Model Railroad Hobbyist |

DCC IMPULSES

column

BRUCE PETRARCA MMR

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Can I adjust my DCC decoder's personality easily?

"Programming a decoder" has many model railroaders thinking of geeks in white lab coats in a room full of flashing lights. That's why I avoid the term "programming" in favor of "setting" or "adjusting personality." Heck, "training" is better, in my mind.

Let's see what we can do to blow away the fog.

For starters, there are two versions of programming: setting personality and loading sounds. I covered sound loading in a prior column (model-railroad-hobbyist.com/magazine/mrh2016-08-aug/dcc-impulses). Here we'll just be talking about training the decoders not loading sounds.

Okay, there are a few initial steps to get you to where you can fine tune your decoder to your own desires. You need to be communicating with your decoder. Let's get that communication set up.

The initial step is to assure that you can talk to your DCC system command station. This communication can originate from a cab connected to the command station or from a computer. Let's walk first, by working initially with a cab. Then we can run with the computer.

1. Using a DT400 cab to communicate with the decoder. *Bruce Petrarca photo*

Using a cab to communicate

To assure that you are talking with your DCC command station [1], put a loco with a decoder installed on a (running, not programming) track and make sure you can control it. Running it forward and backward will suffice.

Types of programming

There are two places to program your decoders on most DCC systems: on the programming track and on the main track where you run your locomotives.

Most of what we'll discuss here relates to the programming track, also called service-mode programming. Beforehand, I'd like to share a few thoughts about programming using the main track (POM).

There is a 99% chance that if you are programming using the main track that you will not be able to read what is stored in the locomotive. That remaining 1% will involve sophisticated DCC systems with either RailCom or Digitrax Transponding bidirectional communication.

POM utilizes the decoder's address to tell one specific decoder to make a unique change. Blast-mode is a special case of POM and is activated by selecting address zero. On supported systems, this blasts the change to every locomotive on the layout.

So, verifying that you have selected the decoder you want to program is very important. If you enter an incorrect address and there is not a corresponding locomotive on the layout, nothing will happen. A message will be sent but nobody will respond. You will have no notification that the message just fell on the floor. If the address is set to zero, you may set every locomotive on the layout to the characteristic in the command issued.

2. Track connections on Digitrax DCS100. The "main" track connects to RAIL A and RAIL B (right side of the grey connector). The "programming" track connects to PROG A and PROG B (in the center of the same connector). *Bruce Petrarca photo*

How do I use the programming track?

Set a locomotive with a decoder on the programming track. The programming track should be the only one connected to the programming track outputs (PROG A and PROG B in [2]). To verify that you are programming the locomotive on your programming track, select page-mode programming and read CV 1 (the short address). You are very likely to get an answer of "3". You should get an answer between 0 and 127. In most cases, the locomotive will jerk slightly when the CV is read.

If you don't get a correct value read back, troubleshoot your setup until you do. For example: check your cab connection and your track connections. Make sure you have the locomotive on the programming track. Check for clean track and wheels. Try another locomotive, preferably one without a sound decoder or without a keep alive module. If you are successful in reading this alternate locomotive, you may need a Programming Track Booster to read the original decoder.

3. Soundtraxx PTB-100 Programming Track Booster.
Bruce Petrarca photo

Programming Track Boosters (PTBs)

PTBs are circuits that connect between the DCC command station and the programming track. They don't really boost anything, but interpret the signals between the original NMRA specification and a later variation, designed to accommodate reading from newer decoders. Decoders with a lot of energy storage, such as many sound decoders and those with large keep alive modules or capacitors, may need a PTB. Newer command stations may not need a PTB with many, or all, decoders.

A PTB won't damage a decoder connected to it, whether the decoder needs a PTB or not.

Some PTBs may cause issues with some command stations that don't need them. Check with other users or the manufacturer of your system to see if you need one. For more information, see my July 2012 column (model-railroad-hobbyist.com/magazine/mrh-2012-07-jul/dcc_impulses).

So, now if you have all this together, you can use your cab to set up your locomotives and keep a notebook with all the changes you made to your roster. There are online tutorials as to how to work with those complicated indexed CVs, such as 2.503. Of course, you will still have to deal with the various programming track modes, such as page, direct-bit, and direct-byte. Do you know which mode your decoder prefers?

Didn't you promise an easy way?

