

## **NMRA Midwest WISE Division: “Thomasville Region of the C&NW”**

This mythical railroad services the mountainous Thomasville region of the C&NW. It begins in Jamestown, a grotto area located in the valley south of Mount Anna. From there it runs via Lee’s Lament, the limestone chasm at the base of Mount Anna to Danville a LCL freight operation and often busy passenger station. Then, under picturesque Mount Marge we travel around Slavko’s Slough finally connecting with Sam’s Subway the below ground entry to Mt Laura. There, we travel through Sam’s tunnel to the main station at Thomasville. Thomasville, founded by Thomas, better known as TJ is a thriving industrial city framed by Mt Laura on one side and Darla’s Downfall on the other. The Thomasville Division runs the valley traffic in a mountainous division.

Trains en-route to the logging and mines must continue onto the Outasite Mountain Division. There, perhaps pausing at Rogersville wends its way thru the mountains and proceeding thru to the Mt Laura Division, Norwood Park and finally to the Mt Anna Division, where the Willard’s Woods and Halie’s Bark and Lumber manufacture valued rail commerce. We cannot discount the valued raw materials from Hersor Mine or local coal mines.

Trips up to the very top of the layout can take as little as 12 minutes and as long as a half hour depending on traffic. Full round trips can take as little as 30 minutes and as long as an hour. Figure about 45 minutes for a round trip with normal traffic.

This is a layout with few parallels. We planned to have it functional on all levels by the end of four years. It will be there or very close by mid 2008. It is a hobby so goals change. Don’t they?

### **Kids Learn Elements of Construction (examples performed to date \*):**

1. Butt splice \*
2. Wire tie \*
3. Run wire \*
4. Mark wire \*
5. Strip wire \*
7. Terminate wire \*
8. Install jumper \*
9. Explain circular flow \*
10. E = IR theory
11. Make plaster \*
12. Color plaster \*
13. Make Earthform \*
14. Plant Trees
15. Find Lichen \*
16. Clean Lichen \*
17. Color Lichen \*
18. Sieve Materials \*
19. Decorate
20. How to saw wood & other materials using a cross cut or rip saw \*
21. Use of screwdriver & screws of various sizes \*
22. Use of hammer and nails (which they all like best) \*
23. Joining materials with nails, screws, glue \*
24. Using glue for a variety of unexpected uses \*
25. Use a vise and various clamps\*
26. Wire tinning & soldering irons \*
27. Multimeter use: volts, resistance, clamp on amp meters.
28. Safe Shop Operations with safety eye glasses \*
29. Use of drills, drill bits, circular drills \*
30. Leveling things with bubble levels \*

### **Framework:**

1. Pine 1 x 4 and 1 x 6 semi clear (handpicked) lumber from store for the basic open frame construction.
2. All other lumber (perhaps 90% or more) came from burn pits at new or remodeled homes after speaking with carpenters and various contractors. This layout is very much a dumpster diver's paradise.
3. Table legs 2 x 4 from dumpsters with 5/8-inch lag bolts on the floor end for leveling.
4. Table is affixed to walls and support posts as well as having legs.
5. All joints are made with screw nails (preferably #2 square drive) or hex drive as a substitute. Nails are generally avoided. Exceptions include wire staples.
6. This is a space frame, akin to a modern auto; the horizontal and vertical members are integrated with the sub roadbed of wood for track support and form an extremely strong labyrinth.
7. All wooden members are filed and or sanded to prevent splinters and once installed and free of protruding screws are painted grey.
8. It's not all grey, nor perfect; but, so far the kids have avoided any hazards.

### **Backdrop:**

1. The Sky will be a nondescript overcast sky not angry or happy but one to cause eye avoidance. It'll be detailed with foreground hills and trees at some point.
2. Sky construction shall be of melamine glued to 1 x 2 s and supported by the table with a gap between sky and scenery of 1 – 2 inches (or thereabouts).

### **Lighting:**

1. Room ceiling lighting is divided into two ceiling circuits: one is partially turning green incandescent and the other circuit neon lights.
2. Under-table operational lighting is provided with green rope lights. Thus, the kids can go under the table and readily see where they are going.
3. Under-table neon lighting is also installed for daylight operations and servicing or maintenance.

