1 will be connected on a little circuit board called a PERF board used for prototyping circuits. The LED will be connected to two wires to allow it to be installed in place of the old lamp.

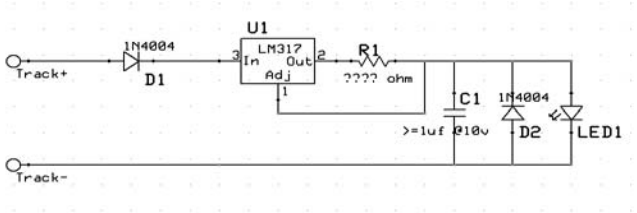


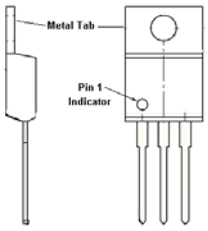
Figure 1

This circuit is a little more complex than the previous one and works like this, the diode D1 prevents anything from happening if the polarity is reversed. This gives us the directional part of the circuit. U1 is a voltage regulator and when connected with R1 in this way creates a constant current source. (In this case producing 10-50 mA). C1 and D2 make sure the LED doesn't flicker if we lose track power and protect the LED from reverse voltage spikes. The LED produces the light. We don't need the series resistor to limit the current in this circuit because the U1/R1 circuit only produces the required current and cannot produce more. Note: that this circuit will actually run several LEDs in series.

Determining Component Values

The component values for this circuit are determined by the requirements of the voltage regulator.

U1 – an LM317 voltage regulator get the 1 Watt version in the T220 package it looks like this:
We will use it standing upright as it is on the right. The photo of the Circuit shows the part from the top.



C1 – use a 10-volt capacitor, with the biggest capacitance possible, at least 20 microfarad, If the cap is polarized, (usually marked with a + near one lead), be sure to connect the plus to the plus of the LED and U1

D1, D2 – use a 1 watt, 1N4004 or 1N4007 diode. Diodes are usually marked with a line or bar on one end. This is the cathode (negative) terminal on the diode.

R1 will take some calculation. LEDs can generally handle between 10 mA and 30 mA, with 10 being pretty dim and 30 being really bright. Determine the requirements of your LED if it is special. Choose a value and look up the resistor value on table 3 below:

Current Desired (mA)	10	12	14	16	18	20	22	24	26	28	30	32
Resistance Required	125	104	89	78	69	63	57	52	48	45	42	39

Table 3

For your information the formula to determine the current output of the regulator is

$$I_{out} = 1.25 / R1$$

Not every resistance value will be available pick one within a few Ohms, but less than the value calculated from the

Table. Once you try out the circuit you may want a slightly brighter or dimmer look to the LED, simply change the value up or down until you're happy.

Now we have to build the circuit to do this you should get a piece of PERF board about .75x1.5 inches. PERF board is a circuit board drilled every .1 inches and about 0.0625 inches thick. You can buy small boards at Radio shack. Figure 8 below gives a possible layout for the circuit we want to build. The blue things are the components and the red lines are the wires connecting them. A connection is made wherever there is a black dot inside a red circle. Of course the LED will not be directly connected to the board but will be connected on wires

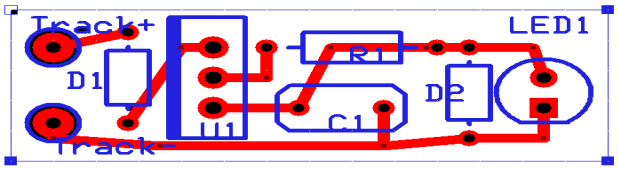


Figure 2

Since this can get a little complicated I've included a picture of the front of the circuit after it's completed. Figure 3 is the front of the Circuit Board

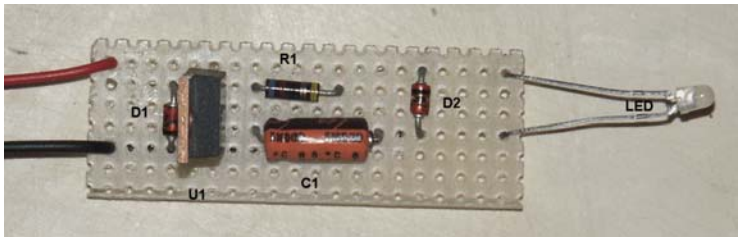


Figure 3

Figure 4 is the top of the circuit board with the wires connecting components drawn in as white lines.