Yes, I did. But first we needed to get everybody in your system working together. If you jumped to this section looking for a simple solution, I need to send you back to the beginning to work your way up to this point. The early part of this column was essential to getting communication established.

The easy solution is to let a computer do repetitive things and remember what it has done for you. That's what they are good at doing.

4. Computer interface LocoBuffer-USB for Digitrax command stations. This was a prior installation at our club (pcmrc.org). The LocoBuffer-USB has since been moved behind the fascia panel and connected to one of the rear jacks on the UP5 panel. *Bruce Petrarca photo*

In order to get a computer working for you, we need to get it talking to your DCC system. There are interface modules [4] to do this. They are generally specific to a specific manufacturer and, sometimes, a specific system within their product line. Detailed instructions for every system exceed what can be covered in one column. But I get ahead of myself.

Here's why you'd want to have your computer talking to your DCC system. In addition to simplifying decoder personalization, you would be able to:

- Use smartphones and tablets to run locomotives and throw turnouts,
- Build layout control panels that can control turnouts and signals,
- Fully signal your layout, and
- Share your loco roster between computers anywhere in the world.

One package will let you do all of this: JMRI (JMRI.org). It will run on any desktop or notebook computer that:

- has a USB port and
- can run Java (the full version, not the run-time version used for browsers)

It matters not whether you are using Windows, Mac OS X or Linus.

I am unaware of tablets or smartphones that meet all of these requirements. I'm told that Microsoft Surface units will, but I don't consider them a tablet, but a small notebook. If you have a setup that works, please share it with all of us in the blog associated with this column, by clicking the Reader Comments box at the beginning or end of this column.

As you can see from the list here, which is a partial list of what it does, JMRI is very complex and powerful. I'm not going to try to discuss all the features here. I'm just focusing on a sub part called DecoderPro. From the JMRI.org website, there are a lot of pages with information about computer interfaces, DCC system compatibility, help for different features, etc. Check them out.

How expensive is such a powerful program? It is shareware. That means that it is free to download and install. Donations (jmri.sourceforge.net/donations.shtml) are appreciated. I recommend that everyone who uses DecoderPro, or any part of JMRI, donate $10 every year. If all users did, things would be peachy-keen.

Once you have DecoderPro running on a computer connected to your DCC system, you will be able to ignore CV numbers, even those pesky indexed ones. You simply go to the tab (Sound Level, for example) and adjust volume using a slider and write the changes to the decoder. If you are doing this on the main (POM), you hear the results immediately and can tweak to the N^{th} degree. Great for speed adjusting.

Besides, DecoderPro knows what mode (language) your decoder hears the best (paged, direct-bit, etc.).

5. DecoderPro roster page.
Bruce Petrarca screen capture

DecoderPro automatically saves the configuration for your locomotive in a file. These files are indexed in what is called a roster (a list of all your locomotives). Copying the roster files to another computer or a backup disk will help protect against data loss. If the decoder looses its mind or is replaced with the same model, resurrecting your locomotive settings is as simple as opening DecoderPro and clicking on the WRITE ALL SHEETS button.

This feature can be used as a starting place for making multiple decoders identical, perhaps later changing the addresses for different locomotives. Imagine if you could weather a single iced reefer and have the computer make all the rest of yours look the same, allowing you to only need to add a few tweaks to make the fleet look similar, but different.

Enough sales pitch, let's get into the details.

How do I setup DecoderPro?

You need your DCC system talking to your loco and your computer talking to your DCC system, as I discussed in the beginning of this column. If you don't have that, go no further. Go back to the beginning and read the details, perhaps even clicking on the links to other columns of mine.

In internet connection is not needed for the computer you will use, but it is helpful during the setup phase. If needed, the desired files can be copied to a memory stick or disc and run from there. However, here I'm going to assume an internet connection.

First, go to java.com/en/download/installed8.jsp on the computer you'll be using and test for the latest Java release.

Note to Windows XP users. Java version 8 will run on XP even though the web site will tell you it is not supported. Just tell it to install it anyway. The only Windows computer I have is XP and I just loaded Java onto it yesterday.

Once you have the latest Java installed and verified, download the JMRI package for your operating system and install it on your computer. I

recommend the production releases, not the test releases. Directions are on the jmri.sourceforge.net/download/index.shtml website.