### **Track:**

1. Had sufficient Lionel O gauge track and turnouts for layer 0.
2. Used GarGraves Phantom 3<sup>rd</sup> rail for balance of O gauge layout.
3. All flex curves have a modest lead-in to working radius.
4. Radius used varies. Sharpest is Lionel 031 on layer 0.
5. Slight banking of turns under flex track exist in some locations.

### **Track Electrical Connections:**

1. Drill a 1/16 dia hole in the rail (below mid height) and insert a 1/16<sup>th</sup> inch cotter pin clipped to be about a half inch long to which a 6 to 8 inch lead wire of 16 to 18 gauge insulated wire has been soldered.
2. Trim the cotter pin to avoid striking a wheel flange and solder the combination first to itself then to the rail.

### **Grades:**

1. Four subdivisions (rail districts) for youthful operator's operations are generally flat. Each operator (ages 6 up) runs one train per district with supervision.
2. Mainline has a 1.5 % grade maximum. Current dispatch rules say that it takes an adult to run from district to district (on the mainline).
3. No grade, including at mines or businesses are more than 2%.

### **Roadbed:**

1. Wooden vertical and sub-roadbed and scenery supports are 1/2 to 3/4 inch thick pine, plywood or chipboard. All are screwed to the open framework and sub-roadbed.
2. Under track is 1/2 to 3/4 inch pink foam glued to wooden horizontal members. Some of this pink foam was actually purchased !
4. Oil dry is planned to be used for ballast. It is very inexpensive and in prior layouts worked as well as sifted real stone without the work or cost.

### **Power:**

1. Three household circuits are available with a total of 45 AC Amps.
2. Wall outlets are effectively extended to additional outlets mounted on the table legs to distribute power to under table lighting, power strips and transformers.
3. In truth I have not as yet figured the total electrical load. Call it an oversight. There are a few.

### **Power Packs:**

1. Layer 0 has a Lionel ZW transformer with 275-Watts output.
2. Layer 1 has a Lionel single engine transformer (upgrade later)
3. Layer 2 has a small Marx transformer (upgrade later)
4. Layer 3 has a small Marx transformer (upgrade later)
5. A 14-volt special duty transformer is used for rotary bridge, water tower and coal loading accessories.
6. A 12-volt transformer is available for turnouts.
7. A 5-volt transformer is available for lighting.
8. Estimate 5-8 years before sufficient power packs exist. We are in year three at this writing.

### **Controls:**

1. Each division or layer 0-3 shall have its own control panel such that one child may operate his or her trains on that layer. One is complete and another is partial.
2. Each division or layer 0-3 shall have the capability of running two trains, start-stop using manual block control and turnout control.
3. Each layer 0-3 shall have the ability to run two trains semi-automatically either simultaneously or start stop or both, depending on the layer.
4. Trains shall be capable of running from one division or layer to the next division or layer with supervision of a *Dispatcher* who at this point is yours' truly.
5. All blocks will be capable of switching between manual control and DDC on any layer.

6. DDC will be used on one layer initially and use expanded based upon power supply improvements.

### **Track Cleaning:**

1. The layout is built in the basement of a building on top of a hill. The area is mostly sand with some gravel and glacial rocks. The area drains well and the basement is generally quite dry.
2. A dehumidifier is used to maintain humidity in the neighborhood of 45 percent with a room temperature of nominally 68 degrees F.
3. Soft *Scotchbrite* impregnated with *WD-40* has been used occasionally to dress the tracks for electrical contact reasons.
4. We've been running trains for two (2) of the three (3) years construction.

### **Scenery:**

1. Children must be able to stand within the mountains, see the trains inside the mountains, access the stations, and play there without fear of getting hurt.
2. Scenery shape and form is supported by chicken wire (again from past year's neighborhood gardens and thus escaping the trash pile).
3. Rags soaked in inexpensive plaster of paris laid upon the chicken wire make a very inexpensive and extremely childproof surface that will not break under the forces of play. Nor will they crack under abusive use.
4. Detailed surfaces are mixed with varying ratios of sand, gravel, and joint compound suitably colored with bulk colorant (available for latex paint).
6. A variety of ground covers will be used for industrial and woods areas.