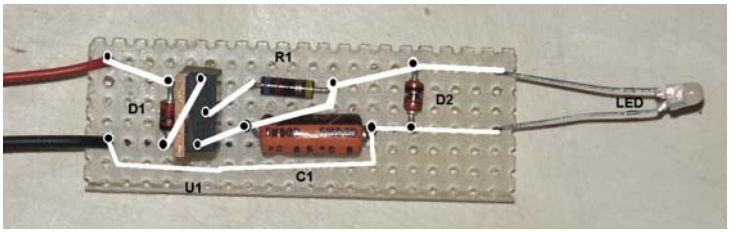
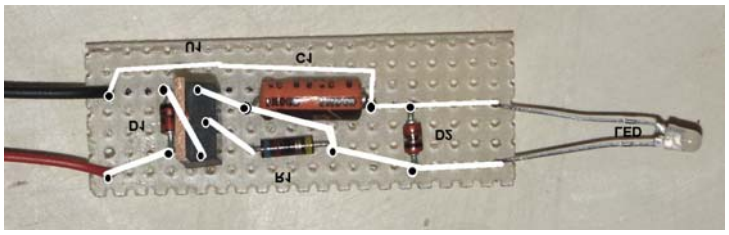


Figure 4

These white line connections are actually made on the back of the circuit board and when viewed from the bottom of the board will look like **Figure 5 (below).**



I used a trick to give you X-Ray vision so you could see the components and the wires, normally only the wires would be visible in this view from the bottom of the board.

I THINK I KNEW THAT! #7

BY ROY EBERBACH

This column presents my ideas and is not intended as the only way or the right way of doing things. This is what works for me. If you have different ideas that work for you send them along and I will share them with the club.

#7-1. How do you take apart USA diesels to install a sound unit?

Like many of you I have several USA diesel locomotives in my collection. When I got my first unit I tried to take it apart to install a sound unit. It was no problem to take off the fuel tank which is where the speaker goes, but I could not figure out a way to free the body from the chassis of the diesel. Finally I called USA (Charles Ro) and spoke to a tech. The trick is to buy a very long skinny flat screw driver. The one that I ended up with after trying several is an Xcelite R188 (made in USA). The blade and shaft are 3/32" and the shaft is 8 and 1/4" long. The diesels vary in the number of screws which must be removed from eight to fourteen. Some of the screws are hidden under the trucks and fuel tank. Of course the screws come in a variety of sizes. To help keep things straight on the workbench I use a magnetic dish to hold the screws that I have removed. I place them in the dish in order and the magnetic base holds them in place for reassembling. The screw driver came from Ace and the dish from Harbor Freight. Never try to force the body off the chassis. If it does not wish to come apart you have missed one or more screws.

#7-2. Why do you replace the plastic wheels that come on your rolling stock with metal wheels?

Many cars now being produced come with metal wheels while older ones have plastic wheels. As a matter of course I have always replaced the plastic wheels with metal ones. There are several reasons for this. First the metal wheels add weight to the car and they lower the center of gravity of the car. Both of these effects help the car stay on the rails better. The wheels that I use come from San-Val and are easily adjusted to make them the proper width which helps them track through switches and tight curves. The wheels are insulated one from the other so I can use them to pick up track power. This electricity can be used for lights on the car or other accessories. Also I can route electricity to the engine if it needs additional pick ups to run smoothly. This is often true with small 4 wheel locomotives or even Bachman 10 wheelers. Lastly the metal wheels do not pick up and redistribute the dirt off the rails as do plastic wheels. There are several brands of metal wheels which can be found in Garden Railways Magazine.

#7-3. How do you keep dirt from splashing up on your buildings when it rains?

Does it rain in Tucson? Well when it does, it is hard to keep all the dirt from getting up on our scenery. One thing that we can do is to spray the areas along our tracks and

around our buildings with a mixture of glue and water. Thanks to Gary Martin, after I complete a section of track and apply ballast to it, I cover the area with a mixture of 50% TITEBOND II wood glue and 50% wet water. Wet water is made by adding 3 or 4 drops of dish washing detergent to a quart of tap water. Mix this combination well and dribble it over the ballast. Try not to get it on the railheads as it will affect electrical pick up. If you do get some on the rails wipe it off and later clean the rails with an abrasive pad.