Understand, I've done all this for many versions of both Windows and Mac OS X. Linux may or may not be the same. I've never played in that court. However, Windows and Mac OS X are the vast majority of installations.

The JMRI web site (jmri.org/help/en/html/setup/index.shtml) has lots of setup questions answered.

Note for Mac users. When you are selecting the serial interface in the basic setup, look for names like "/dev/cu.KeyUSA19181.1". There may be similar names "/dev/tty.KeyUSA19181.1". Be sure to use the "cu" version.

6. DecoderPro Icon. ***Bruce Petrarca screen capture***

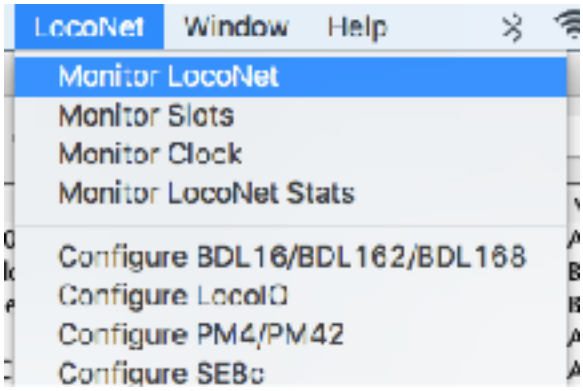
Fire up DecoderPro by clicking on the icon that was installed on your computer with JMRI. The PanelPro and SoundPro icons will open the same program, but put you in a different place. Think of three doors into the same house, one puts you in the living room and one puts you in the kitchen and one puts you into the garage. Same house, different rooms.

When the DecoderPro home page opens, you should get green text at the bottom of the page verifying that the computer is talking with the computer interface and the DCC system. You may see something like:

Service Mode Programmer NCE PowerCab is Online
Operations Mode Programmer NCE PowerCab is Online

To verify that you have DecoderPro communicating with your DCC system you can open the function that shows you what commands are passing along the DCC system you have connected and see if it reports commands moving.

7. Monitor LocoNet selection to verify Digitrax system.
Bruce Petrarca screen capture



For example, with a Digitrax system [7], use the LocoNet tab at the top of the home page to bring down the menu, then click on the MONITOR LOCONET tab. Other DCC system manufacturers will have a similar tab located in the same place on the menu bar as the LOCONET, but named differently.

8. Monitor LocoNet window when first opened. *Bruce Petrarca screen capture*

You should see a pane like [8]. Select a locomotive with a cab on the system and try to run it. You won't actually need a locomotive on the main track, because your system will send commands whether there is a locomotive or even some track connected. You should see commands like [9]. If so, you can move on. If not, troubleshoot your connections until you do.

9. Monitor LocoNet window with some commands issues.
Bruce Petrarca screen capture

How do I set up my first locomotive?

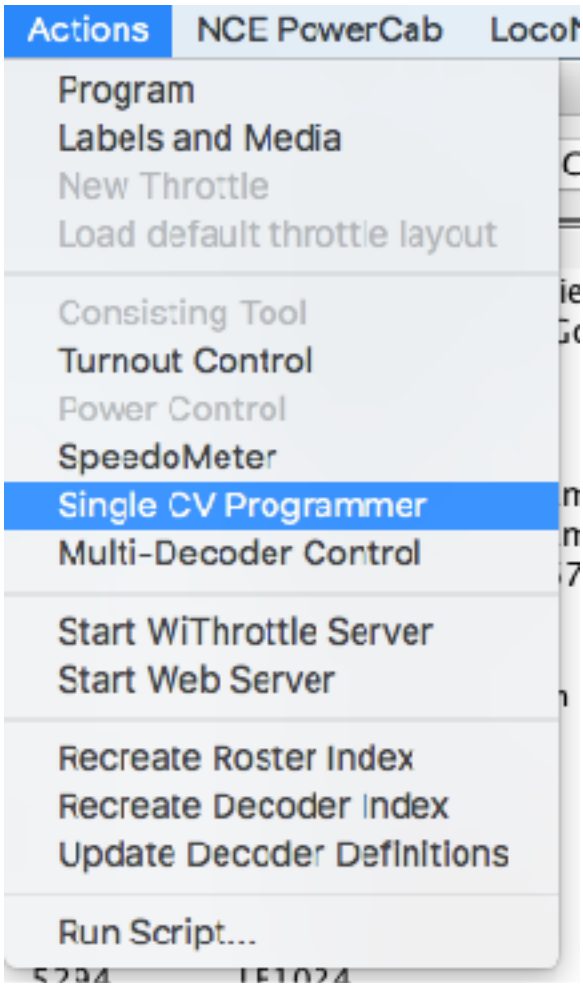
With DecoderPro open, put a locomotive with a decoder installed in it on the programming track, not the main track.

