Modelling the Prototype

Layout Concepts and Construction

Introduction

The hobby of model railroading has come a long way in recent years. In the 1950's the average home pike usually consisted of the sheet of plywood, with an oval, and perhaps a few turnouts, allowing for a bit of variety in switching moves, or whatever. Most of the scenery was quite simple, usually rising above track level only.

Modeling techniques have come a long way since then, with the introduction of open grid bench work and "L" girder construction, hard shell scenery, finer detail in the equipment, structures, and scenes, and much more overall realism in all aspects, including electrical control.

In all of this, most modelers freelanced their layouts, perhaps adding features or flavour of a particular prototype, but generally doing what they want, where they want.

In recent years, there has been somewhat of a movement into being more specific, not only in equipment, but also in scenes, and themes of a specific area. This has led to quite a significant movement within the hobby, to what has been termed "prototype modeling". All sorts of SIGs (Special Interest Groups) have been formed to support and feed the information needed to allow folks to carry out their prototype practices in an accurate manner.

Issues to Consider

In prototype modeling of an entire layout there are certain issues and concepts to be considered. Some of these are:

1. What railway line, or location should be chosen to model
2. What era or time period do we want to represent
3. How will we obtain the information about the railway line we want to model
4. How will we fit the scenes into our available space
5. Will we model only one, or a few scenes
6. How will we tie these scenes together into an operable layout
7. Depending on the expanse this layout will cover, what type of control will we use to operate the trains

There are bound to be many more issues that will come to mind, but I will attempt to give you an example of some of the solutions I have found.

An Example of Prototype Modeling

After years of careful consideration, for many reasons, including personal favorite locomotives, structures and locations, I chose the Hagersville Sub of the Canadian National Railways, as it was in June of

1950. This sub ran from its junction with the Grimsby Sub in Hamilton, all the way to its southern most points, being Port Rowan, and Port Dover.

Factors in My Choice

This railway line offered a major locomotive facility, a large city passenger and express station, and extensive freight sheds at Hamilton, main line trackage in the streets, and a locomotive pilot (helper) district. In addition interchange took place with other railway lines at four places. There were many opportunities for lifts and setouts along the route, there were turn around facilities at the ends of the line, and lots of rural way freight and mixed train traffic to deal with along the way. All this was to represent about a 65 mile trip from one end to the other.

1950 was chosen because it was probably the busiest time this sub would ever see. The physical plant was in the best condition, and the economy was optimistic and positive. June would give me the lush full vegetation in the scenery to provide the necessary view blocks and scene coverage. In addition, there was a major strike on the railways in late summer of 1950, so that wouldn't do…we wanted to run trains!

Researching and Exploring Sources

The prototype for my railway line was quite local. Most of the trackage is now gone, but walking trails form a good part of the old right of way, and there are still a few miles of intact, active track from Caledonia, south through Hagersville to approximately Garnet, being operated today by Railink, more recently RailAmerica.

Walking the rail trail areas, with camera in hand, reaps rewards such as interesting bridges over streams and farmers access lanes, far from any public road. Passing sidings and spurs into long forgotten industries, such as the gravel quarries at Hagersville can be discovered.

Old railway timetables will reveal station stops and connections of the period. An employees timetable will give tremendous detail about the line, such as speed and locomotive restrictions on the Grand River bridge at Caledonia, which can directly effect both the locomotive roster and the operations.

Photographs of the period are perhaps the most valuable resource. I have been able to collect enough photos to cover almost every aspect of my line. Locomotives, rolling stock, structures, right of way details, and track arrangements can all be studied, and duplicated with the use of good pictures.

Topographical maps, railway subdivision schematics, and talking with local citizens can greatly help to paint a clear picture of the railway as it was.

Probably one of the best sources of information is if you can locate and talk to a retired railway employee who worked the line in the

appropriate timeframe. This can give a lot of insight into operations and practices employed on the line that can not be found in any timetable. Only scheduled trains, such as passenger and mixed trains are found on timetables. Most other traffic such as way freights were not on schedules, but proceeded as required, staying in the clear for the scheduled traffic to pass by if need be. Many other details can be discovered from employees.

For example, a retired employee told me that much of the switching of cars into and out of the Ferguson Avenue freight sheds was conducted at night. The tracks there were spaced especially close to each other, and the cars were spotted with the doors in alignment to allow planking to be placed from car to car. This allowed the handlers on day shift to pass with their carts, from one row of cars to another. It would have been disastrous to have a car moved during this work.

Fitting the Scenes into a Layout

The biggest problem I found in planning my layout was how to fit the scenes I wanted into a home sized layout. How was I going to realistically fit or blend one scene into the next, when there were perhaps miles involved between these scenes?

