MODEL THE MOFFAT ELECTRONICALLY !

Software Architecture by Donald W. Karch

Reviewed by Frederick Bauer PE

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Among the Moffat devotees there are some remarkable HO layouts. Rand Hood's beautifully-detailed modules have graced the pages of *Model Railroader* and other magazines. Dick Oldberg's rather fantastic model requires a barn-size outbuilding. I have not had the opportunity to see others, but there is a whole colony of Moffat modelers specializing in three-dimensional wooden support structures, remote control, and brass engines. It is alleged they fantasize on the proper color of box-car red!

This article, however, is for the cerebral contingent lacking the room or energy to construct real-life layouts, *but who can thrill to a real life experience running trains down the 4% while carefully nurturing the brake line pressure, driving through snow, or pushing a plow train through Corona.* Suddenly you will understand the dilemma of engineman Watkins who lost control going downhill at Antelope in 1922. You will never experience Moffat railroading more realistically than guarding your high blood pressure and trembling hand as you avoid a run-a-way!

Don Karch has created a remarkable program - more about him later.

Overview:

This program for your PC computer replicates the Moffat from the Moffat Depot in Denver to Granby, circa 1928. This is not a game! It is real work with the same emotions as old-time Moffat enginemen.

It took my son and me nearly six hours to go from Denver to the end of the electronic track at Granby, a little longer than the actual timecard of the 1920's. Of course, shorter trips may be planned to suit your available time. Further, it is easy to go over the Hill in any season, with any consist, starting from any station, and returning home via the Hill or the Tunnel. You will need Microsoft Train Simulator to operate, together with free Moffat software from Train-Sim.com. You will also learn how to download the free software.

Locomotives, Equipment, and Stations:

Twenty-five stations have been placed on the route over the pass from Moffat Depot to Granby. Besides the more obvious, these include Utah Junction, Ralston, Leyden, Arena, Hotel Crags, Miramonte Hotel, and Frantz. Others, of course, are Denver Union Station and Winter Park.

Karch didn't build locomotives or cars since many are available from the Website at Train-Sim.com (more below), and many of those can be repainted and relettered for other road names, which he did. Most are Denver & Salt Lake, but some are Denver, Northwestern & Pacific, and you can supply your own.

Locomotives which are provided include 0-6-0 #20 and #21, 2-8-0 #101 and #102, 2-8-2 #400 and #408, 2-6-6-2 (sic) #203 and #216 (no prototype 2-6-6-0 is available), and 4-6-2 (sic) #300 and #303 (there is no 4-6-0 available). All except the 400's have tenders for both road names. Also available are two rotary plows, tendered for both road names. Because of issues with the files, the plows could not be numbered in the real 10200 series. The Red Devils (which turned black later) are designated #10101 and #10801.

There is also a pack of 19 D&SL passenger cars. Freight cars include cabooses, boxcars, reefers, cattle cars, flat cars, gondolas, hoppers, and tank cars. Karch reviewed all issues of the *Corona Telegraph* in developing these cars. There are more than 100 freight cars, with the differences being mostly in car numbers and loads rather than style of car.

Building the Route:

In constructing the line, Don Karch used U. S. Geological Survey DEM (Digital Elevation Model) files, *ie* datasets containing digital representations of topographic detail. There is one file available for every 7½ minute Colorado quadrangle, covering the same area as their quadrangle hard copy maps. Then came John Stanford, who devised a program to process these DEM files and convert the data into a form that Microsoft Train Simulator could use to create real terrain. Thus, the route has relatively accurate terrain on which to lay rails, always reflecting latitude and longitude, as well as elevation.

Although some route builders use more precise methods, Karch placed track by studying the detail on USGS maps, both on-line and hard copies, and tried to apply that to the terrain so as to minimize terrain adjustments. Various markers were placed to keep the track going where it needed to go. The method worked out rather well. For the portion of the route that still has rails today, details in a cab ride video were studied, and he walked the areas on the pass that are by-passed today, such as Ladora (with permission), the Loop Tunnel, and the Riflesight Notch Trestle. Care was exercised to cross rivers and creeks in the right spots.

Included also were the Tabernash by-pass, the Presidential siding at Fraser, and the hopper car windbreak on the Big 10 curve. Rio Grande hoppers were used for the latter instead of earth tone. The 1928 setting means that there are steam facilities along the route, and most buildings are older ones. Many miles of Denver suburban streets and buildings were avoided that did not exist at the time. It also means that the area between Union Station and the Moffat Depot is crammed with tracks, unlike today. Yards are based upon 1936 information to a great extent. The route includes reasonable representations of Prospect Junction, Fox Junction, Utah Junction, C&S Junction, and Tabernash yards. Included are the

CB&Q yards north of the 23rd Street Viaduct, and short leads to/from DRGW Colorado Springs, UP Cheyenne, CB&Q Chicago, and CB&Q Cheyenne.