### **Scrubs and Trees:**

1. Lichen abounds. It is picked just before the first snow on a rainy day. Cold is good; bugs are elsewhere.
2. Wash the material in clear water. Skim off the bugs, pine needles, etc.
3. Boil some *Rit* clothing dye in a four-quart pan. Add a pint of *glycerin* to the solution. Use heavy rubber gloves and start dunking and squeezing your lichen and set the warm stained product in a plastic laundry basket. The various pieces can have a multitude of colors and shades. We used dark green, yellow, and orange coloring. Natural Norwegian lichen is light green. Reheating the dye is nice; but it seems to work nearly as well in a cool solution.
4. Bag your product after air drying for 24 hours or more hours and shooting it with a few squirts of *Raid* to keep the bug population from finding a new home.

### **Woods Ground Cover:**

1. Pine needles are wonderful and inexpensive. Simply pick them up. Dry them out. Spray with *Raid*.
2. Buy a Warring or Oster Blender at the resale shop for a couple of bucks and cut the pine needles into fine pieces. Toss them on the ground for cover.

### **Wooden Retaining Walls, Snow Shed, and Trestle Pilings:**

1. You can buy round straight wood at any hobby or hardware; however, the dreaded buckthorn has very straight members, looks realistic, and saves money.

2. Milk weeds in the Racine area have very straight stems and make nice strong trestle rounds.

### **Bridges:**

1. The longest straight bridge on the layout was kit-bashed from four *Plasticville* kits. It is a through truss steel bridge and is 144 feet long. It is actually self-supporting without an intermediate pier (I inserted steel stringers); however, for realism piers will be installed.

2. A shorter twin track parallel version will be soon built to span a nominal 96-foot span.

3. Three very short single steel truss bridges were kit-bashed. Several steel through girder with concrete pan will be scratch built for nominal 75-foot spans.

4. A rotary bridge is installed at the only navigable waterway adjacent to Slavko's Slough.

5. A stone arch bridge, almost 192 feet long will be constructed above the Jamestown grotto valley area.

6. Our only wooden bridge structures are on the upper reaches in the mining district. One is a curved trestle.

### **Tunnels and Snowsheds:**

1. There are about 17 tunnels on the layout. Some have natural rock entry but most were cut from 2-inch stair tread and engraved with a high-speed cutting tool.

2. Tunnel interiors are made with roofing materials bent to shape or simply more plaster soaked rags on chicken wire.

3. Snow-sheds are made of that dreaded buckthorn material.

### **Automated items and structures: (none yet operational)**

1. *Lionel* water tank for steam locomotives.

2. *Plastic Ville* water tank with manual operation.

3. *Lionel* Coaling Tower (1945 #97) with custom loading chutes.

4. *Lionel* belt Coaling Loader ( #397)

5. *Lionel* Log Loader

6. *Lionel* Milk car unloading.

7. *Lionel* Crossing Gate.

8. *Lionel* Street Lights.

9. *Lionel* lighted Spur bumper.

10. *Lionel* Block Signal Lights ... etc.

