

# User's Guide Version 2.12

JMRI Organization

Released September 15, 2011

**JMRI®**



## PREFACE

**JMRI is a Java-based cross-platform application for model railroaders. JMRI contains applications for:**

**The programming of Digital Command Control (DCC) decoders, (DecoderPro®).**  
**Drawing computer based panels for depicting a model railroad layout , (PanelPro® ).**  
**Controlling the layout, (Layout Editor).**  
**Creating train manifests for duplicating railroad operations, Operations**  
**Controlling the signals on the layout**  
**Controlling lighting and sound in the room, and so forth. (SoundPro®)**

All this capability is contained in one program (JMRI) which has several “start-up” screens for the various applications.

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JMRI® can run on any computer system that will run Java 1.5.0 or later, whether it is Macintosh, Windows, or Linux based. It does require that Java be installed on the computer. You can get Java as a free (but very large...) download at:

<http://java.sun.com/getjava/>

If this is your first visit to our manual we suggest that you take the Decoder Pro® tour at  
<http://jmri.sourceforge.net/help/en/html/apps/DecoderPro/Tour.shtml>  
to get an overview of what we're about to cover..

Note: All screen shots in this manual are from a Windows machine using the "Metal" User Interface option. While your screens will probably differ in some layout details, they will be essentially the same. All programming examples shown are with Digitrax PR3(MS100 mode) connected to Digitrax Super Chief Radio Command Station. Most of the decoders in locomotive samples will be Digitrax, except for sound examples.

Note: This entire manual has been updated to correspond to DecoderPro 2.12, and the HTML verified using HTML4 and Cascading Style Sheets. If the formatting looks odd, you probably need to update your browser.

## REVISIONS

<b>DECODERPRO® REVISION RECORD</b>			
<b>Version</b>	<b>Revision Date</b>	<b>Author</b>	<b>Revision Notes</b>
<b>1.1.9</b>	9/4/2002	Joe Ellis	CEO, Bethlehem-Ares Railroad, a 1:160 Corporation
<b>1.3</b>	No date	Bob Blackwell	
<b>2.4</b>	2/15/2009	Dale A. Tripp and Bruce Shanks	Updated to JMRI version 2.4, new sections added
<b>2.8</b>	1/15/2010	Dale A. Tripp and Bruce Shanks	Updated to JMRI 2.8. Expanded Table of Contents with additions of sub titles, Updated Comprehensive Programmer, added Advanced Programmer features, including Roster Media pane, added Roster Group feature, Updated decoder definition submission process and added Operations section.
<b>2.12</b>	9/15/2011	Dale A. Tripp Bruce Shanks Walter Thompson	Updated to JMRI 2.12 Installation information added Contents updated to current functions

## TABLE OF CONTENTS

### REVISIONS

### TABLE OF CONTENTS

## CHAPTER 1 - INSTALLING JMRI®

Preparing to Install JMRI®	1
Installing JMRI software	1

## CHAPTER 2 - GETTING STARTED WITH DECODERPRO®

What is DCC?	3
What DCC systems will Decoder Pro work with?	3
What hardware do I need?	4
How do I start the DecoderPro® program?	4
How do I set up my preferences?	5
Connections Pane (TABS are configured to the system your selected)	7
Defaults Pane	8
File locations Pane	9
Start Up Pane	10
Display Panes	12
GUI Pane	12
Locale Pane	13
Console Pane	13
Messages Panes	14
Roster Panes	14
Programmer TAB	14
Roster TAB	14
Throttle Pane	15
WiThrottle Pane	15
MiniServer Pane	17
You must restart DecoderPro for preferences to take effect	17

## CHAPTER 3 – USING DECODERPRO®

How do I set up to program a decoder?	19
---------------------------------------	----

# JMRI® User's Guide Version 2.12

---

Service Mode (Programming Track) Programmer	19
Operations Mode (Main Track) Programmer	19
<b>Additional programmers that are available.</b>	<b>20</b>
Single CV Programmer Lets you program older decoders one CV at a time.	20
Multi-Programmer Control	20
What are the Programming Modes?	20
<b>Service Mode (programming track) Programmer</b>	<b>21</b>
<b>Operations Mode (Main Track) Programmer - or Programming on the main(POM).</b>	<b>21</b>
Identifying the installed decoder	22

## CHAPTER 4 - DECODERPRO® PROGRAMMING MODES

<b>Simple Programmer</b>	<b>25</b>
Service Mode Programmer	25
Reading your Decoder On the programming track:	26
Ops Mode Programming	26
Reading from your Decoder on the main:	27
Multi-Decoder Control	27

## CHAPTER 5 – THE BASIC PROGRAMMER

<b>The Roster Entry Pane</b>	<b>31</b>
Basic Pane	35

## CHAPTER 6 - DECODERPRO® COMPREHENSIVE PROGRAMMER

<b>Roster Entry Pane</b>	<b>39</b>
<b>Expanded Basic Pane</b>	<b>40</b>
The Read and Write Buttons	41
<b>Motor Control Pane</b>	<b>42</b>
<b>Speed Control Pane</b>	<b>43</b>
<b>Speed Table Pane</b>	<b>45</b>
Function Mapping Pane	51
<b>Lighting and FX Functions Pane</b>	<b>52</b>
<b>Analog Controls Pane</b>	<b>54</b>
<b>Consisting Functions Pane</b>	<b>55</b>
<b>Advanced Features Pane</b>	<b>57</b>

# JMRI® User's Guide Version 2.12

---

<b>Sound FX Pane</b>	<b>59</b>
<b>Sound Levels Pane</b>	<b>60</b>
<b>Global CV Listing Pane</b>	<b>61</b>
Decoder Locking	61
<b>Manufacturer Specific Data Pane</b>	<b>63</b>
<b>Printing Decoder Data</b>	<b>64</b>

## CHAPTER 7 - ADVANCED PROGRAMMER

<b>Roster Entry</b>	<b>69</b>
Function Labels Pane	70
<b>Roster Media Pane</b>	<b>72</b>
<b>Expanded Basic Pane</b>	<b>74</b>
<b>Motor Control Pane</b>	<b>74</b>
<b>Speed Control Pane</b>	<b>74</b>
<b>The Speed Table Pane</b>	<b>75</b>
<b>Function Mapping Pane</b>	<b>75</b>
<b>Lighting and FX Functions Pane</b>	<b>75</b>
<b>Analog Controls Pane</b>	<b>75</b>
<b>Consisting Functions Pane</b>	<b>75</b>
<b>Advanced Features Pane</b>	<b>75</b>
<b>Sound FX Pane</b>	<b>75</b>
<b>Sound Levels Pane</b>	<b>75</b>
<b>Global CV Listing Pane</b>	<b>75</b>
<b>Manufacturer Specific Data Pane</b>	<b>75</b>
<b>Printing Decoder Data</b>	<b>75</b>

## CHAPTER 8 - DECODERPRO® MAIN WINDOW

---

# JMRI® User's Guide Version 2.12

---

<b>Main Window Overview</b>	<b>77</b>
Menu Bar	77
Additional and Optional buttons	78
 <b>Menu Overview</b>	 <b>80</b>
File	80
Edit	80
Tools	81
Roster	81
Panels	82
SYSTEM (This menu name will depend upon the system that you selected in Preferences. The options are listed. If (none) is selected in Preferences this menu will not be displayed.)	82
Debug	82
Window	83
Help	83
 <b>Main Menu Detail</b>	 <b>83</b>
File Menu	83
Print Decoder Definitions...	83
Print Preview Decoder Definitions...	84
Quit	85
Edit Menu	85
Cut	85
Copy	85
Paste	85
Preferences...	86
Tools Menu	86
Programmers ►	86
Tables ► (advanced users, beyond the scope of this manual)	86
Throttles ►	87
• Edit	88
• View --	89
Toolbar	90
Address Panel	92
Control Panel	94
Slider from 0% to 100%	94
Speed steps	94
Slider 100% to 100% through 0%	94
Function Panel	95
Throttle Function Panel	95
Consisting Tool...	98
Clocks ►	98
<b>Power Control...</b>	99
Turnout Control...	99
Simple Signal Logic (advanced users, beyond the scope of this manual)	99
Sensor Groups.... (advanced users, beyond the scope of this manual)	99