After placing track, scenery items such as buildings were added. Many buildings were available from the original Microsoft Train Simulator and, more importantly, as downloads from Train-Sim.com. Selection was somewhat restricted by what was available, but in general the selections worked well.

Moffat Depot

Recreations of the Moffat Depot, several buildings across 15th Street from the depot, and the Arrow depot with its spur station track are truly outstanding. The time required for creation of the video art must have been enormous.

Special credit goes to another "Train-Simmer," Mark DiVecchio. First, he built several of the actual old buildings across the street, including the Prospero Frazzini & Brothers' Italian American Bank. His motivation was that the bank was owned by some of his relatives. He then offered to build the electronic Moffat Depot, if photographs and measurements could be provided. Karch got some very curious looks taking numerous measurements around the old station. The building is perfectly square, by the way. Mark also built the "Moffat Road" sign that was on the building adjoining the depot, and made a "Dining Room" sign for Arrow. All of these items are incorporated in the route. Renditions of the east and west portals of the Tunnel are equally skillful.

By the way, because of the work involved, Karch has made no plans to extend the route beyond Granby. That is a pity because of Byers Canyon, Gore Canyon, the Rock Creek trestle, and other sights you have learned that I treasure. Perhaps he can be persuaded! However, another Train-Simmer, Mark Hyams, is working on a Moffat Road route from Tabernash to Phippsburg. It is being built in a modern day setting.

The 1928 Window:

Karch decided to make his model circa 1928, a very wise choice in my view. It permitted him to model both the Hill Line over Rollins Pass, together with the Moffat Tunnel line. In actuality, such dual track arrangement lasted for only days, and to my knowledge revenue traffic never operated over both coincidentally. As noted in the D&SLHS publication, *The Roadmasters' Guide to the Moffat Road*, the Hill Line deteriorated remarkably over a short period of time. In designing the software, it was decided to extend passing tracks on the present day portion of the route to coincide with their current configurations. Thus the lap sidings at Pinecliffe are now double track.

The Tunnel occupied a critical role in designing the software. That is, the first electronic permanent track placement made in the 1928 configuration was the Moffat Tunnel. The rest of the route was built out from it in both directions. After careful measurement, it has the correct compass heading, and after several attempts, the correct portal locations -- which look quite accurate. The terrain even cooperated in providing the correct tunnel length, within ten yards or so. Complicating all of this was the correct upgrade and downgrade inside the tunnel. Users have been surprised to notice how their heavy coal trains pick up speed part way through the tunnel.

Non-Prototype Differences:

There are a number of situations where the electronic model does not match the actual. As mentioned above, the most outstanding is in the case of the series 200 engines. Because of the difficulty in building a new locomotive, the software author was forced to use an existing model. As a result, the real 2-6-6-0 locomotives turn out to be 2-6-6-2 on the screen. For the same reason 4-6-0, 300 series, engines are modeled as 4-6-2. This is noticeable only to a real devotee, and may not qualify your enjoyment at all. As mentioned previously, there are minor differences in equipment numbering.

Bridges are generally longer than in real life, caused by how the terrain developed, and in some places the program terrain called for major bridges where the video shows none. It was decided that the bridges would make it more interesting. The classic example of "route building creative license" is a massive three section fictional bridge between Tunnels 19 and 20.

Although track charts were available for the present day route, they were used sparingly. Curves and grades are not precise in some cases, but they get the overall job done. Normally, you would not notice any difference. The Big 10 curve is prominent, however, and is an actual 10 degrees; that was deemed important.

Although the real Moffat did not use road block signals, they are necessary in the computer program in order to run activities involving meets and passes with additional trains interacting with the one you are on. Karch was not willing, however, for signals to be seen on the Hill portion, so they are buried underground!

Regrettably, there are no snow sheds on the route.

Rainbow cut

Getting Microsoft Train Simulator:

Microsoft Train Simulator is necessary to run this program. It was formerly available everywhere for perhaps $30 or so. Then Microsoft started working on Version 2, and later lost interest. Now Microsoft no longer sells it, and most stores are sold out. As this is written, it is still available at Amazon.com for $9.99, and an Internet search suggests other sources as well. It comes on two CDs, with an easy automatic install. It takes

a while, with a little train chugging across the bottom of the window to show the progress.

Microsoft continues to maintain a support site, which offers updates to the original software, and other downloads. (http://www.microsoft.com/games/trainsimulator).

Good news is that Train Master Train Simulator is being developed and may be out within a year. It will be a major improvement over MSTS, and is being designed so that all MSTS items, like this program route, can be merged into it.