I decided not to blend the scenes at all, but to frame out and build a series of windows, or vignettes, sort of like big shadow boxes. The railway would enter the scene from behind carefully positioned buildings, trees, or from under a bridge. No- I couldn't cheat as in freelance layout design, and introduce a handy tunnel. There were no tunnels on this line.

I was determined that in designing the scenes, they must be placed correctly in sequence, and though selective compression was certainly a must; the scenes would be very recognizable.

Miles of right of way, or locations that just couldn't be fitted, could be dropped from the design, while maintaining the important, and the interesting ones.

After struggling with the planning and blending of the scenes I wanted to include, it soon became apparent that to fit this all into my available space, the layout would have to be built on two levels. A hidden helix would carry trains from the lower to the upper levels, and back down again.

This helix has been positioned so that it is situated in the hidden trackage, which is climbing the escarpment. This was a helper district, with assistance from additional locomotives as required to get the tonnage up the grade. This was a natural place to utilize this feature, and add interest to operations. Trains also use this helix down bound to other areas of the layout by placing tangential turnouts as required in the design. This also adds interest to the dispatcher in keeping traffic flowing smoothly.

There was another concern about the layout design. An operator or viewer has to get to the inside area of the layout soon after entering the room. I wanted to avoid employing a duck under if at all possible. This has

been largely overcome by constructing a swing gate at a location on the lower level trackage where there is a single track, and plenty of trees and vegetation to help hide the seams. This gate swings out, complete with its scenery and backdrop. Only the lower level portion is involved, which leaves a slight duck under the upper level at this point. The upper level was not included in this gate design, because there is a complex track arrangement in this area.

Design and Construction Techniques

1. L Girder Construction

In 1965, the late Linn Wescott, editor of Model Railroader magazine at the time, came up with an innovative design for layout framing and construction called "L Girder". This design made efficient use of select pine, featuring a backbone of 1"x2", and 1"x4", forming an "L" shape. Legs and bracing, and a series of joists fitted every so far to bridge across the girders, made up the basic framing. From there, simple risers support the track roadbed as required.

I chose this method for the layout, as it goes up quickly, is very strong, and allows total freedom to run both roadbed and scenery anywhere it's needed.

2. Spline Roadbed

An economical, and quick way of supporting track work in open areas is by using a simple spline roadbed support.

1" dressed select white pine is cut into strips 3/16" thick on a table saw. I usually use a 1"x3" piece, 8ft long. This will cut into quite a few splines, depending on the saw blade used.

When laying out the location of the roadbed, the centre spline is positioned first. You will find that the very nature of the strip will form itself into natural sweeping easements and curves. This centre strip is predrilled to prevent splitting, and tacked into position using a finishing nail and bonded into place with yellow carpenter's glue. When this is thoroughly dry, 1" spacer blocks are spaced and glued about every 12" or so on either side of the centre strip, and the outer left and right spline strips are glued and clamped to these. It is very important to maintain the three splines at the same level, though super elevation can be accomplished by simply allowing the splines to tilt to the inside of a curve.

In the case of positioning a turnout or siding, simply add more spacer blocks, and splines in the same manner as above.

In all the above construction, it is recommended that support joists be placed no further apart than about every 16" to allow for adequate support. When all this is glued and clamped together, the resulting construction is very strong, while being light in weight, and relatively economical.

3. Roadbed Construction

I choose to hand lay all of my track except that which is totally hidden from view. Therefore it is very desirable to have a roadbed which is both firm enough to hold spikes securely, and soft enough to be able to push the spikes into.

Homasote is an ideal material in my point of view. It comes in 4'x8' sheets, about ½" thick. Turkstra lumber stores usually carry it, and call it "train board". There are three disadvantages about homasote. One is it is rather expensive. Two, when cut with a saw, it is quite dusty. Three, if it gets wet at an edge, it will swell.

I make it a practice to cut my homasote into 2 ¼" wide straight strips on a table saw. Then these strips are set on edge, and cuts are made about every 2 ½" to a depth of 1½". This allows the material to be gently bent into curves, keeping the cuts to the inside of the curve. Lastly, the saw is set to cut a flat shoulder to a depth of about 3/16" about ½" in from each edge.

The homasote strips can be bent into a fairly tight radius. I have a 28" minimum radius on the layout, and this method of cutting the roadbed strips has allowed this. If a tighter radius is needed, simply make more frequent cuts.

