



# Tucson Garden Railway Society's

## Time Table

Society web site: <http://tucsongrs.org>

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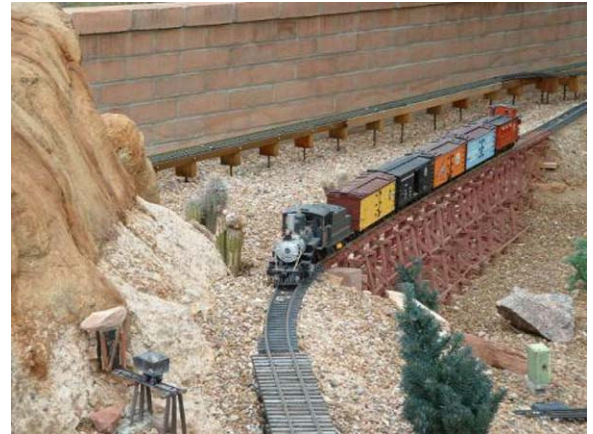
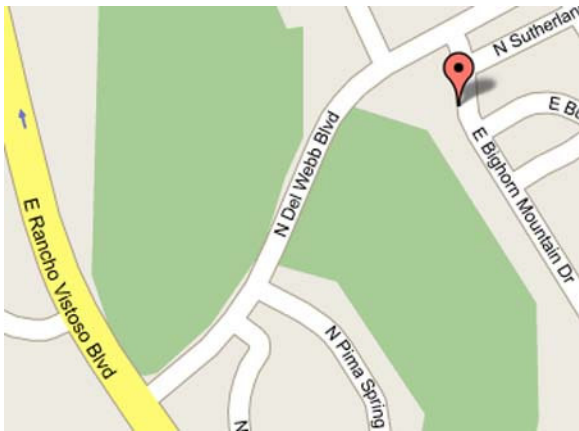
November, 2005

The November meeting is at Bob Hoffman's on November 19th at 10:00 am.

2044 E. Bighorn Mountain Dr.

Oro Valley, phone 825-6686

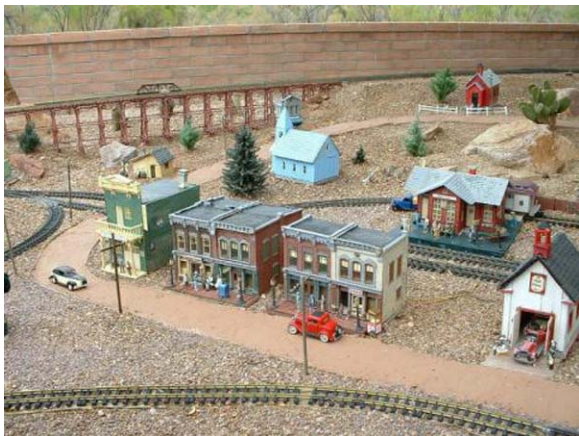
Going North on Oracle to Rancho Vistoso, turn left. Going South from Saddlebrook, turn right. Proceed to Del Webb where you turn right. Proceed to Bighorn Mtn. where you turn right. It is the 4th house on the right.



**Train coming off the trestle in front of the mountain**



**Train passing behind the stores and the mine**



**Downtown with trestle in background.**

### The Cactus Corners Railroad

The railroad at Cactus Corners is a small mining road. The town was once bustling with commerce, with a main street boasting several stores, a hotel, barber shop, and a gas station. At the peak of its prosperity a trolley line was put in to run workers from town to the mines and the

roundhouse. As the ore began to run out, the mines closed down until there was only one remaining in operation.

The railroad itself is an elongated figure eight with about 350 feet of track that starts at the foot of a four-foot mountain. As it winds around and down, it passes through the mountain by way of a tunnel that leads into Cactus Corners. If it happens to be the monthly diesel from the mail line, it stops briefly at the station to pick up passengers. Leaving town, it winds up and around and over a ten-foot trestle that brings it back to the upper level.

The buildings are a mixture of kits and scratch-built. There are three engines and numerous cars. The trains can be run directly into the house by way of a siding which leads into a patio room for storage.

There are approximately 350 feet of track, ten switches, and a yard with a turntable and engine house to house the trains.

