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UPDATING THE MDC BOXCAB

by Chuck Diljak

When my interest in model railroading was rekindled in 1990, it wasn't long before I discovered that my company, Ingersoll Rand, influenced the railroad industry in the early 1900's. Ingersoll Rand partnered with General Electric and Alco to develop the first commercially successful diesel locomotives in the 1920's. Ingersoll Rand provided the diesel engine, General Electric built the generator and traction motors, and Alco contributed the mechanical assemblies. The AGEIR Boxcab, as it came to be known, did not have a long production run, however. General Electric and Alco decided to produce their own line of diesel locomotives, bringing an end to the AGEIR partnership. For more information about Boxcabs, there is a terrific website at http://www.cnwhs.org/ageir/ageir.html.

Knowing that Ingersoll Rand had a hand in the development of diesel locomotives, I found an MDC Boxcab kit at a model train show in the early 1990's. Around that time, I was a member of the Ramapo Valley Railroad Club and was interested in what a fellow club member did with his Boxcab kit. He repowered the locomotive with a Northwest Shortline (NWSL) motor and added details, such as grab irons and lenses for the headlights. With the NWSL motor, the model ran better, but the gearbox assembly was still noisy. I was unsure about re-motoring the kit, but wanted to try detailing it. I began by shaving off the molded on grab irons and drilling holes for new wire grab irons. When I completed drilling the holes on one side of the shell, I realized that they were not straight, became disgusted, and put the kit away. I never really looked at the kit again, until this year.

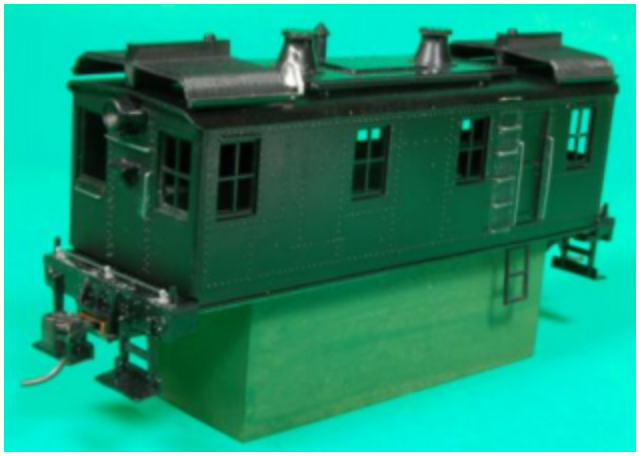
What made me bring the kit out of storage? Two things: The BLMA grab iron drilling jig and the new NWSL Stanton drives. With the BLMA drilling jig, I could re-drill all of the holes for the grab irons in a straight, consistent manner. And, the Stanton drives will allow me to remove the noisy gearbox and allow room for properly detailing the underframe. So, let's get to it!

Grab Irons and Railings

The first thing I did was correct the sins from my previous attempt. Using Squadron Green Putty, I filled in the holes I drilled in the 1990's. Then, using the BLMA drilling template, I drilled new holes for the grab irons. The nice thing about the drilling template is that it has holes for various sizes of grab irons.

Model Die Casting produced two variations of the shell. The ends of the Boxcab shells come with or without doors. The shell on my kit did not come with doors on the ends. And, they do not have any molded on grab irons on the ends. Yet, the prototype for my shell had three grab irons of different lengths and locations on the end. I decided to bend my own grab irons using .015 music wire and the BLMA drilling jig. Turning the drilling jig sideways allows you to get longer lengths for a grab iron. Instead of using the paired holes for

a grab iron, you are pairing the holes for multiple grab irons on the jig. After determining which holes line up the closest to the lengths I needed, I used the jig to drill holes in a scrap piece of .060 styrene. Then, using a NWSL Chopper, I cut through one of the holes. Now you have a jig where one of the holes is in the middle of the styrene scrap while the other is half a hole on the edge of the styrene scrap. I bent one end of the .015 music wire at a 90 degree angle and inserted it into the hole that is in the middle of the styrene scrap. I lined up the music wire with the half hole along the edge, place a pair of pliers to firmly hold the wire at the edge, and then bent the wire at a 90 degree angle. Using a hard wire cutter, I cut the bent grab iron off. Using the BLMA drilling jig, I located and drilled the appropriate holes on the ends of the shell. Note that there is one long grab iron right above the sand hatch in the center of the end placed horizontally. Then, there is another shorter grab iron right below the engineer's window. And, a third grab iron is located vertically to the right of the sand hatch.