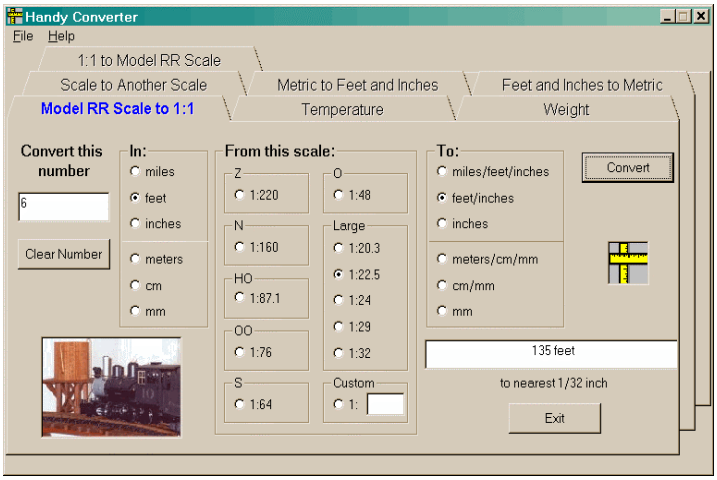
Back to our buildings, make up a similar solution using 60% wet water and 40% Titebond II. After you have mounted your building to its base sprinkle dirt from the surrounding area on the base. Then spray the solution that you have made (above) gently on the dirt that is adjacent to the building. After it dries it will help keep the dirt where it belongs and off your building.
If after a rain you find dirt on the sides of your building, spray gently with plain wet water to clean the building and then repeat the treatment of Titebond II and wet water. About once a year as part of our on-going maintenance, I try to treat the ballasted areas and the areas around buildings with the above solutions.

Rail Bits # 5

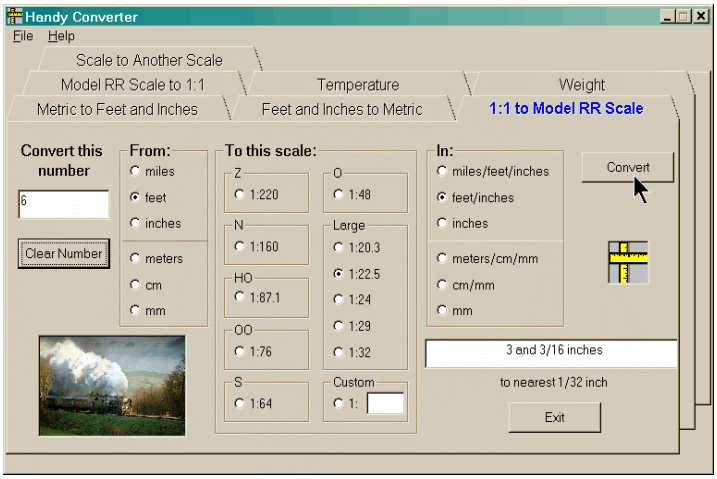
(A stopover at the Digital Station) by Jerry Tulino

"Handy Converter" - a useful utility and a Scale and Gauge Chart

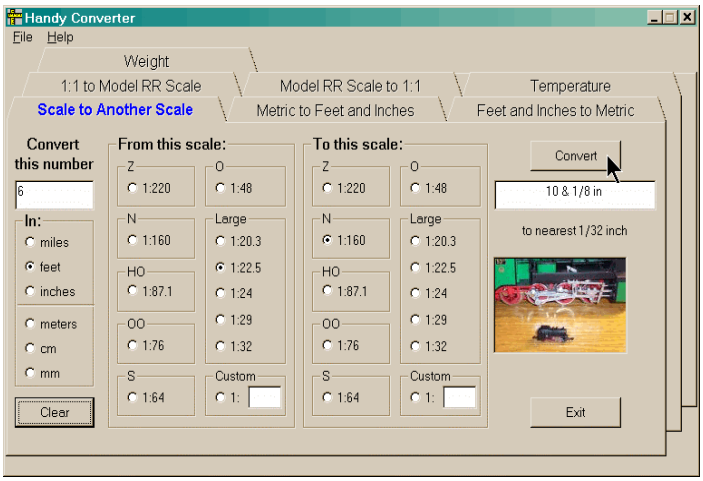
I found (on the web site of the Greater Vancouver Garden Railway Club) a very useful utility (sorry, Windows only, no Mac version available). It is called "Handy Converter". It performs many of the "normal" conversions such as feet and inches to metric, pounds and ounces to kilograms and grams and the converse of them. However it also performs conversions that are of interest to many of us such as model railroad scale to 1:1. For instance, it will convert 6 feet in 1:22.5 scale to 135 feet in "real" scale (see the following screen…