Use the ACTIONS tab at the top of the home page to bring down the menu, then click on the SINGLE CV PROGRAMMER tab [10].

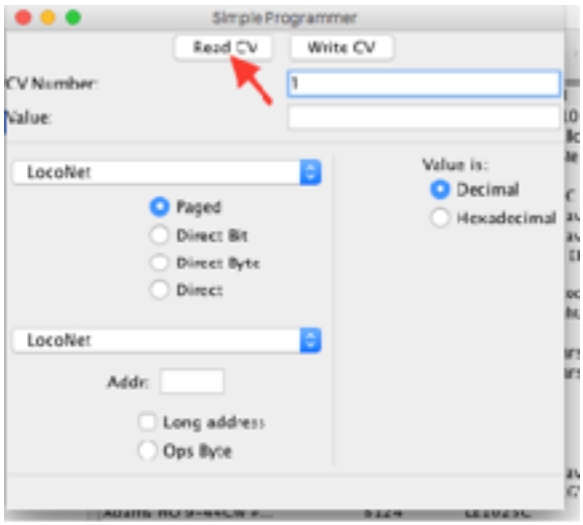
10. Single CV Programmer selection menu. *Bruce Petrarca screen capture*

For the maximum compatibility at this phase, leave the programming mode selected as PAGED [11].

Enter CV = 1 and press READ CV [11]. The answer will likely be 3. If it is any number from 1 to 127, all is probably well and JMRI is hearing the decoder. This is the short address as stored in the locomotive, even if you are using the long address.

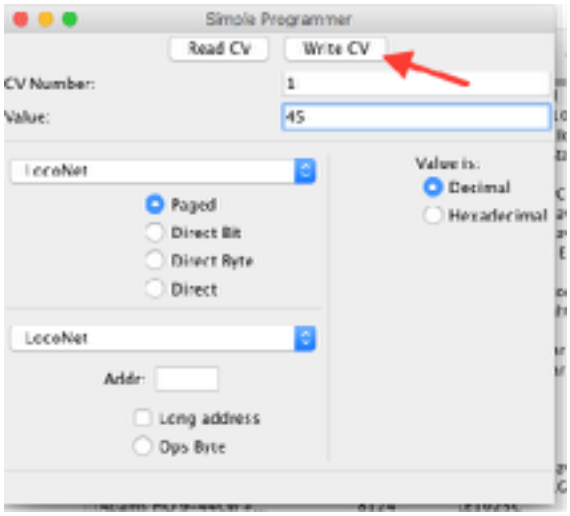


11. Simple Programmer window CV 1 selected, ready to press the READ CV button. ***Bruce Petrarca screen capture***



Now prove that the decoder is hearing JMRI. Enter a different short address (1 to 127) into the single CV programmer (I suggest the last two digits of the locomotive cab number - using 45 as an example) and press WRITE CV [12].

12. Simple Programmer window CV 1 ready to program 45 by pressing the WRITE CV button. *Bruce Petrarca screen capture*

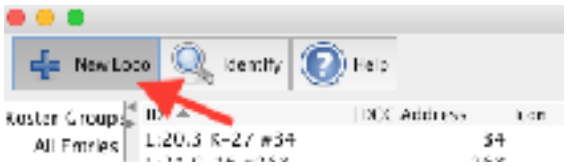


Now, press the READ CV button. You should read back the CV you entered (the screen will not change). If so, all is well and you can proceed to set up the locomotive.

If you have successfully changed the short address in the decoder from something that you want to use, now is a good time to change it back.