The engines are battery powered. All the switches and turntable are manually operated. There is also a 30-foot electric trolley line which is operated by an LGB reversing shuttle unit....

### **We have a volunteer for secretary**

Ellen Stoesser graciously volunteered to take up the pen and paper as the TGRS secretary. Everyone should thank her for volunteering. She will be confirmed at the next Board meeting.

## **Adhesives and Solvents**

Part I of II

©(Wayne and Mary Cay Wesolowski 2005)

### **By Wayne Wesolowski**

Wayne is a retired Chemistry Professor from Benedictine University near Chicago and now teach undergrads chemistry at the UofA

### **ALWAYS PROTECT YOUR EYES AND USE GREAT VENTILATION!!!!!!!**

There are literally thousands of adhesives available today. How do you pick the right glue for your needs?

Many broad-range adhesives will bond almost anything to anything, but we might look at a few rules for good glued joints. This will lead us to

selecting adhesives.

Biologists have recently discovered that geckos –the little lizard-like creatures that race across garden walls or your ceiling don't have any sticky fluid or claws on their feet. Rather they can expose millions and millions of tiny hairs at will and the mere contact of such a huge surface area gives them traction. The super mops and "micro-surface" cleaning towels use the same principle. It's simple contact that makes a bond last.



### **Wayne giving a workshop on adhesives, Photo by Gina Blackwell**

My grandfather Tony who was a builder passed these rules down to my father Ed Wesolowski who shared them with me.

Rule 1 – make a joint as mechanically tight as possible. It's the large areas of contact that make a good joint.

Rule 2 – use as little adhesive as possible – gooped and oozing joints will not be stronger and may actually be weaker and fail.

Rule 3 – dry fit your joints first and apply the glue only where you make the most contact.

Rule 4 – clamp every joint until the adhesive has set...even super glues need a little time to reach maximum strength.

Most projects will use more than one type of adhesive although some modelers have a favorite that works for almost everything. Find something that works for you and stay with it where reasonable.

### **Wood and porous materials**

Porous materials need something that will penetrate pores and fibers and then through a chemical reaction bond one surface to another. Let the glue flow into the grain, get the wood

tightly held together and then the adhesive can do its work.

● **animal glues** – hot hide glues are extremely stable. Some 400 year old English ship models are still bonded with hide glue but they can be water sensitive and fail.

Water borne glues are tiny globs of different chemicals that are suspended in water. As the water evaporates the chemical globs are forced to break, mix and then react forming the bond. It's like the droplets of oil mixed in vinegar for salads. Take away the vinegar and the oil drops coalesce together. If you have two different chemicals in different drops they will not react until the drops are combined as the water evaporates. These carry a warning “do not allow to freeze” since that would break the droplets and the reaction would take place in the bottle not in the wood joint.

The water is meant to carry the glue into the wood fibers or porous openings. Arizona is so dry the glue may dry on the surface before it has a chance to flow in. I routinely wet the pieces of wood I'm bonding just before applying the glue. You will see how well it flows. Moisten the wood—but don't soak it.

● **aliphatic glues**—Elmer's white and carpenter's-- polyvinyl acetate, polyvinyl alcohol—water borne – freezing destroys them. White glues do not sand well, but kind of roll up and pull. The white glues have a definite life time. When we moved to Arizona three years ago my 30-year old wood models were carefully packed in bubble wrap. When I opened them here the trip converted them to piles of sticks -- they were kits. The joints had just fallen apart. Use diluted white glue (school glue) for indoor scenery

**Titebond II/III**, Carpenter's Glues– yellow glues are waterproof and sandable with quick tack (remember to clamp even if the glue is holding). Hopefully these will last longer, but I don't have any 30 year old models with these.

Double Gluing -- first coat to seal, second to bond.

When making a butt joint – end grain exposed. I lightly coat the end first, let it dry and then apply a second coat of glue to make the bond. Open grain will pull out all the water too quickly and not let the adhesive react in place.

● **Polyurethane** 100% solids glue -- Gorilla Glue/ ProBond -- great but oozes (foams) easily. These glues need moisture to begin

setting. With large surfaces ooze seemed inevitable. To stop it I put a ring of carpenter's glue just inside the edges to form a barrier around the polyurethane glue. Since water catalyzes the polyurethane it stops the foaming as it crawls to the edge. These are not very good for small things but great for panels and large surfaces. The foam version will bond rocks together even though the gap is large. Again it's so dry in Arizona that it helps to moisten the wood.