---

# JMRI® User's Guide Version 2.12

---

Speedometer...	99
Light Control...	100
Dispatcher... (advanced users, beyond the scope of this manual)	101
Send DCC Packet... (not covered in this manual)	101
USS CTC Tool ► (advanced users, beyond the scope of this manual)	101
Operations►	101
Roster Menu	102
Create Entry...	102
<b>Edit Entry...</b>	102
Copy Entry...	102
Import Entry...	103
Export Entry...	103
Delete Entry...	103
Print Summary...	103
Print and Print Preview	104
Print Preview Summary...	104
Roster Groups►	105
Create Roster Group	105
Set Active Roster Group	105
<b>Delete Roster Group</b>	105
<b>Table Association</b>	106
Association of roster entries to a Roster Group	106
<b>Associate Roster Entry to Group</b>	107
Restoring Roster	108
<b>Disassociation of Roster Entry to Group</b>	108
Export Complete Roster...	108
Panels Menu	108
New Panels...►	108
Panel Editor	108
Control Panel Editor	109
Layout Editor	109
<b>Load Panels...</b>	110
<b>Store Panels...</b>	110
<u>Show History</u>	110
Show Panels	110
Run Script...	111
<b>Thread Monitor</b>	111
<b>Script Output</b>	111
<b>Script Entry</b>	111
 Operations Menu	 111
<b>Settings</b>	111
<b>Locations</b>	112
<b>Cars</b>	112
<b>Locomotives</b>	112
<b>Routes</b>	112

---

# JMRI® User's Guide Version 2.12

---

<b>Trains</b>	112
System (This menu name will depend upon the system that you selected in Preferences. The options are listed. If (none) is selected in Preferences this menu will not be displayed.)	112
Acela Menu	112
<b>Command Monitor</b>	112
<b>Send Command</b>	113
<b>Configure Nodes</b>	113
CMRI Menu	114
<b>CMRI Monitor</b>	114
<b>Send Command</b>	114
<b>Run Diagnostics</b>	114
<b>Configure C/MRI Nodes</b>	114
EasyDCC Menu	115
<b>Command Monitor</b>	115
<b>Send Command</b>	115
GrapeVine Menu	115
<b>Communications Monitor</b>	115
<b>Send Command</b>	116
<b>Configure Nodes</b>	116
<b>Node Table</b>	116
LocoNet Menu	117
<b>Monitor LocoNet</b>	117
<b>Monitor Slots</b>	117
<b>Monitor Clock A Digitrax</b>	118
<b>Monitor LocoNet Stats</b>	119
<b>Configure BDL16/BDL168</b>	119
<b>Configure LocoIO</b>	119
<b>Configure PM4/PM42</b>	120
<b>Configure SE8C</b>	120
<b>Configure DS64</b>	121
<b>Configure Command Station</b>	122
<b>Configure LocoNet ID</b>	122
<b>Send Throttle Messages</b>	123
<b>Send LocoNet Packet</b>	123
<b>Select PR3 Mode</b>	124
<b>Download Firmware</b>	124
<b>Download Sounds</b>	125
<b>Edit SPJ Sound File</b>	127
<b>Start LocoNet Server</b>	127
<b>Start LocoNet over TCP Server</b>	127
NCE Menu	127
<b>Command Monitor</b>	128
<b>Send Command</b>	128
<b>Send Macro</b>	128
<b>Edit Macro</b>	128
<b>Edit Consist</b>	130

---

<b>DCC Packet Analyzer</b>	131
Edit NCE Macro Window	132
Edit Consist Window	133
NCE Clock Monitor Window	134
OakTreeSystems Menu	135
<b>Communications Monitor</b>	135
<b>Send Command</b>	135
Powerline Menu	135
<b>Communications Monitor</b>	135
QSI Menu	136
<b>RPS Menu</b>	136
<b>RPS Monitor</b>	136
<b>RPS Receiver Control</b>	136
<b>RPS Polling Control</b>	137
<b>RPS Debugging Window</b>	137
<b>RPS Tracking Display</b>	138
<b>RPS Sound Speed Monitor</b>	139
<b>RPS Alignment Tool</b>	139
SECSI Menu	140
<b>Communications Monitor</b>	140
<b>Send Command</b>	140
SPROG Menu	141
<b>Command Monitor</b>	141
<b>Send Comamnd</b>	141
<b>Console</b>	141
<b>Get SPROG Firmware Version</b>	142
<b>SPROG V3/V4 Firmware Update</b>	142
<b>SPROG II Firmware Update</b>	142
<b>SPROG Console</b>	142
TMCC Menu	142
<b>TMCC Monitor</b>	143
<b>Send Command</b>	143
Wangrow Menu	143
<b>Command Monitor</b>	143
<b>Send Command</b>	143
XpressNet Menu	143
<b>XpressNet Monitor</b>	143
<b>XpressNet System Information</b>	143
<b>Send XpressNet Command</b>	144
<b>Command Station Database Manager</b>	144
<b>LI101 Configuration Manager</b>	145
<b>LZ100 Configuration Manager</b>	145
<b>LZV100 Configuration Manager</b>	146
<b>LV102 Configuration Manager</b>	146
Zimo Menu	147
<b>Command Monitor</b>	147

---

<b>Send Command</b>	147
<b>Debug Menu</b>	147
<b>Memory Usage Monitor</b>	148
<b>Import Decoder File</b>	148
<b>Import Decoder URL</b>	148
<b>Recreate Decoder Index</b>	149
<b>Recreate Roster Index</b>	149
<b>Check XML File</b>	149
<b>Validate XML File</b>	149
<b>Check Decoder Names</b>	149
<b>Check Programmer Names</b>	149
<b>Load Logixs Disabled</b>	149
<b>Log Message</b>	150
<b>Display Message Log</b>	150
<b>Display Log Categories</b>	150
<b>Listed Table Access</b>	150
<b>Listed Table Access - Direct to Routes</b>	151
<b>PRICOM</b> ►	151
○ PRICOM Packet Tester	151
○ PRICOM Flash Update	151
<b>USB Input Control</b>	152
<b>USB Device Viewer</b>	152
<b>Rail Driver Throttle</b>	152
<b>Start Mini Web Server</b>	152
<b>Start Wi Throttle</b>	152
<b>Window Menu</b>	153
<b>Minimize</b>	153
<b>Help Menu</b>	153
<b>Window Help...</b>	153
<b>General Help...</b>	153
<b>License...</b>	153
<b>Locations...</b>	154
<b>Context...</b>	154
<b>System Console...</b>	154
<b>Upload Debugging Info...</b>	155

## CHAPTER 9 – OPERATE TRAINS

<b>What does Operations do?</b>	157
Operations Demo Files	157
<b>Quick Start</b>	159
<b>British Railways</b>	159
Operations Settings Window	159
Menus	159
Tools	159

<b>Print Options</b>	162
<b>Manifest Options</b>	163
Pick Up Locomotive Message Format	164
Set Out Locomotive Message Format	164
Pick Up Car Message Format	164
Set Out Car Message Format	164
Local Mover Message Format	164
Windows	166
Help	166
Operations Locations Window	169
<b>menu bar</b>	170
<b>Tools</b>	170
<b>Window</b>	173
<b>Help</b>	173
Operations Locations Window	173
<b>menu bar</b>	174
<b>Tools</b>	174
Add Spurs, Yards, Interchange, or Staging Only(corresponding to the present task)	180
Each of these buttons opens a corresponding dialog to describe its function.	180
Save --- Track	180
Operations Add Spurs	180
<b>Select the rolling stock serviced by this spur</b>	185
<b>Select the roads serviced by this track</b>	185
<b>Select loads serviced by this track</b>	186
<b>Select trains or routes for car pick ups</b>	187
<b>Optional Schedule</b>	187
<b>Comment</b>	187
Operations Cars Window	190
Menu Bar	191
<b>Tools</b>	191
Operations Locomotive Window	197
<b>Menu Bar</b>	198
<b>Tools</b>	198
The Add Locomotive window	204
Synchronize with NCE Consists	207
Operations Routes Window	208
Menu Bar	209
<b>Tools</b>	209
Window	210
Help -	210
Route List - middle of window	210
Bottom of window	210
Add or Edit Route Window	210
Menu Bar	211
<b>Tools</b>	211
Window	212

---

# JMRI® User's Guide Version 2.12

---

Help	212
Operations Trains Window	215
Menu Bar	215
<b>Tools</b>	216
Preview	216
Scripts	219
<b>Print Options</b>	219
<b>Manifest Options</b>	220
Pick Up Locomotive Message Format	221
Set Out Locomotive Message Format	221
Pick Up Car Message Format	221
Set Out Car Message Format	221
Local Mover Message Format	221
Modify Trains by Car Type-	221
Print Train by Car Types	222
Preview Train by Car Types	223
• Timetable	225
Menu Bar	225
<b>Switch Lists by Location</b>	227
Building Trains	229
Problems Building Trains	231
Building Multiple Trains for a Session	232
Moving Trains	232
A Trip through Operations	232
 <b>Chapter 10 – Decoder Definition</b>	
Getting Started	239
Format	239
Formatting the decoder definition	239
<b>Author</b>	239
<b>Decoder Family and Model</b>	239
Programming modes the decoder will accept	240
Testing	241
Testing the decoder definition	241
Submitting to JMRI	241
Submitting to JMRI	242
 <b>Chapter 11 - DecoderPro® Error Messages</b>	
Decoder Programmer Common Error Messages	245
JMRI Error Codes	245

## INDEX

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## CHAPTER 1 - INSTALLING JMRI®

### PREPARING TO INSTALL JMRI®

The JMRI software package includes:

- DecoderPro®
- PanelPro®
- SoundPro®

There are always two versions of the software available:

- Production Version: The current stable version that is fixed in design and for general use. If just starting, this is the version for you.
- Development Version: The version that is under development for testing and is used to validate new features and changes to existing features. If you are familiar with JMRI and want to help in the validation and testing process, then use this version.