The pilot for the locomotive has a railing and coupler lift bar. I decided to only model one of the items, the railing. But, I did use the castings in the coupler lift bar parts kit to hold the railing. Before installing, I removed the three small nubs that are on the pilot. These are supposed to represent the holders for the coupler lift bar and railing. But, the use of these nubs for this purpose would be too difficult. So, after removing them, I drilled holes for the castings in the same location. After gluing the castings from the coupler lift bar kit in place with ACC, I slid a length of .015 music wire through the holes in the casting for the railing.

Bill of Materials

Number	Qty	Description
		American Model Builders
9200	1	GE-Alco Sideframe Kit
		Atlas
BL151003	1	Coach Center Sill & Brake Gear
		BLMA
176-4500	1	Grab Iron Drill Template
		Detail Associates
229-2204	1	Coupler Lift Bar with Bracket
229-6210	1	Freight Car Grab Irons
		Details West
235-128	1	Bell
		Evergreen Scale Models
9005	1	.005 Clear Acetate
9060	1	.060 Sheet Styrene
9080	1	.080 Sheet Styrene
128	1	.020 x .188 Strip Styrene
		Grandt Line
5100	1	Nut-Bolt-Washer
		K&S Engineering
370-498	1	.015 Diameter Music Wire
		Micro Mark
84985	1	Rivet Decals
		Miniatronics
475-1231005	1	3mm Yeloglo White LED's
475-5000102	1	2 Pin Micro Mini Connector
		Model Die Casting
480-2810	1	Box Cab Diesel Kit
		Northwest Shortline
39259-4	2	Stanton Drive 7' Wheelbase 38" Wheel
		Precision Scale
585-31055	2	24" Diameter Riveted Air Tank
		Train Control Systems
A6X	1	6 Function Decoder

The final modification I made was to the shell. Both sides of the shell have a "toolbox" in the center. The prototype did not have these. Instead, MDC used their manufacturer's license in order to have a way of attaching the shell to the frame. The stock gear tower that is attached to the frame has tabs that snap into the toolboxes. Both of the tool boxes were removed, making way for the air tanks and brake cylinder that will be installed, later.

Paint and Decals

I used decals for my Wyoming Valley for the mark-ings. The number 1000 is in honor of the first AGE-IR Boxcab used commercially, number 1000 on the Central Railroad of New Jersey.

After cleaning the shell to remove any oils, I sprayed it with a fine coat of Gloss Cote. I then applied rivet decals in locations on the shell where I removed cast on rivets when removing the molded on grab irons. Then, I glued in place all of the grab irons, cutting off the ends of the grab irons so that they would not interfere with the underframe when the shell is attached. I also attached the bell, smoke stack, pipe, and covers for the "Squat- Pot" type exhaust stacks with ACC. Do not attach the radiator castings at this time.

Note that the front end of the locomotive is the end where the bell is closest. Also, the “Squat- Pots” need to be positioned where they are closer to the front end of the locomotive and glued in place.

I airbrushed the shell and radiators with Pollyscale Steam Power Black followed by another fine mist of Gloss Cote. I then applied the decals for the Wyoming Valley. Once the decals had set, final coats of Gloss Cote and Dull Cote were applied. When dry, the bell was painted a brass color. The radiators were finally glued to the shell using ACC. The radiators are oriented so that the fill cap is located furthest away from the ends of the Boxcab shell.