● **Flooring Glues** – more powerful white glues (a little Plexiglas type bonder added)

**Liquid Nails** -- from the tube it has some plastic adhesives, a lot of solvent, some clay and limestone. It's fine for wood panels, will craze styrene badly because of it's high solvent content.

**Ambroid Cement**-- Judges of smaller models do not like to see any glue ooze. A trick with Ambroid is to glue both surfaces and let them dry. Then dry fit the pieces together with clamps and reactivate the bond with acetone ( old style finger nail polish remover—if it smells like bananas it's ethylactate and won't work). The bond is perfect and absolutely ooze-less.

#### **Styrene Bonders:**

Bonding styrene is NOT gluing the pieces together, rather a solvent dissolves both surfaces. The molecules from each piece mingle together and the solvent completely evaporates leaving solid styrene behind. No “glue” at all remains.

Almost all commercial styrene cements are one of two chemicals. Both are clear, extremely flammable and flow like water. One evaporates slowly, the second almost instantly.

● **MEK** (methyleneethylketone) is dirt cheap in the local hardware store (Home Depot)—a quart lasts me years. It is not a carcinogen (MSDS and many studies) but as any solvent it can be toxic. Use PLENTY of ventilation. I glue large sheets together outside. Use as little solvent as possible or the pieces will pucker. It takes a little while to evaporate. MEK is the perfect solvent for styrene but will not bond (dissolve) the harder plastics like ABS.

To thicken MEK dissolve a few solid chips of polystyrene in the liquid. In a few days it will dissolve and the liquid will have a little more body.

● **Methylene chloride** (dichloromethane) is a

powerful solvent that evaporates very quickly—it requires a California warning label about cancer. It appears in several commercial plastics cements, but I would again use plenty of ventilation.

It can bond ABS and the new “super styrene” sold by Midwest Products as well as styrene. If the joint is not very tight it will evaporate before dissolving the plastic.

Be very careful not to use too much solvent. I find brushes, syringes and similar applicators apply too much liquid. Here’s my solution.

-- I use a fine glass tube applicator called a Pasteur or transfer pipette. Any very fine tube will work. Without a bulb dip the tube into the solvent. By capillary action the liquid is drawn up the tube. With the two pieces of plastic held tightly together just touch the tip to the joint. The solvent flows again by capillary action directly into the joint and stops when it’s full. (I located a store locally that sells these small transfer pipettes for about a buck each, ADC Products, 3220 South Dodge (just North of Ajo), call first for hours 790-9499. They also have Methylene Chloride. Editor)

## Weathering A Mill Gon

By Dick Izen

Inspired by Gary Martin’s clinic on weathering without an airbrush, at the October TGRS meeting, I decided to give his techniques a try with a steel mill gondola. In fact, I think Gary got me to purchase this car when he was helping some people get rid of their collection. Gary said that car was too modern for his narrow gauge railroad so I would ‘have to’ buy it since I run a modern (more or less) mainline railroad. Since my railroad is more mainline I wanted just a light weathering job. The car should look like it has some service but still meets all of the interchange rules.

What, you ask, is a mill gon? It is a steel gondola car built with thicker and stronger than normal sides which are attached more firmly to the car’s frame so that the ends can be lowered without affecting the car’s stability and rigidity. These cars often have “fishbelly” sides (as does mine) that dip lower between the trucks to add structural support like a bridge.

In addition the brake wheels are side mounted so that they will be out of the way when the ends

are dropped. Often these cars were in semi-captive service from a particular steel mill or group of mills. My car was lettered for the Pennsylvania Railroad and had lettering that said “RETURN TO BETHLEHEM, PA. WHEN EMPTY”, (the small letters to the left of the car number).



## Mill Gon as delivered

These cars were designed to carry finished products such as steel coils, pipe and beams from steel mills to customers. The drop ends facilitated carrying steel items longer than the car itself. Securely blocked, or braced to the floor, the beams (or pipes) could extend past the ends of the car and ‘float’ over an empty or ‘idler’ flatcar at either end. If the beams were much longer than the car they had to be centered in the gon to minimize overhang as the train swept around curves.