Required Hardware:

The primary issue for some would be required hard drive space. A full install (all six Microsoft routes) requires about 1.5 GB, while a minimum install requires 500 MB. The number goes up as various add-on routes and trains are added. Each route can require 200 to 500 MB of space. The Rollins-Moffat route takes 329 MB. Adding lots of locomotives and cars can take another one or two GB. All of the D&SL items take 83 MB. It's all the add-ons, however, that make the program worthwhile. Further, hard drives are getting noticeably cheaper and easier to add.

A 16 MB video card can be a real problem sometimes. A 128 MB video card will manage reasonably well..

Downloading Freeware
From Train-Sim.com:

The latest version, and perhaps the final one, is Version 4, which is available to all at no charge via download at Train-Sim.com. There have been over 3,000 downloads of the route from that site. It is not available from any other site, nor on a CD.

The easiest way to find any of the files that are needed for either the route or the rolling stock is to go to http://www.Train-Sim.com and navigate to the File Library. Then simply conduct a search for the word Rollins or Moffat, which will bring up a list of all relevant files. The route itself is made up of five files, each of which is about 25 MB in size. *A broadband connection is a must.* The various rolling stock files vary in size from about 1.3 MB to 14 MB.

To download from this site, you need to register, which is free, and get a user name and password. You will then need to compete with others for access, unless you elect to become a paid member, in which case access is assured. This is a great site, with thousands of downloads, lots of forums, and lots of information. There are several Colorado add-on routes available.

After you have downloaded the necessary files, follow the installation instructions that are included in the files.

About Donald W. Karch:

Don tells me that because of his long-time interest in railroads, he was happy to learn that Microsoft Train Simulator was released a few years ago. This allowed him to drive a variety of trains on a variety of routes using a personal computer. After buying it and learning more about it, he also learned that it was possible for a user to build his own routes for use in the program. He doesn't call it a game, because it's a lot more serious and time-consuming than a game.

Since Karch always had a special interest in the Moffat Road, and Rollins Pass in particular, he decided to build Rollins Pass/Moffat Tunnel Route for Train Simulator. Initially, the idea was to model only the pass, extending only to Rollinsville on the east and Fraser or Tabernash on the west. However, he

quickly realized that there was no way that the Moffat Tunnel could be excluded, and then realized that the route should be extended all the way to Denver. That wound up as the Moffat Road from Denver to Granby, with a choice of either taking the Hill Route over the pass or going through the Moffat Tunnel. It didn't take long to realize that others wanted his route too, once they learned that it was being built.

Growing up in Illinois, Don's first experience with the route was in 1954, when he came to Colorado on a vacation at age 12. The family stayed at Dwight Miller's Idlewild Lodge in Hide-a-Way Park, now part of Winter Park. He rode in a lodge tour bus up the pass at least as far as Loop Tunnel and Trestle, where the bus got vapor-locked. Later, he browsed through the lodge's copy of Rails That Climb. Auto trips took him to West Portal, the Tabernash yards, Fraser, Granby, and Kremmling. He says, "I never forgot it, or the Colorado Rockies, and remember the trip like it was yesterday." A few years later, he came to Colorado for college, and has been there ever since, except for two years in the Army.
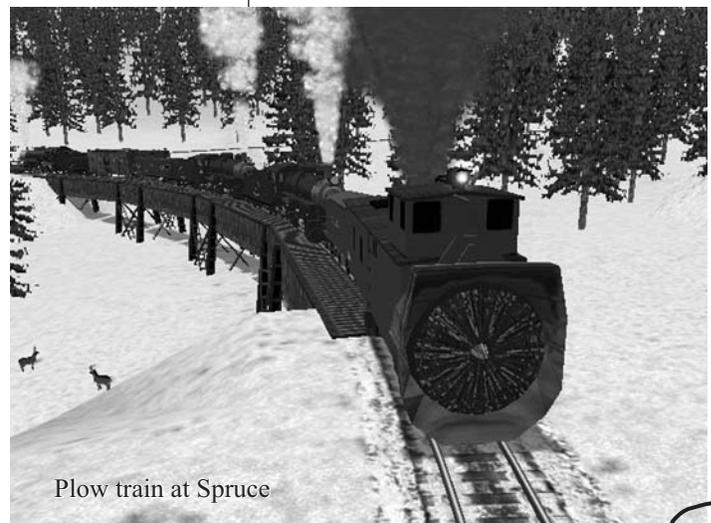
Don misses the days when it was possible to drive the entire Rollins Pass road, including Needle's Eye Tunnel and the Twin Trestles. The trestles were a bit scary, but he still gets up the Pass now and then.

Problems:

I have found no bugs in his program. Because of all of the track and buildings in downtown Denver, frame rates in that locality are quite low. That means the train does not always move as smoothly as it should, but jumps along in spurts, as old time movies did. A higher quality video card helps.

Two trains on the Loop

Plow train at Spruce