Supported systems(check [www.jmri.org/help/en/html/hardware/index.shtml](http://www.jmri.org/help/en/html/hardware/index.shtml) )

Prior to installing JMRI, you must download the software from [www.jmri.org/download](http://www.jmri.org/download) Select the correct version for your computer system.

- Windows
- Mac OS X
- Linux

### INSTALLING JMRI SOFTWARE

After downloading the JMRI file, now install using the appropriate Installation guide:

- Windows Installation Guide ( [www.jmri.org/install/WindowsNew.shtml](http://www.jmri.org/install/WindowsNew.shtml) )
- Mac OS X Installation Guide ( [www.jmri.org/install/MacOSX.html](http://www.jmri.org/install/MacOSX.html) )
- Linux Installation Guide ( [www.jmri.org/install/Linux.html](http://www.jmri.org/install/Linux.html)
  - Ubuntu GNU/Linux ( [www.jmri.org/install/Ubuntu.shtml](http://www.jmri.org/install/Ubuntu.shtml) )
  - Xubuntu ( [www.jmri.org/install/dectop.shtml](http://www.jmri.org/install/dectop.shtml) )
  - Open SUSE Linux ( [www.jmri.org/install/OpenSUSE.shtml](http://www.jmri.org/install/OpenSUSE.shtml) )



## CHAPTER 2 - GETTING STARTED WITH DECODERPRO®

### WHAT IS DCC?

In short, DCC is Digital Command Control, a system for operating model railroads in a more prototypical manner. Each locomotive contains a tiny, specialized controller. These controllers (decoders) accept digital commands over a network (the rails) addressed to them and interprets them to control the locomotive's speed, direction, lighting effects, sound, and other functions. Each decoder responds only to those commands addressed to it. Not every decoder will have functions beyond basic throttle commands available. Although there are NMRA® standards for the format of communication (allowing the decoders from different manufacturers to work on the same railroad), beyond that there is considerable variety in the functions supported and the implementation of those functions.

Just like any other controller, decoders must be programmed by the user to reach their full potential. While they come with basic "default" programs, most users will want to customize the decoder address, motor control, lights, sound, and other functions to meet their specific needs. You do so by editing **CVs**, or **Configuration Variables**, in the decoder. Some CVs use values ranging from 0 to 255, others use their space in the decoder's memory as a bank of 8 on/off switches. While this lets you do a lot with very little memory, it can get very complex for those of us that are not on speaking terms with binary code.

Decoder Pro attempts to help overcome the inevitable complexity of this system by providing a clear, usable, user friendly open source software solution for programming these on-board decoders. Programming panel designs are written in **XML**, (a close relative of HTML) and can be modified or even created from scratch by users with even a passing familiarity with the format without previous XML experience.

### WHAT DCC SYSTEMS WILL DECODER PRO WORK WITH?

Decoder Pro will work with the following DCC systems:

- Atlas
- C/MRI
- CTI Electronics Acela
- CVP Products Easy DCC
- DCC Specialties
- Digitrax (Loconet)
  - Digitrax PR3 interface
  - RR-CirKits LocoBuffer-USB
  - LocoBuffer-II (LocoBuffer)
  - MS100 interface
- ESU
- Fleischmann
- Hornby
- Lenz
- Lionel TMCC
- Maple Systems
- MERG CBUS

- NAC Services
- NCE
- Oak Tree Systems
- Pro Trak Grapevine
- QSI Solutions
- PI Engineering RailDriver
- Roco
- SPROG II
- SRCP
- Uhlenbrock
- Wangrow
- X10
- Zimo
- ZTC Controls

Depending on the specifics of your system and computer, some type of hardware interface may be required.  
JMRI Hardware Support (<http://jmri.org/help/en/html/hardware/index.shtml>)

## WHAT HARDWARE DO I NEED?

You will need, a means to connect between your computer and the track on which the locomotive rests, that will take serial instructions and generate DCC packets on the rails. At a minimum, a command station/booster( your DCC system will probably suffice), an additional hardware interface to send commands from your computer to the command station (this could be as simple as a serial cable), and a programming track set up according to the manufacturer's instructions.

For some systems, you will also need an additional hardware interface to send the commands from your computer to the command station, and from there on to the decoder in the locomotive. For a Digitrax system, for example, you will need either the **MS100 interface**, **PR3 programmer** or a **LocoBuffer**. The **PR1** device from Digitrax is a stand-alone programmer and is not usable with this software.

For those who do not have any DCC hardware yet and are considering purchasing a DCC locomotive and want to use Decoder Pro to program it consider the SPROG II USB. It has all the electronics in one package with enough output to run a locomotive. It comes complete with the USB cable, power supply, instructions and JMRI on disk. All you need in addition is the test track.

You will also need, of course, some locomotives with the decoders installed which you can program.

## HOW DO I START THE DECODERPRO® PROGRAM?

Once you have downloaded the Decoder Pro software and installed it, simply open the program in the usual manner for your operating system. You should see this or a similar opening screen displayed:



It may take a while for this screen to come up, especially on older and slower computers. Remember that you are essentially running the program on a Java emulator over your native operating system software. New computers can do this fairly quickly, but older ones will feel like they're taking forever. Be patient - it will come up eventually! Even on older computers, once the program is up the response time is quite good.

If this is the first time you have run the program after you installed the software, the **Preferences** screen will come up automatically to allow you to set up the system for your particular configuration. Also if you change your system configuration, OR if you have your laptop away from the railroad, but you want to play with JMRI there is a simulator mode you may want to try. So click next, and we'll have a look at preferences.

## HOW DO I SET UP MY PREFERENCES?

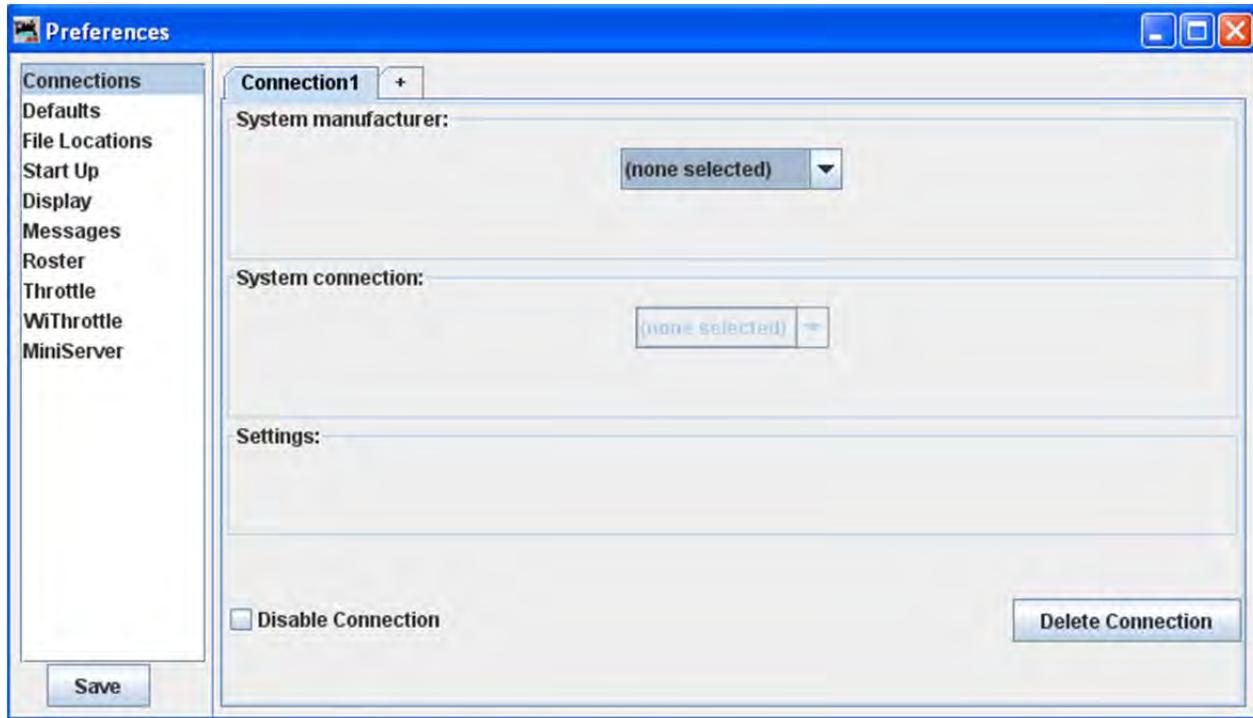
Click on the Edit menu and then Preferences... option in the screen below, which opens the Preferences window. (This window may open automatically the first time you run the program.)