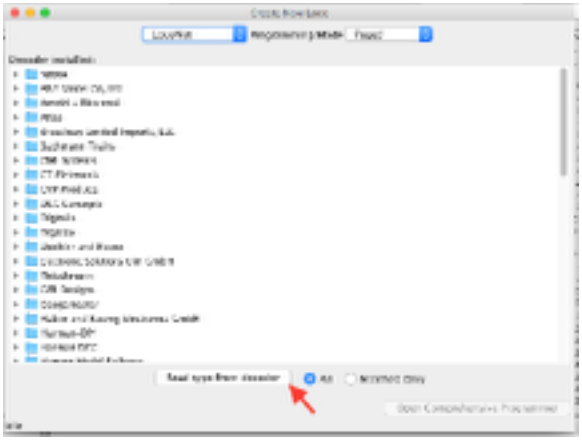
Initial setup of a locomotive

13. Initial setup of a locomotive - selecting a NEW LOCO. *Bruce Petrarca screen capture*



From the roster page, press + NEW LOCO [13], which will bring up a decoder selection page. Press READ TYPE FROM DECODER [14].

14. Asking DecoderPro to read the decoder type. *Bruce Petrarca screen capture*



DecoderPro should read several CVs return a list of decoders that correspond to the manufacturer's ID and version ID that were stored in the decoder as it was built.

Manufacturer ID numbers (stored in CV 8) are assigned by the NMRA. The manufacturers decide on their own version ID, stored in CV 7. Thus, JMRI may be able to identify down to a specific decoder in one case and, in another situation, only be able to tell the manufacturer and offer a smorgasbord of choices.

The second situation results from the manufacturer using the same version number in many different decoders. The user is left to choose the closest match from the list [15].

15. DecoderPro offering a smorgasbord of decoder choices. *Bruce Petrarca screen capture*

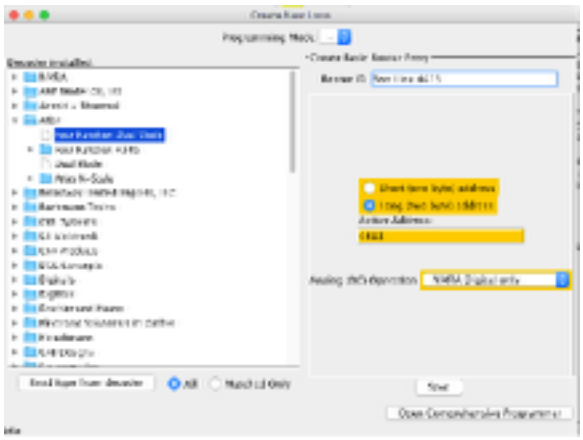
If only one decoder is highlighted, you are in tall cotton. If multiple versions are selected, as shown in [15], you will need to decide which decoder you have. In this case, the loco was an Atlas HO scale and not a H15-44 or H16-44, so I selected "Four Function Dual Mode" by clicking on it.

Once the decoder is selected, a second pane is added to the window [15], as shown in [16]. I chose a roster name ("Soo Line 4413), answered the questions (shown in yellow), and hit SAVE.

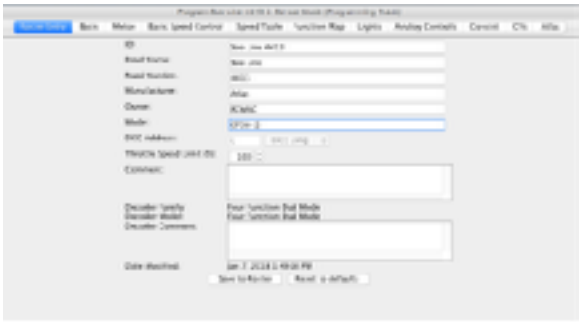
I recommend NMRA DIGITAL ONLY or whatever no-analog choice there is for the DC Operation window.

Then I clicked on OPEN COMPREHENSIVE PROGRAMMER to get to work customizing the loco [16].

16. Decoder selected and ready to save the basic information to the roster. *Bruce Petrarca screen capture*



17. ROSTER ENTRY tab filled out. Bruce Petrarca screen capture



The locomotive pages open to the ROSTER ENTRY tab [17]. (The tabs are across the top of the window and end with the ATLAS tab.)

I entered the data shown and hit SAVE TO ROSTER.

18. Filling out the BASIC tab. *Bruce Petrarca screen capture*

The BASIC tab [18] is where you teach the locomotive its name (address) and some basics of its operation. I recommend “28/128 speed steps” and “NMRA Digital only” as settings for all decoders.

The locomotive direction is designed to reverse operation, such as when a loco is permanently used facing against the direction of travel, such as the trailing unit in an ABA consist. It is not useful in fixing wiring errors, such as the motor gray and orange wires reversed. If you do that, man up and go back in and change them. Flipping the direction here will reverse the motor, but now the lights will be backwards.