Or how about converting 6 feet in "real" scale to 1:22.5…



And, finally, you can convert 6 feet in 1:22.5 scale to it's equivalent in N scale (or HO, etc.)…



And, for all the AWNUTS folks, just continue what you are doing, because you still create wonderful and interesting layouts in whatever scale your latest addition represents.

I have added a new menu item to the TGRS web site called "Downloads". You can go there to download this utility and then install it on your own PC.

Also on the download page is a link to Garden Railway Magazine's Scale and Gauge chart. This is a "pdf" document. If you "left click" on the link, the Adobe reader will load and display it (just like it does for the newsletters). You can print it if you want to keep a "hard copy". If you do a "right click" on the link, it will allow you to download the document to your PC.

Minutes of Last Meeting

Hosts: Norm & Ibby Ulmer
June 21, 2003 Attendance 47

Pres. Norm Buchholz called the meeting to order and thanked the Ulmers's for hosting. New members and guests were introduced.

The minutes of the last meeting were approved as written in the newsletter.

Willis Fagg reported a balance of $ 2,810.65 in our checking account; also that it is time to pay our yearly dues. The home show raffle netted a profit of $ 278.00 after the cost of the prize.

Norm Ulmer reported that the TCC layout was our biggest ever and it was profitable. TTOM donated $20.00 to us for our continued support. Our Children's Layout was set up at their June Swap Meet at the Rodeway Inn and was enjoyed by all.

Committee Reports: Name tags were available from Ibby Ulmer, for new members.

Joe Stoesser reported the Mentor Program is going well.

Nick said" the permanent layout is on hold for the summer".

Joe Duda reported the new switches were doing the job. The Module Committee is checking on installing shut-downs before the gate to prevent accidents and also going to look into getting a movable guard rail as protection for the layout.

The Education Committee is on hold until September, per Janet Mitchell, also they would like to have more people to join the committee.

Old Business: If a Public Pay Round-a-Bout is held, could the money maybe be used to buy another trailer?
A bus trip to go to Phoenix for a round-a-bout and dinner in November was passed by the members.

New Business: A Board Meeting will be held at Willis Fagg's house on August 18, 2003 at 7:00P.M.

The Pres. and several members will meet with TBG on July 8, 2003 to discuss a layout for Christmas at TGB. Discussed will be, a volunteer and a TGRS work together on the same shift, that we would be there for a shorter time, also the shifts would be less hours.

A new position, (Publicity Person) needs to be filled. The job calls for contact with TV, radio, Railway Gardens, etc.

For Sale: Chuck Cook and Gary Martin had several cars and engines for purchase.

Show and Tell: The show and tell table was full with new buildings by Joe Duda, Jane Dorgan, and Gary Martin. There was a turntable made by Norm and lots of people and animals that were made by Jane.

The meeting was adjourned.

The nest meeting will be held at George & Kathy Fitzner's, August 16, at 10.00 A.M.
Respectfully submitted by Ellen Stoesser

2003 Convention

The TGRS was well represented at the Garden Railway Convention in Sacramento. We had over 15 couples at the convention for various lengths of time. In attendance were the Andersons, Blackwells, Cooks, Dorgans, Dudas, Faggs, Harts, Hoffmans, Izens, Lathrems, Martins, Mitchells, Moselys, Shivacks and Ulmers. The over 15 couples? Steve Anderson was also at the convention. We all got together for dinner Friday and traded experiences and tips as well as some good fellowship. I was particularly pleased to see that Ginny Anderson made the trip.