As a first time user the most important information is the **Connections** screen where you describe how the computer will talk to the command station. Most of rest you can leave at the initial or "default" settings until you find a need to change things to suit your fancy.

**Most importantly, you must click to finalize your settings and then re-start the program to have them take effect.**

The Preferences window provides access to the basic configuration information to connect your computer to your DCC system. You will be using that system to actually program and operate trains equipped with DCC decoders.

The window is split into two panes; on the left side is a list of preference groups that may be set. Clicking on one of the items opens the options that may be set in the right side pane. No selection have been made



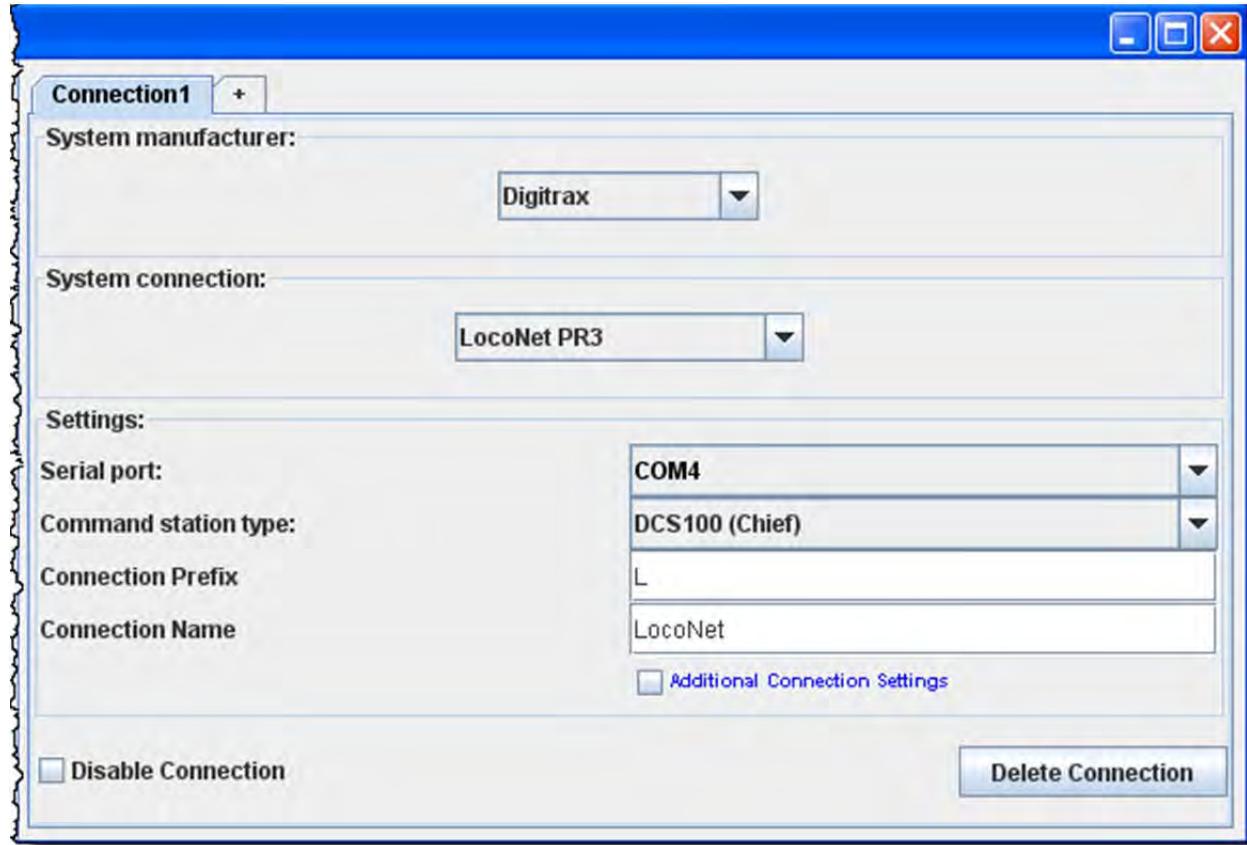
Pane (See below)	Description
<b>Connections</b>	Allows you to select the system connection that you are using for controlling DCC and the connection to your computer.
<b>Defaults</b>	Shows system default settings
<b>File Locations</b>	Set default location for saving User files and Script Files
<b>Start Up</b>	Allows you to set Actions, Buttons, Files and Scripts that run at Start Up
<b>Display</b>	Allows you to select your computer display mode
<b>Messages</b>	Set default actions for system message when displayed
<b>Roster</b>	Allows you to set your default Programmer and roster location
<b>Throttle</b>	Allows you to set up your Throttle preferences
<b>Wi Throttle</b>	Allows you to set up a Wi Throttle settings
<b>MiniServer</b>	Sets up the Decoder Pro® miniServer

Now we will set up preferences for the JMRI environment with your command station.

I am using a Digitrax Super Chief Command Station (radio) interfaced to the computer via loconet, PR3 (MS100 mode) and USB port. I keep master roster on the System Drive.;

## CONNECTIONS PANE (TABS ARE CONFIGURED TO THE SYSTEM YOUR SELECTED)

Now select Connections and connection options display in right pane

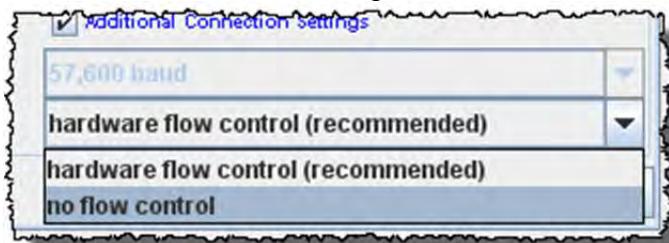


System manufacturer:	Drop-down list with all the supported DCC manufacturers, select the manufacturer of your system.	
System connection:	Drop-down list with all of the supported DCC system interfaces supported by the manufacturer that you selected, select the interface that you are using.	
Settings:	Serial Port:	Drop-down list to select the serial port to which your DCC interface is connected. If you do not know, check your system hardware configuration manual. A second drop-down list may include a selection if there are more than one possibility. Possibility Drop-down list to select the serial port to which your DCC interface is connected. If you do

		not know, check your system hardware configuration manual. A second drop-down list may include a selection if there are more than one possibility
	Command station type:	Drop-down list to select the command station type that JMRI will be using to send your DCC commands.
	Connection prefix	Include the prefix for your connection, in the case shown the "L" is default
	Connection name	Should default to the connection used