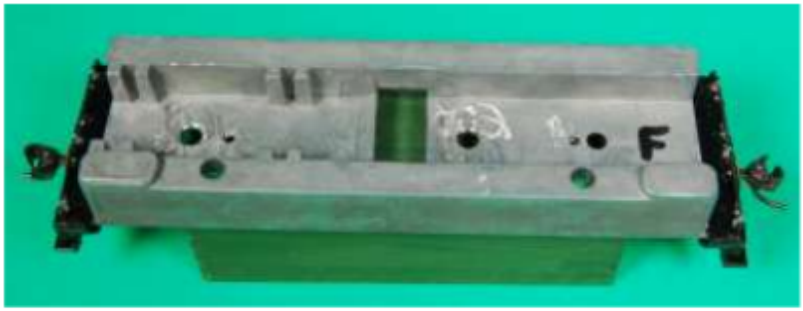
Repowering and Electronics

When you look around on the internet, you will find many people have repowered their Boxcabs using a Bachmann 45 ton locomotive. A portion of the Bachmann 45 ton Center Cab frame drops down in between the trucks. Since that is where the air tanks and brake cylinder go, I could not use it. Fortunately, NWSL now produces a Stanton drive, a self-contained motorized truck.

Yeloglo white LED’s by Miniatronics were used for the head-lights. The molded on headlight casting needs to be drilled out to accommodate the LED’s, Using progressively larger drill bits, I drilled out the headlight casting until the last drill bit used was 7/32” in diameter. Then, I finished up the holes using a round file until the LED’s would press fit. Using the 2 Pin Micro Mini Connector wire from Miniatronics, connections were made between the LED’s and the TCS decoder. The 2 Pin Connector wire allows me to remove the shell by unplugging the LEDs. This decoder has multiple connections depending on if you are using 12v, 1.5v, or LED’s for lights. The resistors needed for each type of bulb are built into the decoder.

The Stanton drives I selected for this project have a 38” diameter wheel and 7 foot wheelbase. The prototype had a 7’ 2” wheelbase and either 36” or 38” wheels. I modified the Stanton drives by removing the coupler pocket. I painted the face of the wheels with Pollyscale Roof Brown. I next determined where the holes needed to be drilled in the frame for the kingpin on the drives. The scale drawing provided is meant to fit inside the top of the frame. You will need to notch the drawing in a few places to fit around cast -in guides intended for the stock motor and drive system. Using an awl, I transferred the center point through the drawing onto the frame. I drilled holes for the kingpin using a 5/64” drill bit. The NWSL instructions say to drill a 4mm hole, which is larger than the 5/64”, to accommodate the boss that is part of the drive. Surrounding the boss are two washers that can be removed to adjust the height of the locomotive. Since I did not need to adjust the height and one of the holes drilled for the kingpin comes very close to a hole already in the frame, I decided to only drill a 5/64” hole to fit the kingpin instead of the boss.

.827”	2.286”	.827”
	.325”	
Kingpin Template	**In HO Scale**	



▲The frame, with holes for the Stanton drive and decoder wires. Note the “F” to identify the front end of the frame.

The frame already contains a hole that can be used to insert the wires from one drive to the decoder. Drill a second hole between the kingpin and the end of the frame for the other drive. This will keep both drives oriented the same way and allow you to follow the NMRA standard for wiring the decoder.

I cleaned up the flash on the side frames using files and sandpaper. I also removed the nubs that are on the backside of the side frames, which are used for mounting a clear spacer that came with the side frames. Instead, I attached a strip of .060 x .080 styrene strip as a spacer to the back side of the side frame by using epoxy. I attached the fatter side of the strip to the side frame.

The side frames were painted Pollyscale Tarnished Black. I also dusted the brake shoes with Bragdon’s rust colored weathering powders. I also brush paint-ed the red and orange wires that are visible inside the drive housing. With layers of scrap .080 and .010 sheet styrene butting up against the wheel faces, I was able to center and level the side frames against the Stanton drives. I used epoxy to attach the side frames to the drives.

▲The NWSL Stanton drive with AMB side frames. Note the "F" to denote which end faces the front of the locomotive.

Final Details and Finish

Sam Berliner’s website has photographs of CNJ Boxcab number 1000’s air tanks and

brake cylinder that are mounted to the frame. You can find this webpage at http://sbiii.com/boxcnjp1.html.

▲*The air tanks and brake cylinder, after installation.*

For my boxcab, I chose to model the 24” diameter air tanks as riveted versions, as shown in other prototype photos. I used Precision Scale tanks, one mounted parallel to the edge of the frame and the other mounted perpendicular to the first air tank, in the middle of the frame. The Precision Scale air tank kit provides a length of brass tubing, allowing your air tanks to be any length. Based on the drawings, I cut the tubing so that the overall length of the tanks, including the cast ends in the kit, equaled five feet in length. Before installing the air tanks, I glued pieces of .060 and .080 sheet styrene to fill in the center area of the frame, where the MDC gear tower would have been installed. The combination of these two pieces of styrene should provide a surface that is level with the bottom of the frame. I installed .015 wire as piping to the tank that is on the edge of the frame, one at each end. I bent the wire so that the other end disappears behind the edge of the frame.