Gary Martin checks out a beautiful (but larger than G gauge) ride on steam engine under construction. This was at Matthew and Vanessa Mason's home/

The convention itself featured 48 different layouts though some were only available to those who drove in or out at the beginning and end of the convention. Even though Jeanne and I flew to Sacramento we managed to see 30 layouts ranging from interesting to impressive and some that were really great. There were 19 clinics spread over three days, a swap meet and 52 vendors spread over two exhibit halls.

Operating lift bridge rising on Jim Daly's DGNNRR. Jim scratch built this and many other bridges.

Of course, there was the traditional ice cream social, an outdoor barbecue and a banquet. The banquet was

entertained by a slide show of the layouts and a banjo band while the barbecue was in a park where the Sacramento Valley Live Steamers provided rides for all who wished.

The water feature on the beautiful estate of Alice Epperson's LGE Railway is so large it has remote control (scale) boats and a full size rowboat.

While that is a pretty impressive round up there was also the California State Railway Museum in old Sacramento. Not only did they have their usual displays of equipment (an A/B set of Santa Fe war bonnet F units, a rare 4-2-4, several 4-4-0s, a SP 4-8-8-2 Cab Forward, various RPO, Dining, Coach, Parlor and Private cars) but they also had special exhibits of drumheads and toy trains. Also in the museum, the Del Oro Pacific club had set up their modular layout with some pretty amazing scenery that included lights, sounds and quite a bit of animation.

Mine and Stamping mill on Mike and Cathy Falkenstein's Misty Ridge Railroad

By the way, for those of you who missed the convention, or those who attended but didn't get enough pictures, Willis Fagg has a great site with the pictures he took of just about every open layout. You can find it at http://www.km6mv.org/trains/convention/index.html

I think everyone who attended had a great time and judging from the number of photos I saw being taken, I am sure there were a number of new projects inspired. If you missed this one (or even if you attended this one) be certain to join us in attending the next convention in Denver.

Note the nice building flats against the fence on Paul and Carolyn Smith's Smitties Shortline.

Icing facility on the DeLucia family's beautiful Sierra Nevada Northern Railway

Jeanne Izen ducks under the 5'5" clearance of the arch bridge on Bob and Mary Dean's Deadwood, Eureka & Northern Railway.

Anonymous Submission

The following item was submitted anonymously and is presented un-edited.

Sage advice from the Old Model Railroader
When cutting wood on a table saw always count your fingers before throwing out the sawdust

* *

Condolences

I have just learned that TGRS member Duane Goralski passed away on Monday the 21st of July after loosing his battle with cancer. Please join the club in expressing our condolences to his widow Georgianne.

* *

The Tucson Garden Railway Society is a non-profit corporation incorporated in Pima County, Arizona. Society members are interested in all areas of garden and modular large scale model railroading. We welcome new members and hope you will consider joining. Members help each other build layouts and learn about railroading and modeling.

The TGRS dues are $30.00 per year and are due on June 30th of each year. For new members dues are pro-rated at $2.50 per month remaining in the year until June 30th plus a $15.00 initiation fee, the first year. Additional name badges cost $1.00 for each badge after the first.

If you are interested in the TGRS please contact one of the officers at the phone number listed in the Calendar section below. If you wish to join immediately, send a check and your name, address and telephone number and the names for any additional badges to:

Ibby Ulmer
4935 N. Craycroft Road
Tucson, AZ 85718

Calendar of Events

August 16	**Meeting at George & Kathy Fitzner's home 10:00 AM**
August 18	**BOD meeting at Willis & Dottie Fagg's home 7:30 PM**
Sept 20	**Meeting at Jay & Sallie Sanders' home 10:00 AM**
Oct 25	**Meeting at Neal & Winnie Mosely's home 1:00 PM (evening showing 7:00 PM)**
Early Nov	**Roundabout in Phoenix (Date to come)**
Nov 15	**Meeting at Ken & Mary Karrels' home 1:00 PM**
Nov-Dec	**Tucson Botanic Garden holiday layout (?)**
Dec	**Meeting and Holiday lunch at Roy & Mary Ann Eberbach's home**

President:……	Nick Buchholz	520-744-4932
V-President:……	Norm Ulmer	520-299-9401
Secretary:……	Ellen Stoesser	520-577-1210
Treasurer:……	Willis Fagg	520-760-0147
Editor:……	Dick Izen	520-498-4634

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