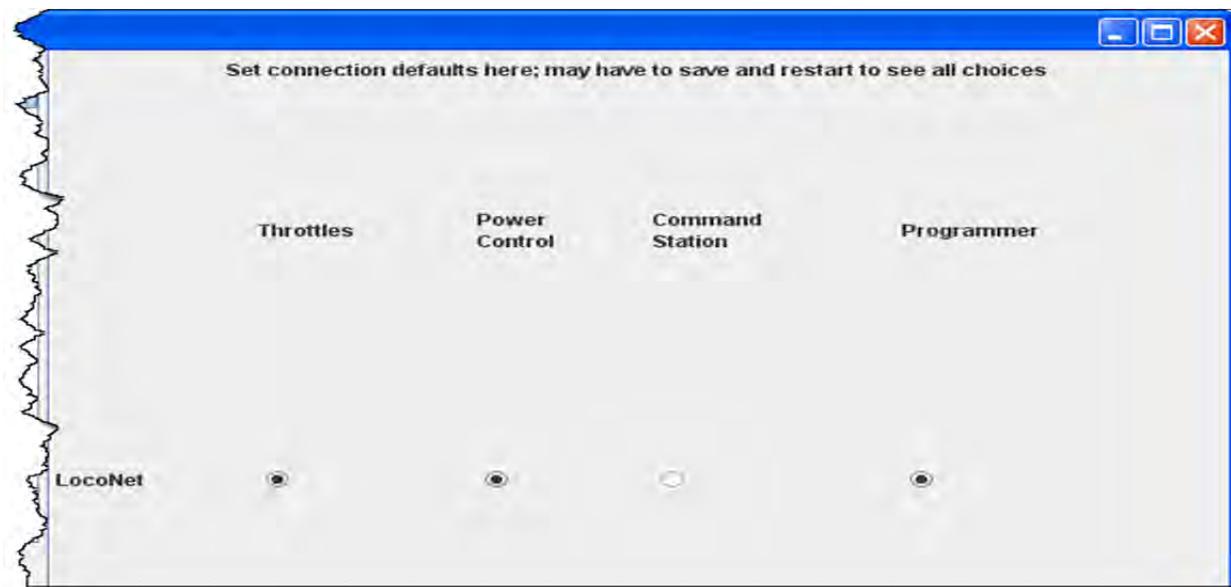
Additional Connection Settings, if checked:



**Disable Connection** button will disable all the connection settings.

**Delete Connection** button Will delete all the connection settings.

## DEFUALTS PANE

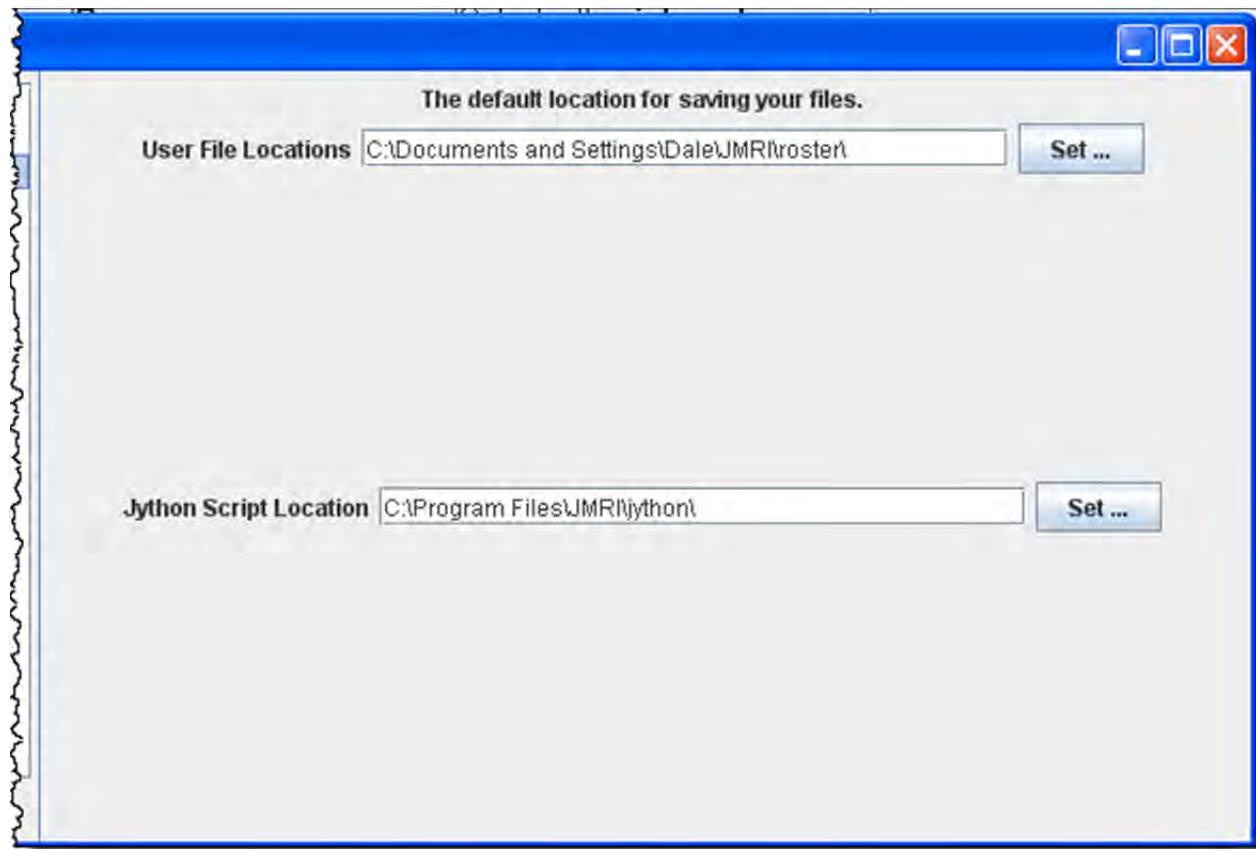


# JMRI® User's Guide Version 2.12

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Shows the default settings which will depend upon the system you are using.

## FILE LOCATIONS PANE

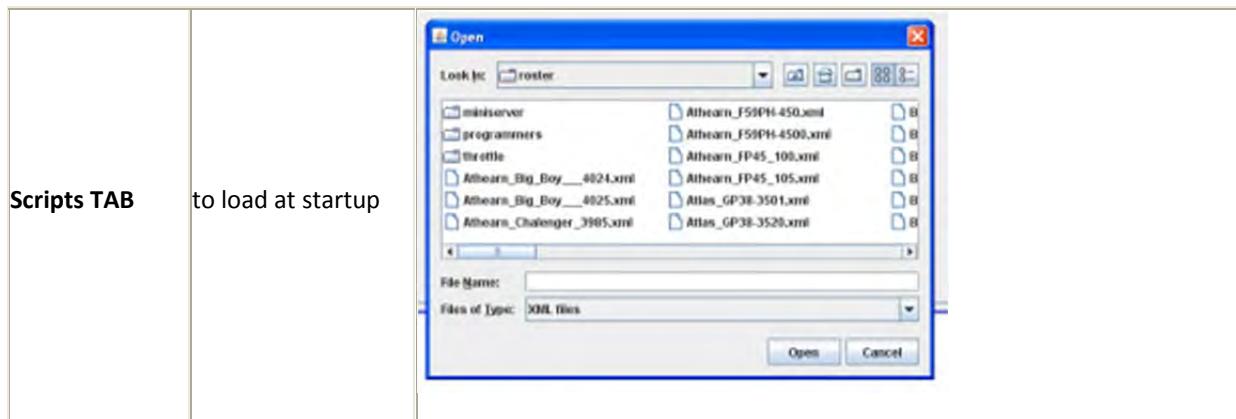


<b>User File Locations</b>	Select the location for your user files on your system
<b>Jython Script Location</b>	Set the location of Jython Script files