The brake cylinder in the photos is a rather stubby version. And, it appears that “16x12” is emblazoned on the prototype photo. When looking for a 16” brake cylinder, I uncovered references to a UC brake system. I also found a reference to the Branchline Pullman underbody parts having an 18” brake cylinder. The same reference stated it is actually closer to 16”. The nice thing about the Branchline underbody parts is that the levers and cylinder are cast as one part. Before using the Branchline casting, I removed the additional piping that is attached, since I did not see them in the prototype photos. I cut a piece of .020 x .188 styrene strip to fit in between the flanges of the brake cylinder. Then, along one edge of the styrene, I drilled three #78 holes and inserted Grandt Line NBW’s. This will serve as the mounting bracket for the brake cylinder. The photo shows how the tanks and brake cylinder were oriented, with the brake cylinder being on the engineer’s side of the locomotive, when considering which end is the front.

The frame was airbrushed with Pollyscale Steam Power Black, just like the shell. I removed the LED’s from the shell in preparation for weathering.

The weathering consisted of a thinned spray of Pollyscale Earth along the bottom of the shell and the frame. I followed this with a thinned spray of Polly-scale Grimy Black.

▲*The brake cylinder side of the finished boxcab.*

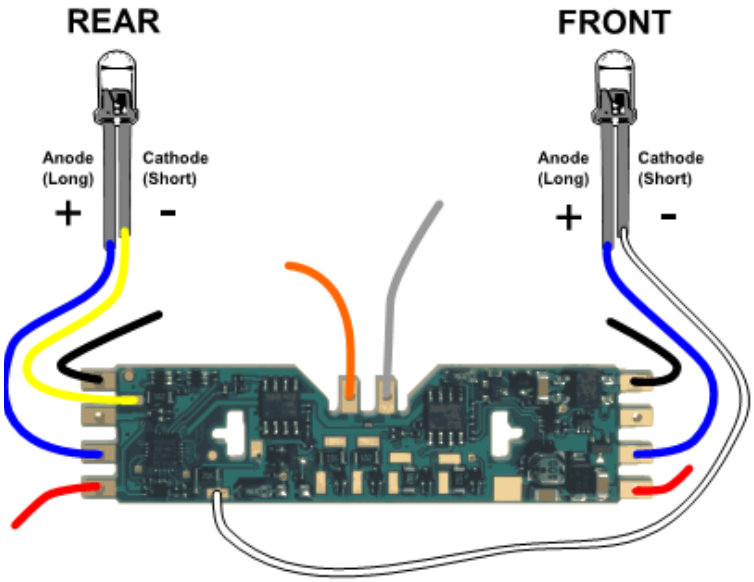
I installed acetate for all of the windows and then reinstalled the LEDs. All that was left was to solder the wires from the drive units to the decoder. Once that was done, I tweaked the decoder settings to improve its operations, working with the acceleration and deceleration settings since there are no flywheels in the unit, and the dimming functions for the LEDs.

Many of the boxcabs spent their useful lives working in freight terminals and industries. Wyoming Valley number 1000 is no exception. It will spend its days working the Lunde anthracite colliery.