### **Other Structures:**

1. Custom Thomasville Station (240 feet long with loading docks and rooms)

2. Custom Train shed at Rogersville

3. Custom Interlocking Tower

4. Custom Barb's Blasting custom dynamite repository (blows up)

5. Custom Jamestown Station

6. Custom Willard's woods log operations

7. Kit bashed Slavko's Slough old folks home

8. Custom Roger's Reward mine and Hers or Mine, Inc. facilities.

9. Custom Coal mine. ... etc.

### **Control Panels for Manual Control:**

1. There are four panels. One panel for each division or layer and interconnecting mainline. Each panel is constructed using a 3/4-inch wood frame with a white 1/8-inch melamine surface. The latter was purchased inexpensively.
2. Turnout directions for all the Lionel switches are simple nuts and bolts. These are #10 round head of 1/2 or 3/4 inch in length. Wire from the Lionel turnouts goes first to terminal blocks. The terminal blocks are then jumped to the selector bolts that are sighted on the track of choice. We switch the hot lead with one hot connection lead simply by touching the desired direction. Thus, we have manual control.
3. All turnouts are wired to automatically initiate frog movement when necessary to prevent derailment.
4. DPDT toggle switches are used to select one of two power sources for a particular block of track. Most DPDT switches have a center off position to instantly drop power to a block. Some DPDT switches have a simple left or right position where shutoff is not an important consideration (we don't want the kids to block the main line).
4. Graphics are simple drawings made on an Apple computer using the drawing software that comes with each unit.
5. A clear plastic cover is made using standard opaque projector sheets.

### **Route Control:**

1. Four sub-panels are used to select semi automatic routing. One panel for each layer allows manual control from one or more transformers, manual or DDC, or autoroute control.
2. Each panel has one or more automated routes and provides hands off control of two train operation on a particular division or layer. No two divisions or layers is identical and thus do not operate the same.

### **Uncoupling features:**

1. Standard magnetic uncouple tracks are (and will be) scattered about the layout as needed. These operate via pushbutton at the four control panels.
2. Manual, remote uncouple magnets are provided at a few locations simply as an experiment.
3. Newer engines have DDC uncoupling features.

### **Sound:**

1. There is a CD player with speakers mounted in the mountains. This allows routine railroad sounds to be produced as background noise.
2. Newer engines have sounds appropriate for their particular type.

### **Video:**

1. Four cameras will provide a limited view of the system and will be augmented, as resources exist. Panel placement generally takes care of most needs.
2. Camera 1 : a view of Thomasville Station and the mountain above.  
Camera 2 : a view of Slavko's Slough and the Mount Marge Area.  
Camera 3 : a view of Mt Anna traffic.

Camera 4 : a view of Roger's Reward yards and sidings on Outasite Mountain.

**Sensors:**

1. Track in use sensing is available on layers 1, 2 and 3 but not layer 0.
2. Block signals will be installed in future years.

**Costs:**

1. Nearly 650 feet of track and about 40 turnouts represent an investment.
2. Motive stock representative of 1930 through 1975 is the 40 - 50 foot Freight car and 64 – 72 foot passenger car era. The layout will handle 80-foot cars and modern engines. Our motive stock has 0-6-0 Switcher, 4-6-2 Pacific, 2-8-4 Berkshire on the steam side and twin E-3 A units, and a variety of diesel switch engines. C&NW colors and logos are predominant; although the railroad leases from others. There are thirty freight cars and eight passenger cars. Nothing is rare: all are used and serviceable.
3. The woodwork represents a \$400 investment. Trash dumpster diving paid dividends. Free lumber, screen wire, rags (begged from neighbors), and weeds.
4. Wiring was mostly left over short reels from jobs in the control business.
5. My wife has been told that \$400 was spent (she hasn't asked thereafter).
6. Cost? Not much per year when you're my age and began at age five.