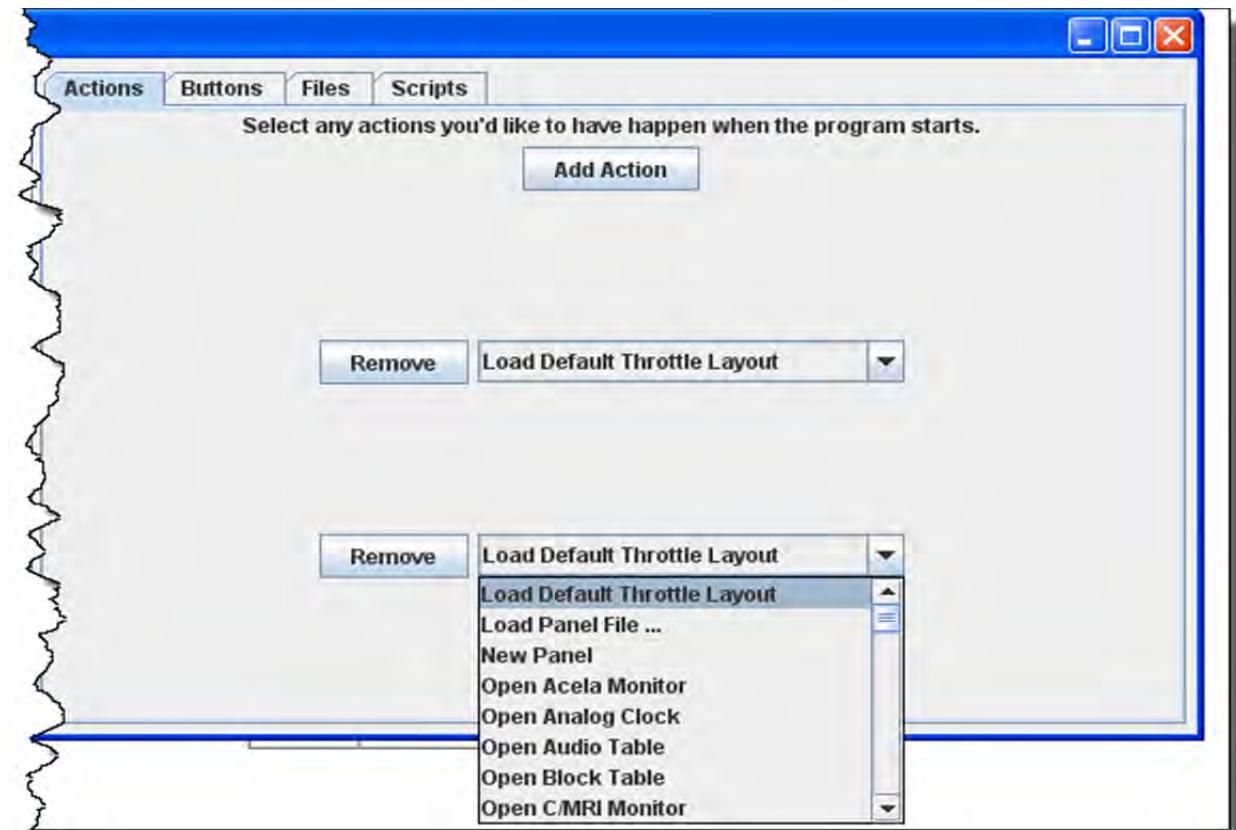
## START UP PANE



Actions TAB	to set up a Startup action	<p>A list of actions in a dropdown menu:</p> <ul style="list-style-type: none"><li>Remove</li><li>Load Default Throttle Layout</li><li>Load Default Throttle Layout</li><li>Load Panel File ...</li><li>New Panel</li><li>Open Acela Monitor</li><li><b>Open Analog Clock</b> (highlighted)</li><li>Open Audio Table</li><li>Open Block Table</li><li>Open C/MRI Monitor</li></ul>
Buttons TAB	to the Splash Screen	<p>A list of actions in a dropdown menu:</p> <ul style="list-style-type: none"><li>Remove</li><li>Load Default Throttle Layout</li><li>Load Default Throttle Layout</li><li>Load Panel File ...</li><li>New Panel</li><li>Open Acela Monitor</li><li>Open Analog Clock</li><li>Open Audio Table</li><li>Open Block Table</li><li>Open C/MRI Monitor</li></ul>
Files TAB	that you want to load at startup	<p>A "Open" file dialog box showing a list of files in a folder named "roster".</p> <ul style="list-style-type: none"><li>miniserver</li><li>programmers</li><li>throttle</li></ul> <p>File Name: _____</p> <p>Files of Type: Python script files</p> <p>Open Cancel</p>



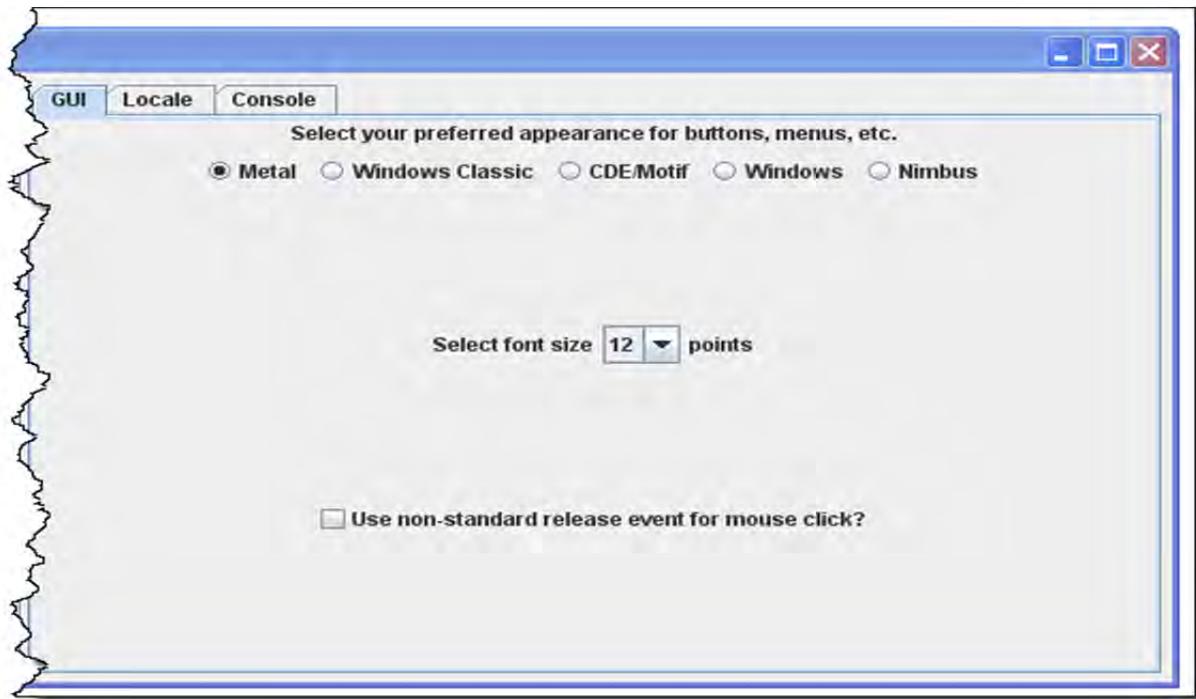
You may add as many items as you want to open on start up. Example of [Actions](#)



removes the item from the Start Up sequence. All of the panes are of the same format.

## DISPLAY PANES

### GUI PANE



Select your preferred appearance for buttons, menus, etc.	
Select font size in points	
<input type="checkbox"/> Use non-standard release event for mouse click?	

The "Select your preferred appearance for buttons, menus, etc." section contains a list of five appearance styles with radio buttons:

- Metal (radio button checked)
- Windows Classic
- CDEMotif
- Windows
- Nimbus

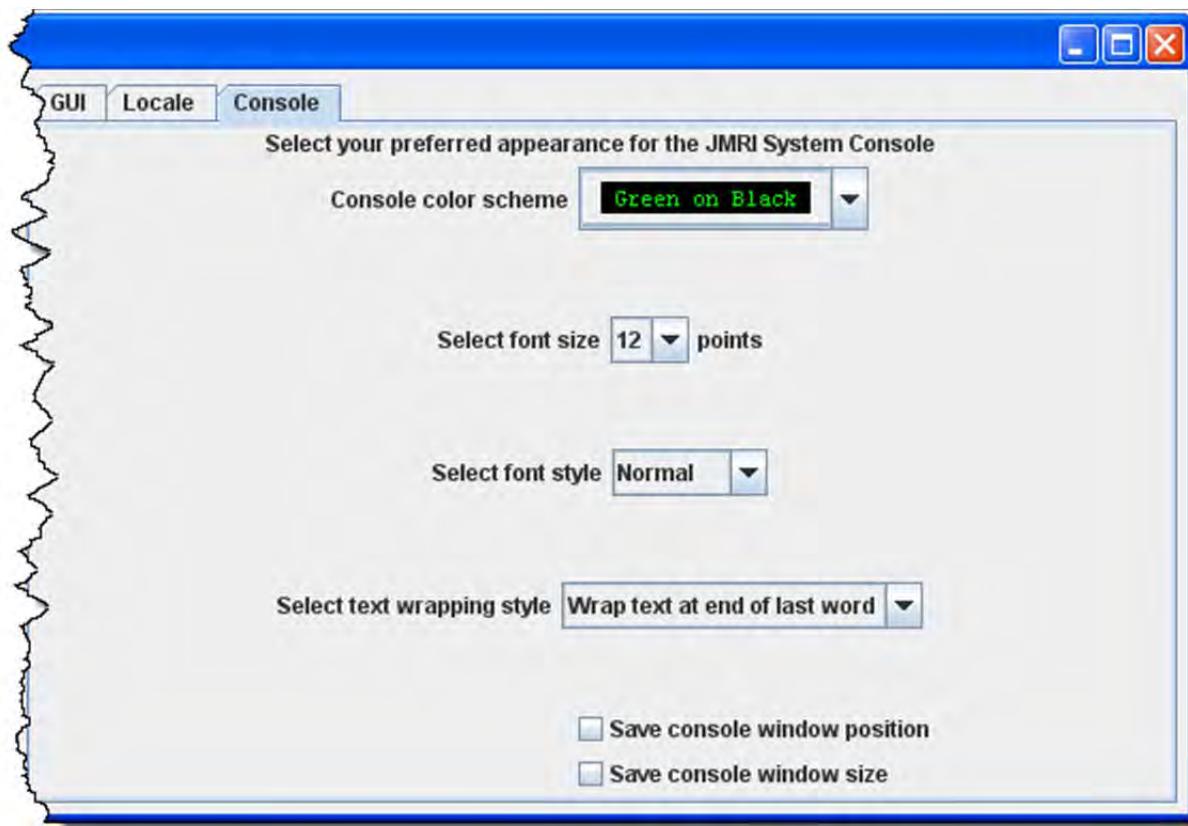
The "Select font size in points" section contains a "select font size" label and a dropdown menu showing "12" and a down arrow.