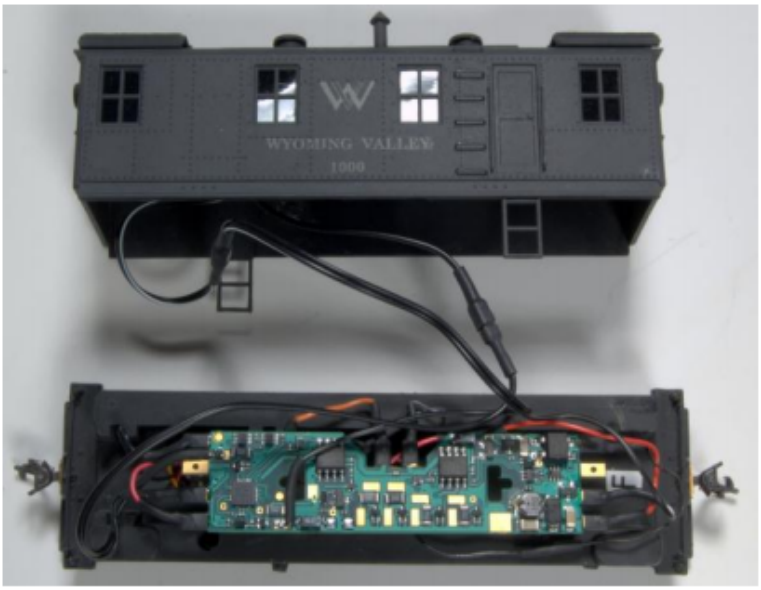
Adding DCC

I’m a neophyte when it comes to electronics. It is an area of model railroading I do not understand. I am always happy to be able to hook up two wires to a component and be on my way. But, if you add a third wire, resistors, capacitors, LED’s, or just about any other electronic component to the mix, I am lost.

As I was working on the MDC Boxcab, I realized that the A6X decoder from Train Control Systems (TCS) would be perfect for the job. The main reason I was excited about using it is that the decoder already has all of the electronic components built into it for various lighting options: 12v bulbs, 1.5v bulbs, and LED’s. I wanted to use 3mm LED’s from Miniatronics for the Boxcab. And, normally, when you use LED’s in an application, you need to also install resistors. The A6X decoder already has the resistors built into the board. So, it was only a matter of soldering wires from the LED leads to the correct soldering pads on the decoder board.



▲*The author's wiring diagram for the TCS A6X decoder.*



▲*The photo above shows the MDC Boxcab with the shell removed from the frame, exposing the wiring and TCS A6X decoder.*

The other brilliant advantage, although minor, is the A6X decoder has two soldering pads for attaching the blue common leads from the LED's.

Since I wanted to be able to detach the shell from the frame, if I ever needed to service the locomotive, I used 2-pin Micro Mini Connectors from Miniatronics for the wires from the LED's to the decoder board. This is optional, but I like to plan for contingencies. In order to prevent errors in reconnecting the wires, one pair of wires is oriented so that the section with the male plug is connected to one LED. The other LED has a section of wire with the fe-male plug. If you are installing a different decoder that has only one lead for the common, twist the two blue common wires together and solder them to the decoder and use resistors.

It was also important to make sure the frame and the shell were properly identified as to which end was the front of the locomotive. I attached a label with an "F" to the top of the frame. The locomotive shell has an "F" decal in the lower right corner of the exterior, as per prototype practice, to designate the front of the engine. Both can be seen in the accompanying photo.

The wiring diagram also denotes, by color, how the wire leads from the NWSL Stanton drives are soldered to the board. The decoder board provides two pairs of soldering pads to connect the red and black wires. However, the orange and gray wires from each truck need to be twisted together and soldered to the pads near the center of the board.

Once the LED's and motor leads have been soldered to the board, I tested the locomotive to make sure the lights worked and the engine ran. Once I was satisfied, it was time to program the locomotive.