These roadbed strips are glued and clamped straight onto the top of the splined roadbed using yellow carpenter's glue. When the glue is set, the saw cuts are filled with premixed drywall plaster. The plaster also is used to chamfer the side cuts into a nicely contoured shoulder for ballasting. When completely dry, (over night) the plaster is lightly sanded smooth, and shaped as required. The roadbed is now ready for laying ties and ballast. When laying the ties, I make sure not to lay a tie on a plaster filled saw cut. The ties are carefully positioned either side of any filled cuts so later, when spiking the rail, I don't push a spike through a tie and into only filler.

This method of cutting a sheet of homasote into strips makes the material much more economical, as the only waste is the sawdust.

The only place where a large expanse of homasote is used is in a yard or terminal area, where many tracks and turnouts will be located.

4. Lighting, Fascia, and Valances

Lighting is an important aspect in layout design. No matter how well an item is modeled, if it can't be seen, or if the colours appear off, the illusion of reality is lost.

I am using single tube fluorescent lamp fixtures fitted with 34 watt "Coolwhite" tubes. The light tends to bounce back to the very light pale blue backdrop surfaces resulting in a pleasing sunshine effect. Fluorescent lighting is even, gives off relatively little heat, and draws little power, compared to incandescent bulbs.

The lower level lighting is tucked behind the fascia of the upper level, which is forming the valance of the lower level. Upper level lighting has its own valance. In this way, there is no direct light shining at the viewer, and the model scene is the only area the eye is drawn to. Even the valance and fascia surfaces have no light directed at them, and so the eye is not drawn to them.

All fascia and valance surfaces are painted a pleasant olive green, which blends well with the overall scenery colours. The track diagram is laid out with white pinstriping tape on the fascia surface adjacent to track where there are turnout controls situated. DCC throttle plugs, each with two jacks, are conveniently located on the valance where required.

Dark green curtains hemmed and seamed into 6ft. lengths, are hung along the inside lower edges of the lower valance with velcro, and extend to the floor. Book shelves and general storage is located under the layout, all hidden from view.

5. Method of Control

The design of the layout dictates some sort of walk around control feature, so that the operator can stay with the train. A number of operators would be needed to run the layout, so multiple throttles would be required. In addition, I do not enjoy electricals, or electronics, and want to strive for a minimum of wiring, switches, and so on. The final factor was that I do not have a large roster of locomotives, and less than a dozen would likely be in my future.

It soon became apparent that Command Control would be the logical choice. I have installed a Digitrax system on this layout, and am very pleased with the results. The locomotive or loco and pilot engine is addressed, the consist and a throttle is dispatched to an operator, and the train is on its way.

Of course, what is really fun is having the two locomotives controlled by two individual operators, balancing and coordinating their efforts to have the engines work together, just as in steam days.

There are no block switches to contend with, and the operator can walk along with the train, concerning himself only with the track turnouts, and his train. The tethered throttles employ memory, so the operator can unplug the throttle, and stroll to another area, reinstall the plug, and carry on. Meanwhile the train has continued its running undisturbed. More recently we have fitted the layout with Digitrax radio throttles, allowing even more freedom for the operators.

6.Helix Construction

My helix has been constructed after a lot of reading, investigation, doodling on paper, and discussion with others. It is a total of 3 ¼ revolutions, at 30" radius, with 4" of elevation per revolution. Most is

hidden from view, but with full, easy access inside the middle. It is constructed of ½" plywood, cut 4" wide, supported by lengths of 1"x2" pine, with precise ½" slots spaced every 4" cut into their sides. These cuts are angled to approximately 2% to suit the grade, and are spaced, and glued about every 16" around the helix, alternating every other one on the inside, or outside of the plywood. The lowest revolution was constructed first, with risers as normal from the L girder joists. Then these vertical 1"x2"s were glued to the inside of the roadbed only. The first level of track was laid. I used Atlas code 100 flex track in the helix, as it would be hidden from view. Then the second level of roadbed was fitted into place and glued into the slots, and the track laying continued. This procedure was repeated until the construction was complete to the top. Then the outside 1"x2" spacers were glued into place. The progress moved along quickly, and the resulting construction was very strong and stable. Because of the length of track involved, feeder wires were installed every half revolution by running heavy no.12 buss wires vertically, with smaller feeder wires soldered to the rails.

Summary

I have been in this wonderful hobby for over 36 years. My interests (and hopefully my skills) have evolved from the starter set of trains on a 4'x8' train table, with very generic themes, to become very specific, highly detailed modeling. Prototype modeling has opened my interests into other areas of historical research, photography, writing, architectural drafting, scratchbuilding, and electrical (well, a little bit anyway).

The goals of capturing the history, flavour, and scenes of a local railway line which is now only a memory, has rekindled and kept alive, the keen interest in a lifelong hobby for me.

Rich Chrysler