## LOCALE PANE



Drop-down list to select your location and language

## CONSOLE PANE



Display settings for the JMRI system console.

## MESSAGES PANES

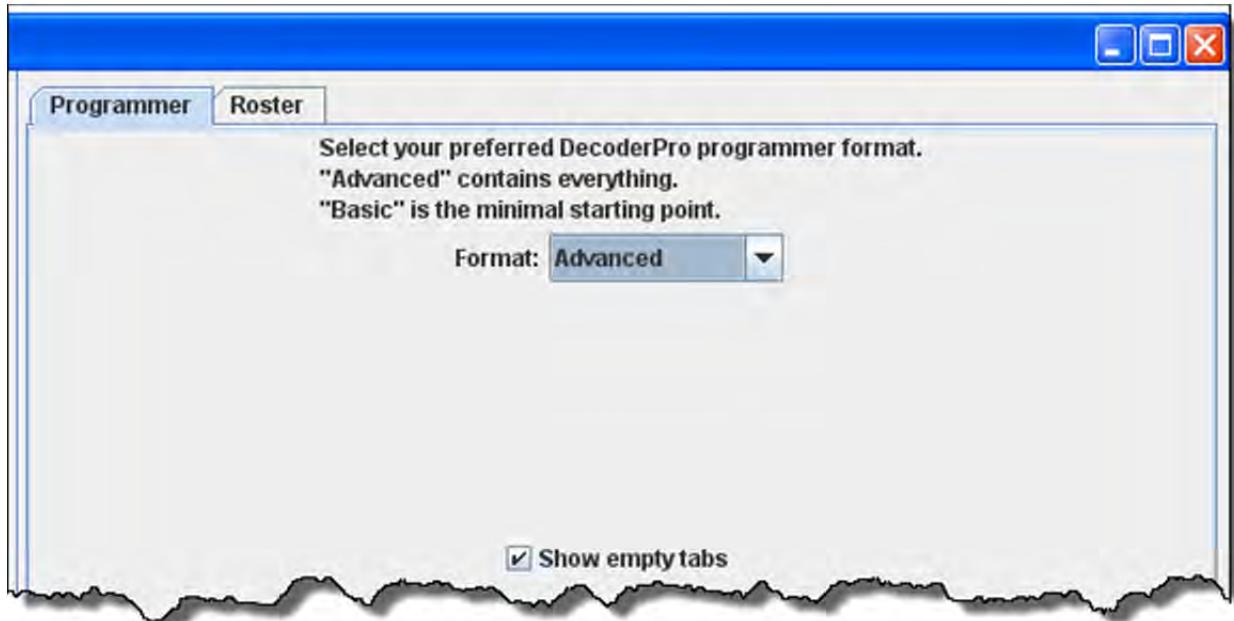
TABS and selections can be used to set how and when messages are displayed.



## ROSTER PANES

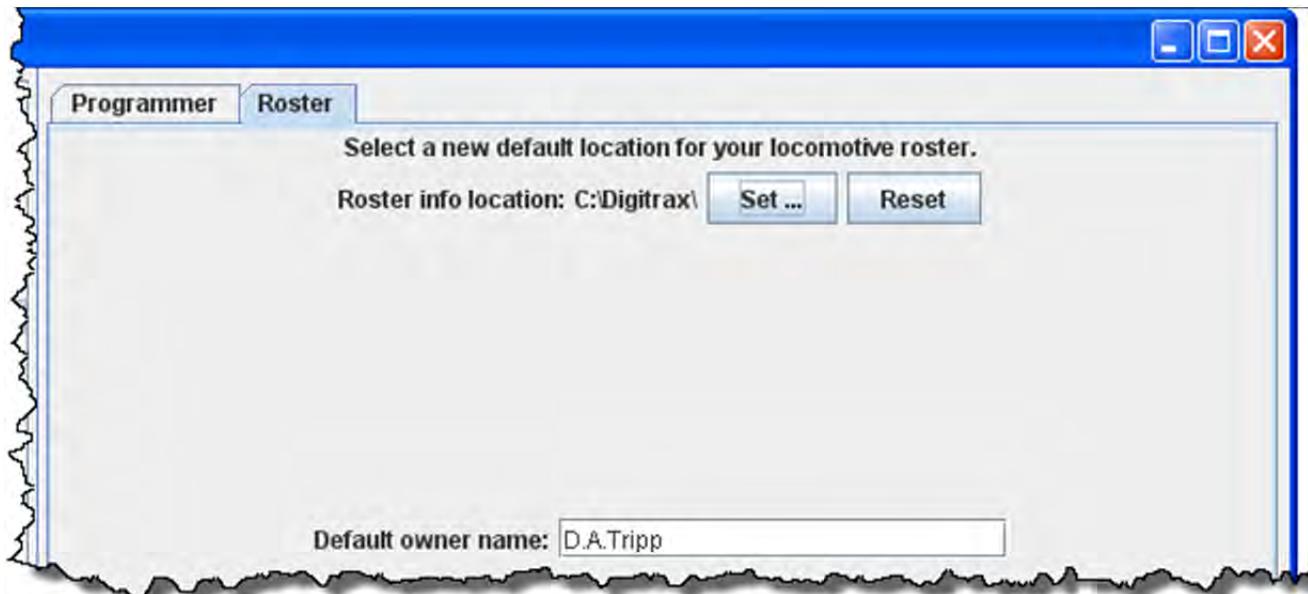
### PROGRAMMER TAB

This pane is used to set the preferred decoder programmer.



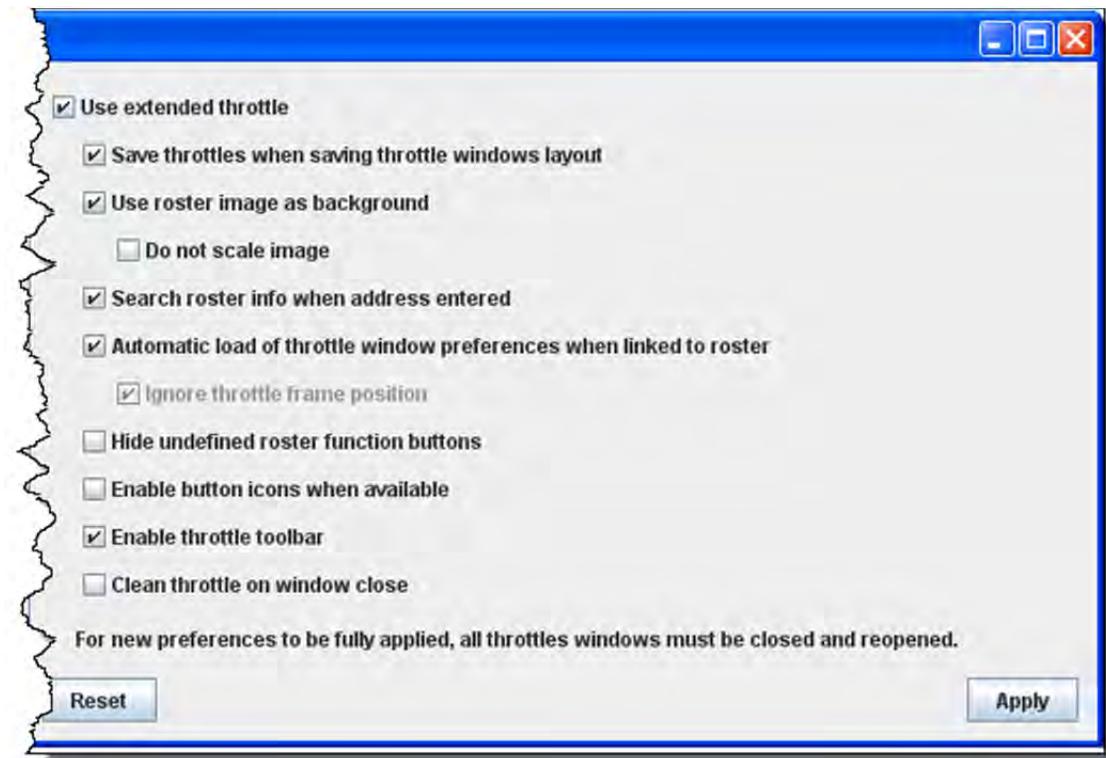
### ROSTER TAB

You may set the default location of the locomotive roster and the default owners name.