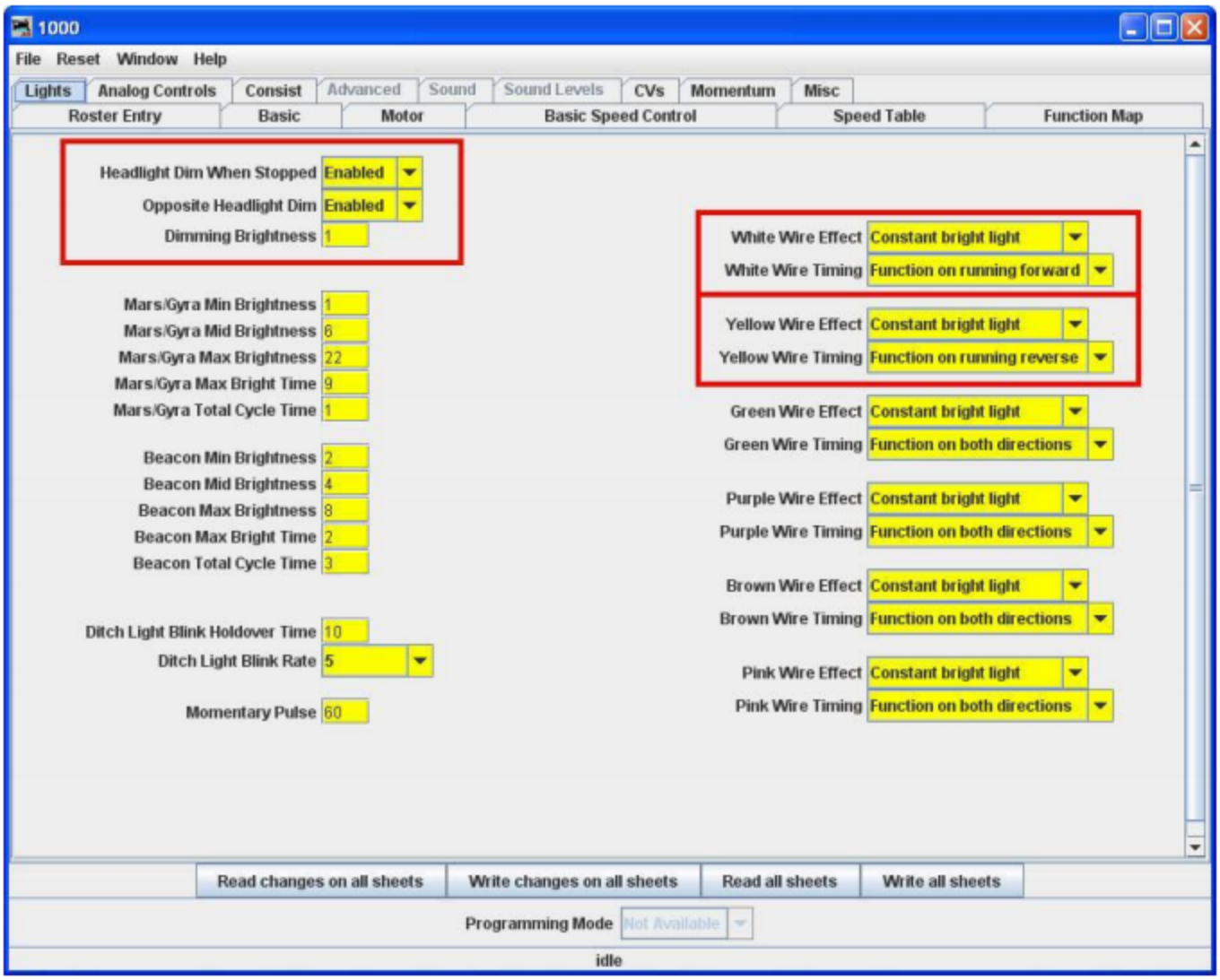
I use Digitrax as the DCC system on my layout. And, a few Digitrax-using friends kept telling me to use DecoderPro, freeware software for programming decoders. Check the DecoderPro website to make sure it supports your DCC system.

To use DecoderPro with Digitrax, you need to purchase the LocoBuffer component from RR-Cirkits that connects the Digitrax Loconet to your computer. I have no idea why I waited so long to make this investment, but it sure has simplified programming decoders and I will never go back to the old days of programming through the throttle.

DecoderPro makes it easy to program the decoder without knowing which CV to update and which value to update it to. I usually start off programming a new decoder by setting the locomotive on the programming track, identifying for DecoderPro the decoder that is installed, and then assign the decoder a unique address. Placing the locomotive on the programming track prevents you from updating all the locomotives on your layout, by accident. Once you have assigned the decoder its address, you can then place it on the layout and adjust other decoder settings and see the results, quickly.

For the Boxcab, depending on the direction of travel, I wanted to have the lead headlight at full brightness and the trailing headlight dimmed. The screen shot from DecoderPro shows the tab and options I changed to make this happen. By switching to the motor tab,

I also experimented with the settings for the motor to improve its operation.



▲ ***A screen shot from DecoderPro, showing the Lights tab with the items modified by the author outlined in red.***

Electronics manufacturers continue to make things easier for model railroaders. With improved DCC decoders and easy to use software, it makes an electronics neophyte like me enjoy this hobby more.