You have your Digital Command Control (DCC) layout up and running and want to host an operations session. Or maybe you just want a way to control everything on your layout from one location without stringing miles of wires and installing a large number of switches and relays. A software program called Java Model Railroad Interface (JMRI) maybe just the ticket to do this. JMRI, as their website explains, is an “open-source project for developers to write software for model railroads…..with more than three hundred people writing parts, and users on every continent except Antarctica”. The software runs on Windows, Mac OS, and Linux computers. The program can be downloaded free of charge from the JMRI website at: http://jmri.sourceforge.net/.

JMRI is a suite which includes programs to easily program your DCC locomotive and maintain those settings in a locomotive roster using DecoderPro®; build control panels, including signaling, and operations as well as control your layout using PanelPro®. It also has the ability to automate layout devices and even room lighting using JMRI Logix. One of the latest added components is JMRI Operations which lets you create manifests to route cars over your railroad from shipper to receiver, and provide train crews with operating instructions.

This article will focus on the basic elements of PanelPro® and how I used it to build my dispatcher panel for my railroad, The Nickel City Line. Before you even get started, you must have a computer and a means to connect the computer to your DCC Command Station. JMRI will work with over 30 DCC systems. Under ‘Hardware Support’ on the JMRI webpage you can find the recommended computer connection that will work for your system and computer. I actually use two computers; a laptop and a PC to run panels at the Dispatcher Office and the Yardmaster Office. Both are older computers running Windows XP. They don’t need to have a lot of computer speed, but they should be dedicated to the layout so they are not running other programs in the background. Both of mine are surplus computers that friends were getting rid of when they upgraded. I simply wiped the hard disks and reinstalled the operating system, drivers and JMRI. Now they are dedicated to the railroad. Since my layout is powered by Digitrax, I use the Locobuffer USB from RR-CirKits http://www.rr-cirkits.com/. The device connects to a USB slot on the computer. A Loconet cable runs from the Locobuffer to the command station. After setting up the Locobuffer on the computer and in the JMRI software you are ready to start using JMRI. For the computer to communicate with devices on your layout such as turnouts; and for it to see where trains are on the railroad; the layout must be equipped with stationary decoders that can do these functions. On my railroad I use Digitrax® BDL-162s (now replaced by the BDL-168) for block detection of trains and I use Digirax® SE-8c’s for turnout.
control and signaling. My layout is gapped for 32 blocks, 40 turnouts, and control of 160 signal heads. Once the hardware is up and running it is time to play with PanelPro® and build the dispatcher panel. Even before you start using PanelPro® you should draw out your layout on paper. See Fig. 1. A simple linear drawing will do well. Identify all the turnout numbers and block detection sections. This will aid greatly as you start to draw the panel on the computer. Fig.1 below is a drawing for the panel I will use for this article. The Anytown Shortline is a simple East to West route with two passing tracks and staging yards on each end of the railroad. I have elected to use turnout numbers 1 to 10 and block detection sensors 20 through 41. On your own railroad these numbers will vary depending on how you set up your system, but here we will keep it simple. Open PanelPro®, select ‘New Panel’ from the drop down menu and open the Control Panel Editor. See Fig. 2. Name the panel first and save it so you can find it later if you have to stop before all the elements are drawn. I named my panel Test Panel which now displays the name on the top ribbon of the window. The default background color is light gray. I changed it to black because it makes things much easier to read when using track occupancy indicator icons. The next step is to populate the tables for turnouts and sensors. I started with turnouts first. Click on the ‘Add Items’ selection at the top of the panel and select ‘Item Table List’. On the right hand side is a list of tables used by JMRI. Select ‘Turnouts’. The table will be blank. Select the ‘Add’ button at the bottom of the table. A new window will open to add a turnout. I added 10 turnouts quickly by checking the ‘Add a Range’ box and entering ‘10’ in the ‘Number to Add’ box. Loconet should already be selected for the System window if you are running Digitrax®, otherwise it will display the DCC system you selected for your own DCC system when you installed the program. I entered ‘1’ in Hardware Address window because that is the lowest numbered turnout I am using in this example. Hit the ‘OK’ button and now you will see 10 turnouts in the table labeled LT1 through LT10. See Fig. 3. The LT stands for Loconet Turnout. If you using a different DCC system you will see a different letter in front of the T.
Now I will add 21 block detection sensors. Click on ‘Sensors’ in the right hand column and the Sensors table opens and it is populated with one item labeled ‘ISCLOCKRUNNING’. This is an internal sensor to run the Fastclock feature in JMRI which I will not touch on here. Again, click the ‘Add’ button at the bottom of the table. Check the ‘Add a Range’ box and enter ‘21’ in the ‘Number to Add’ box. See Fig. 4. Again, Loconet should already be selected for the System window if you are running Digitrax. I entered ‘20’ in Hardware Address window because that is the lowest numbered sensor I am using in this example.