## Ends dropped to allow loading of long loads

Despite being relatively modern steel cars, mill gons had wooden floors to facilitate nailing the wood blocking or bracing used to keep the load in position on the car. The model car came with



### Factory red 'wood' floor

the wood molded into the floor but it was colored in the same bright red as the sides of the car. In service however the paint would be worn off the wood and the floor would be dirty and stained almost black from exposure and rust and oils from the loads. The first job then was to color the wood floor brown and to overspray that with flat black and brown primer. My first result was actually too dark with not enough 'wood' color showing through but that is one of the advantages of spraying light coats of color from a distance. What lands up on the car is such a thin coat that it can be oversprayed without loss of the molded in details. I resprayed with the brown wood color and got an acceptable result. Note the irregular look of the floor with only some wood tones showing through.



### Painted 'wood' floor

The next job was to lightly spray the entire car from a good distance (Gary said 12 inches but it may have been even further) with red primer. This forms an almost invisible coat that allows the white lettering and logo's to be seen but dulls them and blends them into the car's colors, reflecting the car's usage. Next I used a brown flat paint to spray the trucks, wheels and lower

ends of the car to look like mud and dirt that had been splashed up as the car rolled along in service. In some places I let the 'splash' drift higher on the sides.



### Weathered car ready for service

Following Gary's rule of "stop before you do too much" that was it. As you can see from the pictures, the car won't win any beauty contests but it does look like it has rolled some miles delivering steel to customers. I have followed the same process with a couple of box cars and am pretty happy with the results.

### TGRS Layout Planning Grid

| Event             | Date       | Type  | PIC        | status |
|-------------------|------------|-------|------------|--------|
| Casa de los Ninos | 11/28-30   | kids  | J. Tulino  | def.   |
| St Marks          | 12/10-13   | kids  | B. Dirksen | Prob.  |
| VA Hosp           | 12/26-30   | full  | L. Sleeper | def.   |
| Winterhaven       | unk.       | unk.  | B. Dirksen | unk.   |
| GATS              | 1/28-29/06 | full? | -----      | prob   |
| Am. Home Sho      | 1/6-8/06   | full? | -----      | unk.   |
| TTOS              | 1/21/06    | kids  | -----      | Prob.  |

### TGRS Shirts and Caps for Sale

Joe Stoesser has shirts and caps for sale, so that he can get a new order for the events coming up(?) He has 6 caps---3 large & 2 xlarge brown ones ----3 blue short sleeve--2 small & 1 medium--2 long sleeve x-large.

### MARTIN'S HOLIDAY OPEN HOUSE OF THE

### EAGLE MOUNTAIN RAILROAD

4625 E. CERRO DE AGUILA, SUNDAY, DECEMBER 4th, 12:00PM - 4:00PM. FAMILY AND FRIENDS ARE WELCOME, ANY QUESTIONS CALL 299-7428

## New Members

The TGRS has not had any new members join our organization in the past month.

## Electronic News Letter

With so many new members, I want to remind you that you can have the news letter delivered by e-mail. The club saves printing and postage costs but more importantly you get the news letter faster and can view the photos in color.

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 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 30<sup>th</sup> of each year. For new members dues are pro-rated at \$2.50 per month remaining in the year until June 30<sup>th</sup> 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 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

**Nov 19 Meeting at Bob Hoffman's**  
**Dec 10 Meeting and Holiday Party at Mike and Jane Dorgan's**  
**Jan No meeting scheduled due to multiple displays**  
**Feb 18 Rincon RV Park**  
**Mar Meeting at Jim and Madelyn Cook's**

### TGRS Officers and Board of Directors

**President:**.....Nick Buchholz.... 520-744-4932  
**V-President:**.....Chuck Cook.....520-797-1066  
**Secretary:**.....Ellen Stoesser....520-577-1210  
**Treasurer:**.....Willis Fagg.....520-760-0147  
**Editor:**.....Jim Miller.....520-886-7611

**At Large Board Members**  
Jim Cook.....520-760-2325  
Rick Gast.....520-721-8305  
Lew Sleeper.....520-751-9628  
Joe Stoesser.....520-577-1210

**Tucson Garden Railway Society**  
**8132 E. Baker Dr.**  
**Tucson, AZ 85710**