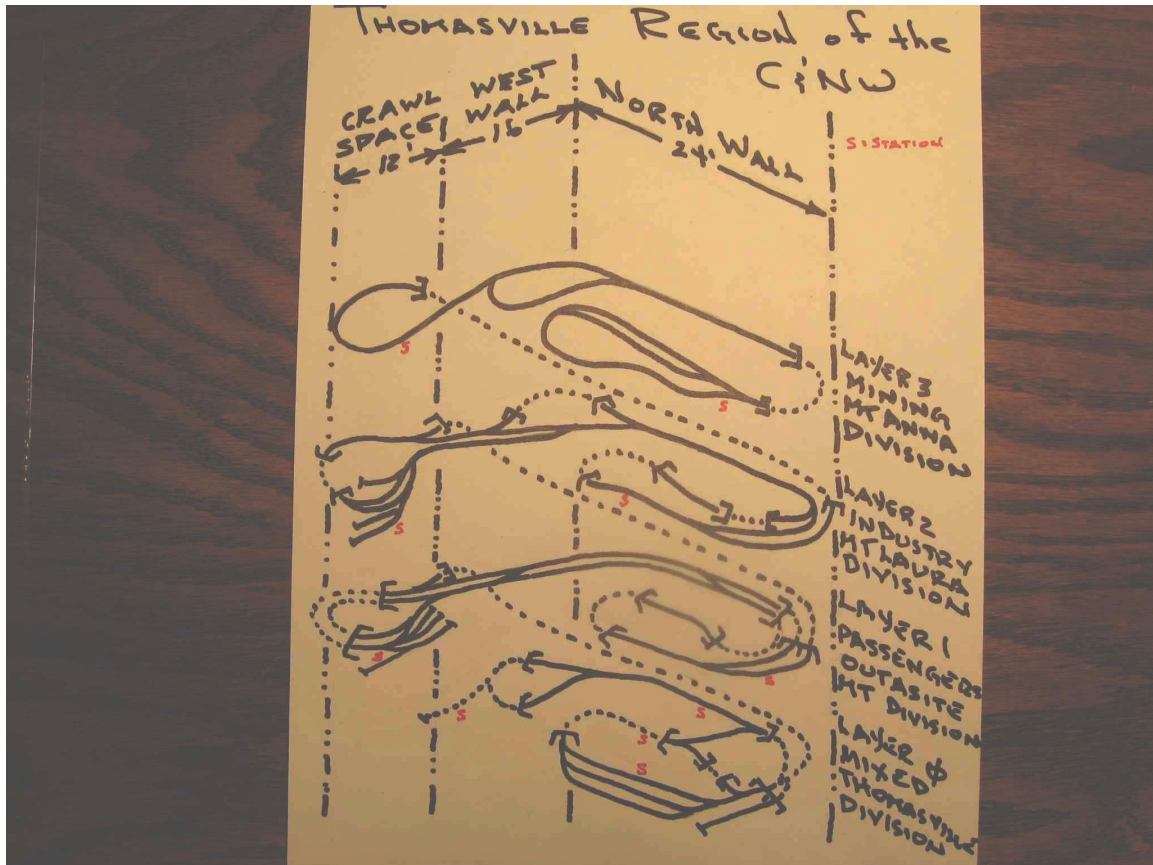
**Maintenance:**

1. All turnouts are easily reached for lubrication and repair.
2. Rail joints are provided with about 1/16 inch freeboard (0.0625 inches) on straight runs to allow for the expansion and contraction possible (of roughly 0.02 – 0.08 inches). No obvious bending or buckling of track has been obvious although the mean temperature has varied between 40 and 90 F to date.
3. All tracks are easily reached for re-railing (some from within the layout).
4. Block control allows for rapid isolation of derailed equipment without disrupting other operations.

**Construction Schedule:**

1. This project was begun during the summer of 2004. Employment limited the effort to a week's work that summer. In the fall we had a long weekend to devote. Our grandchildren were ages 9, 6, and 2 at the time. This was a big adventure. We had one train run at the end of one year's effort. We were on schedule.
2. In 2005 my wife and I went to Russia and later to Germany in two trips. Our schedule on the layout was disrupted. The kids helped again as did our son in laws. They enjoyed seeing trains run, helped with wiring, and we fell behind a bit.
3. In 2006 we made considerable progress on Labor Day weekend but were gone quite a bit as I began to experiment with retirement. Thirty percent track done.
4. This past year, 2007 we spent a month peddling across the low-countries in Europe. Again, Labor Day weekend was very productive. Now, more than 90% of the track is down. Only perhaps 25% of the wiring is done.
5. We again worked on the layout during the Christmas Vacation 2007-08. Grandchildren, Laura 12, James 9, Anna 5 came up from Indiana for nearly a week. Other grandchildren, Dan 9, Thomas and Sam 5 came over from Eau Claire. We had fun and moved

our project along. By summer we will be at the end of year four of a four-year schedule to get all levels running. They will be. But, scenery will be a bit behind schedule.



**Summary:**

This project will take a lifetime. There is no question regarding whose lifetime. We are taking about their lifetimes. Ours task is that of teacher, fundraiser, and protector.

Written by Roger G Blocks, P.E. for the NMRA Midwest WISE Meeting at Midway Motor Lounge, Milwaukee, Wisconsin, January 20, 2007.