Hit the ‘OK’ button and now you will see 21 sensors in the table labeled LS20 through LS41.

See Fig. 5. With the Turnout and Sensor tables populated I can go to work drawing my panel. I will start my panel by adding the first turnout, LT1. From the menu at the top of the panel I select ‘Add Items’ and then select ‘Item Palette’. With the Item Palette window open, I selected the ‘Indicator Turnout’ tab. In the Indicator Turnout window I’ll click on the ‘USS-Right Turnout’ button. In the box on the screen will appear a turnout in all white. This will be the graphic I use for LT1. Click on LT1 from the table list in the window which will highlight the row in blue. See Fig. 6. Since the turnout is also wired into a detection sensor, refer to the drawing in Fig. 1 and see the associated sensor is LS24. Enter LS24 into the ‘Occupancy Circuit’ window. Now simply click on the graphic in the box and drag it onto the panel. The turnout is not oriented correctly so right-click on it with the mouse and...
then select ‘Rotate’ and rotate the turnout 180 degrees. Now drag the turnout to where you want to place it on the panel. Repeat this process for turnouts LT2 and LT3. Since both of these turnouts are on the same detection circuit you only have to highlight the associated turnout in the table and then drag the icon(s) onto the panel. Now position the turnouts so they are just touching each other as shown in Fig. 1.

The next step is to add the track. Click on the ‘Indicator Track’ tab which opens a new window. Now add track that is wired to occupancy sensor LS20. Refer to Fig. 1 to see where that track is. Now enter ‘LS20’ in the ‘Occupancy Circuit’ window and click on the ‘USS-BlockSegment’ button and a white line shows up as the graphic.

Drag the line onto the panel and connect it to the upper track connection of LT1. See Fig. 7. The line needs to be longer so click on the line and select “Duplicate’. A copy of the line appears over the first which can be dragged over and connect to the first line to make it longer. Repeat this process until you have the track protected by LS20 as long as needed. Repeat the process to add and duplicate tracks for LS21 through LS25, each time making sure the line you are adding corresponds to the right detection sensor in Fig. 1. When finished the panel will look like the one in Fig. 8. Now add LT4, remembering that this is a left-hand turnout so you will need to click on the ‘USS-LeftTurnout’ and this turnout is protected by occupancy detector LS26. Add tracks for LS27 and LS28. Once added you will need to lengthen these track sections. Speed up the process by left clicking on LS27, holding the Ctrl button and then clicking on LS28. Both tracks are highlighted by yellow rectangles. Now right click on either section and the pop up menu
appears where you will select ‘Duplicate’. Now drag the duplicates of the two tracks and join them to the first sections. Do this several more times. Then repeat the process grouping multiple sections of parallel tracks using the Ctrl key and then duplicating the group. This greatly speeds up the process. See Fig. 9.