When you have it all the way you want, click on WRITE FULL SHEET, which will move the settings into your decoder.

A quick mention of the colors shown on DecoderPro panes.

White is data that has been proven to be the same both on the computer and in the decoder. This means that it has been written from the computer (but not verified by a readback) or has been read from the decoder.

Orange (either outline or background) means that the data has been changed on the computer but not yet written to the decoder.

Yellow means that the data was retrieved from the computer but has not been written to the decoder or read from it. In other words, not a guarantee that the decoder has that value stored.

19. READ ALL SHEETS to load the decoder settings into the computer.
Bruce Petrarca screen capture

After the settings are stored in the decoder, the sheet will look like [19]. The next step is to press the READ ALL SHEETS button.

This will cycle through the entire decoder and read all values into the computer file. This may take a minute or several. If you are reading a modern complex sound decoder, go get a cup of coffee or a light lunch.

Once DecoderPro has finished reading all the sheets, save the file on the computer. One of the easiest ways to do this is to close the locomotive window. You should be prompted [20] to determine your desires. Select SAVE AND CLOSE. That should bring you back to the DecoderPro Roster window [5].

20. Closing a locomotive file will bring up this prompt to exit. Choose SAVE AND CLOSE to make sure the data is saved on your computer. *Bruce Petrarca screen capture*

How to tweak a loco saved in DecoderPro.

From the roster screen [5] highlight the desired loco. Then, in the lower right corner of the screen [21] select the desired programming method and press the PROGRAM button.

21. Selecting programming mode from the roster screen in DecoderPro.
Bruce Petrarca screen capture

You can now tweak and adjust to your hearts content, confident that all your work will be saved on your computer.

What CV do I need to adjust to change the sound volume?

I hear questions like this all the time. My response is usually, “I don’t know.”

Why?

Because I use DecoderPro. I don’t have to remember CVs. I let the computer do it for me.

22. Adjusting sound volume on a Soundtraxx Econami decoder. *Bruce Petrarca screen capture*

I just open the SOUND LEVEL tab and adjust all the different sounds using the sound level sliders and POM [22]. As soon as I hit the WRITE ALL CHANGES button, the sound level changes. A few tweaks and I have it where I want it.

The same is true for lights, speed matching, etc. All are a snap to adjust Programming On the Main with DecoderPro.

Remember that chance of programming the wrong locomotive when using Programming On the Main (POM)? Well, that is virtually impossible with DecoderPro. You tell DecoderPro what locomotive you are interested in talking to by which file you open.

How do I keep all of this straight?

Once I put a bunch of time into a locomotive, I don't want to loose those settings. Before DecoderPro, I was using spreadsheets and notebooks to keep track of how I personalized decoders. Ugh.

When DecoderPro is ready to close a file, it asks if you wish to save the changes. By saying YES, you assure that the latest version of a decoder setup is saved on your computer.

When you want to work on a locomotive again, you have two choices. You can select the locomotive manually from the roster and then select in the lower right which programming method you want to use. You can also select EDITONLY, if you want to make clerical changes to your file without changing the setup.

Or you can allow DecoderPro to find your file by pressing the IDENTIFY button in the upper right of the DecoderPro home page [23], when you have your locomotive on the programming track.

23. DecoderPro will find the roster entry for your locomotive, if you ask it to IDENTIFY your locomotive. ***Bruce Petrarca screen capture***

How do I handle two or more computers?

Backing up your data is beneficial. One of the best ways is to store it on several computers in several locations. The more synchronized sets of data you have the better the odds that you won't loose it. Separate but different sets of data are a nightmare.

Here is what I do. You may choose to do a similar thing or something different. Again, share your experiences in the MRH subscribers' blog by clicking on the Reader Feedback buttons at the beginning or end of this column.

I use Dropbox (dropbox.com).

When I installed DecoderPro, I installed all of my decoder programming data (DecoderPro roster plus all of the sound loading files) in folders contained within a single main folder in the Dropbox folder that I share amongst all my desktop and notebook computers. That way, my files are available on multiple computers and are automatically backed up in several locations. Yes, they are very likely to be in the same house all the time, but, if we have a major fire, I think missing the DecoderPro roster will be the least of my challenges.