Repeat all of the above for turnouts LT5 through LT10 and detection sensors LS29 through LS41 to complete the panel. Because the layout is longer than the screen, draw it on two rows, using track protected by sensor LS30 as the connection between the rows. When finished the panel will look like Fig. 10. Add some text for the turnouts, tracks, towns and the railroad name by selecting the ‘Text’ tab in the Item Palette. Type the text you want in the text window and hit ‘Enter’. The text will appear in the display window at the bottom. Now you can change the font size, color and style of the text. Simply drag it from the Item Palette onto the panel and place it wherever you want it. When finished the panel looks like Fig. 11. Add two small industries, Mr. Hooper’s Store and Dirty Old Coal Mine, which are accessed by track...
to use. Use a non-indicating turnout and track segment. Open the track files and simply drag the icon you want onto the panel and place it where it is needed. Now the panel is complete and ready for a test run. See Fig. 12. I added two trains, numbers 17W and 18E, by going to the ‘Marker’ menu and clicking ‘Select Loco’. See Fig. 13. I changed the marker color from white to red and placed the markers on each end of the layout. Place actual locomotives on the layout in the associated sections which activate the blocks and change the icons on the panel from white to yellow (on my Nickel City panel I modified the icons to display red when occupied since it is easier to see than the default color yellow.) Click on the turnouts to set the route for each train then start the trains on their runs. As they progress across

controlled by ground throws. Since these have no motorized turnouts or detection sensors use graphics from the ‘Icon’ tab in the Item Palette. To be consistent you need to change the default icon so click on the ‘Icon Catalog’ button and select the directory that has the icons you want to use. In my case the icons were located in C:\Program Files\JMRI\resources\icons\USS. JMRI points you in the right direction so all you need to do is browse the directories to find what you want

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Fig. 14  Train 18E is on Track 4 in Westville and has activated sensor LS20 which turns yellow Train 17W is on Track 3 in Easton and has activated sensor LS40.

Fig. 15  As Train 18E departs Westville it passes into sensor LS24 which protects turnouts LT1 through LT3. Track 4 (LS20) and turnouts LT1 through LT 3 are yellow indicating a train is in those blocks.

Fig. 16  As both trains progress across the railroad they trip occupancy detectors in each area they are present. As they leave an occupancy block it returns to the color white stating the block is clear. Note that Train 17W is in sensor block LS30 which is yellow on both the upper and lower rows in the panel diagram.
the railroad the occupancy sensors in one or more blocks will activate to tell the dispatcher where the train is. As a train clears each block the color of the block changes back to white, indicating no presence of a train. See Fig. 14 through Fig. 17. In order for the panel to work properly each piece of rolling stock should have one resistor wheel set installed on the car. Passenger cars with interior lighting do not need resistor wheel sets. There is much, much more that JMRI can do beyond what I discuss in this article. For example, my Dispatcher Panel on the Nickel City Line includes a fastclock, signals controlled by JMRI Logix, and sound effects. I also have a Yardmaster’s Panel that does the same in the main yard. Each panel also has built in track routing that is activated by the click of a button on each panel. The use of JMRI’s PanelPro® adds a lot of opportunity to a railroad and takes advantage of all the exciting features offered by DCC systems. The more you play with JMRI, the more things you can dream up to do with it.

Bob Rodriguez has been a model railroader for over 40 years and has built several small and medium size layouts including assisting with construction of the Prince William County Model Railroad Club’s layout in Quantico, Virginia. He is the President and Chief Operating Officer of the Nickel City Line Railroad Company [What that means is that since he built it, he can give himself any title he wants] and a founding member of the Prince William County Model Railroad Club where he served as the club’s Secretary, Treasurer, Newsletter Editor, and Show Coordinator. He has earned four Achievement Certificates in Electrical, Scenery, Association Volunteer, and Chief Dispatcher. He is working on three more certificates towards his Master Model Railroader Certificate. Bob began operations sessions on his Nickel City Line railroad in November 2002 and has hosted over 70 sessions to date, introducing 73 model railroaders to operations on his railroad. He also operates with a round-robin group of model railroaders from Maryland and Virginia. You can view Bob’s layout at: http://home.comcast.net/~ncrrr/.

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