Our club (pcmrc.org) has an internet connected computer that is interfaced with the Digitrax system [4]. We installed Dropbox so that board members have access to our club documents from home.

When I program a locomotive from the club, I check the club's folder and mine for the latest version of the DecoderPro data file (in .XML format). I copy that into my folder, if necessary. When I'm done with the club locomotive, I try very hard to copy the new file into the club's folder, so that it will be available at the club layout the next time I'm there.

There is a help page for Dropbox interaction on the jmri.org/help/en/html/setup/Dropbox.shtml site.

How do I get help with DecoderPro?

That brings us to the question of how to get more JMRI help, including DecoderPro issues.

I've mentioned that there are many helpful pages on the jmri.org/help/en/webtoc.shtml site. But sometimes a bit of hand holding is needed. The users and developers frequent a Yahoo group and can help iron out many issues. To join the group, send an eMail to jmriusers-subscribe@yahoogroups.com. Once you have joined, you can send questions to jmriusers@yahoogroups.com.

Also, many of the users and developers attend conventions and give hands-on clinics in various aspects of the package. A query on jmriusers@yahoogroups.com will probably get a schedule of future plans for clinics.

Who builds and benefits from JMRI?

One comment before I answer that question. These screen captures were made with DecoderPro version 4.4. Other versions may or may not have the same attributes or look the same.

The JMRI organization is all volunteers. There is no paid staff; no customer service department. The folks who answer questions on the Yahoo group are just volunteers, too. Most of them have invested their own money in hardware to be able to do what they do for the organization.

While nobody makes a penny by doing what they do for JMRI, the beneficiaries are model railroaders the world over. The money from contributions helps defray past, present and future expenses. Remember, I recommend a $10 per year per user donation. You will keep up your part, won't you?

It's your choice

You can keep doing things the hard way: learning CVs, manually tracking changes and backing up files. Or, you can sit back and let your computer do something more than just surf the web and read email.

Please share your ideas with us all. I'd love to hear what you think. Just click on the Reader Feedback icon at the beginning or the end of the column. While you are there, I encourage you to rate the column. "Awesome" is always appreciated. Thanks.

Until next month, I wish you green boards in all your endeavors.

Mr. DCC's Workbench

How to save money on under-layout bus connections.

Several years ago, a friend, Chuck (AKA "Rick") Ricketts, moved from the Phoenix area to the Seattle area. Even with failing eyesight, he has pressed on and become a Master Model Railroader.

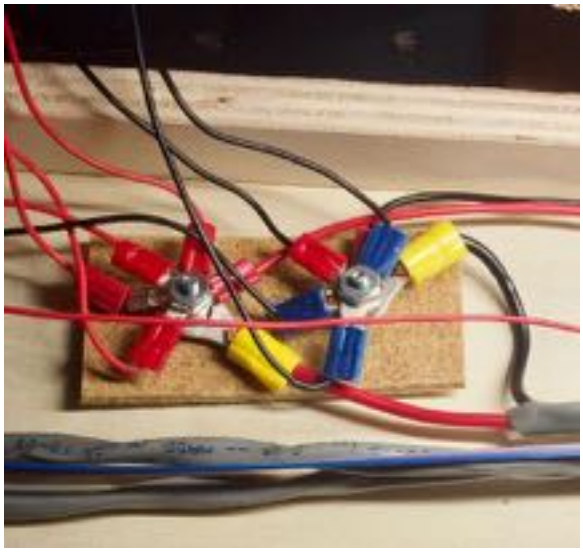
24. Chuck Rickett's On30 layout. *Bruce Petrarca photo*

In conjunction with the NMRA national convention in Portland, I got a chance to visit Chuck and see his amazing On30 layout [24]. It is truly fitting for a MMR.

I'd like to share a trick I learned from him. He has made his DCC bus connections quickly, easily and at low cost.

He drilled [25] and countersunk holes in a piece of Masonite. He then used flat-head #6-32 screws for the terminal posts. Nuts and washers complete the connection. He uses ring terminals and different sized wire for his bus and his district wiring. The piece of Masonite is held to the layout with either nut-bolt-washer combinations or #6 sheet metal screws (½ inch or so long).

25. Simple bus connections under Chuck Rickett's layout. *Bruce Petrarca photo*



Notice the red and black color coding.

While this may not be the answer for every layout, it is a tool to keep in your arsenal, in case you need it.