## THROTTLE PANE

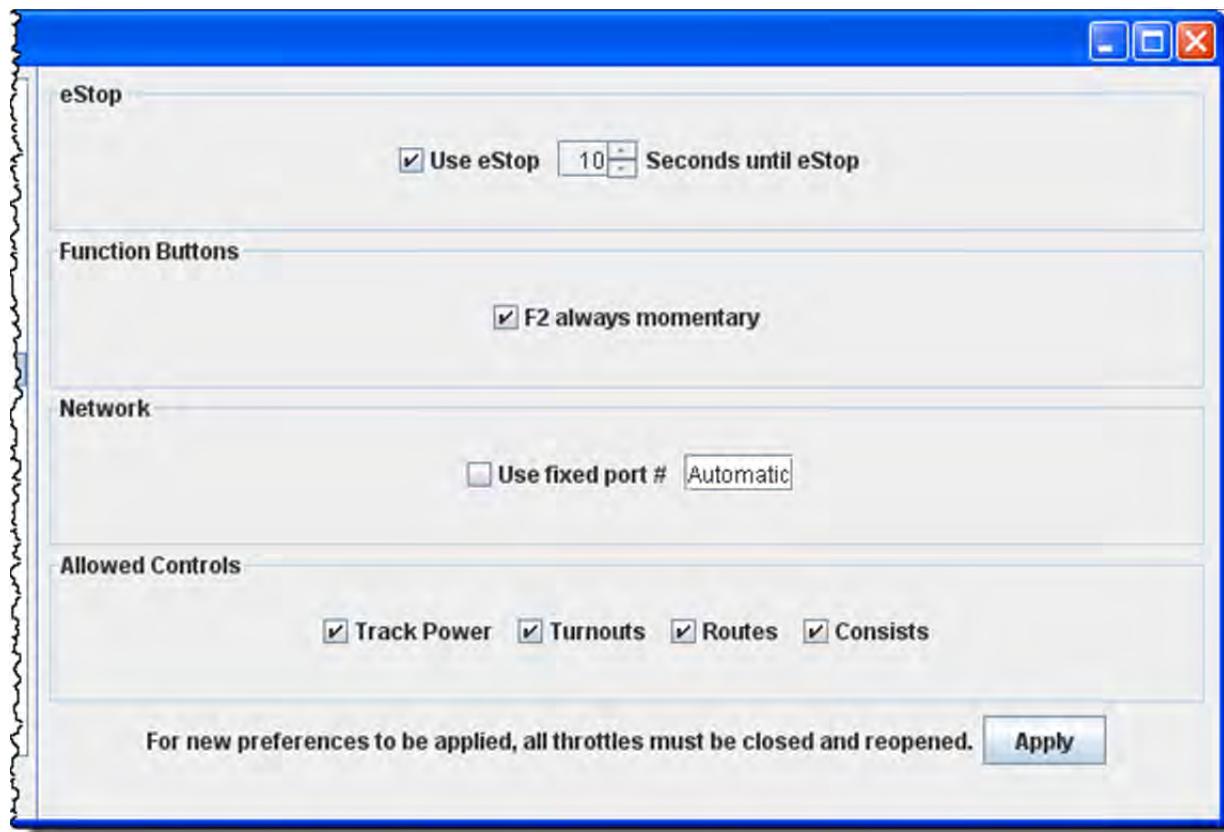
Select throttle startup conditions, shown are defaults, but you may change the settings.



## WITHROTTLE PANE

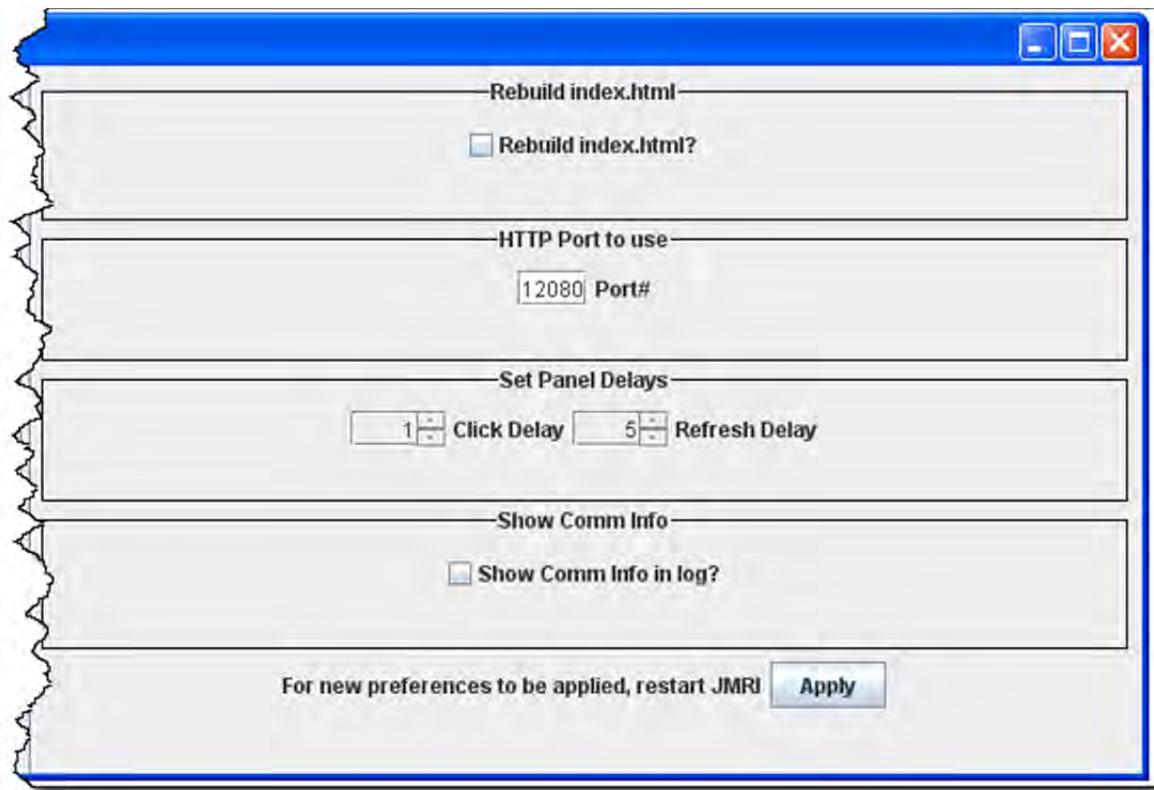
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This pane allows WiThrottle users to customize the setup.



## MINISERVER PANE

Use this pane to setup MiniServer if you are using it.



**Before you exit the preferences, click *on* button to save all your selections.**

**YOU MUST RESTART DECODERPRO FOR PREFERENCES TO TAKE EFFECT**

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## CHAPTER 3 – USING DECODERPRO®

### HOW DO I SET UP TO PROGRAM A DECODER?

Prior to using the programmer you need to have completed the previous section (**Getting Started**), have your computer connected to your command station/booster with the required interface device for your DCC system, you are now ready to actually program a decoder that has been installed in your locomotive.

On opening DecoderPro, the main page will be displayed: (After preferences are set)



There are four buttons near the bottom, the first two of which are:

**SERVICE MODE (PROGRAMMING TRACK) PROGRAMMER** - With this button you select a programmer to program the locomotive (decoder) on the dedicated programming track. (Probably because the Locomotive has to be taken to the servicing track to be programmed). Not all command stations support a dedicated programming track, and some brands will shut down the mainline power when in programming mode (not pleasant when you have an ops session in progress).

**OPERATIONS MODE (MAIN TRACK) PROGRAMMER** - or **[Programming on the main (POM)]**. This lets you program a specific decoder on the layout, even while it is operating. However, because it addresses a specific decoder address, some decoders will not allow you to change the decoder's address using this method! Some command stations will only "broadcast" programming commands, which can mean every locomotive on the layout gets the same programming! The same is true if you try to program a loco with address zero (or forget to enter an address when you start). If in doubt, check your documentation.

**Help** - Accesses the help files

**Quit** - Exits the program.

Any additional buttons are added in the **preferences**.

## ADDITIONAL PROGRAMMERS THAT ARE AVAILABLE.

SINGLE CV PROGRAMMER LETS YOU PROGRAM OLDER DECODERS ONE CV AT A TIME.

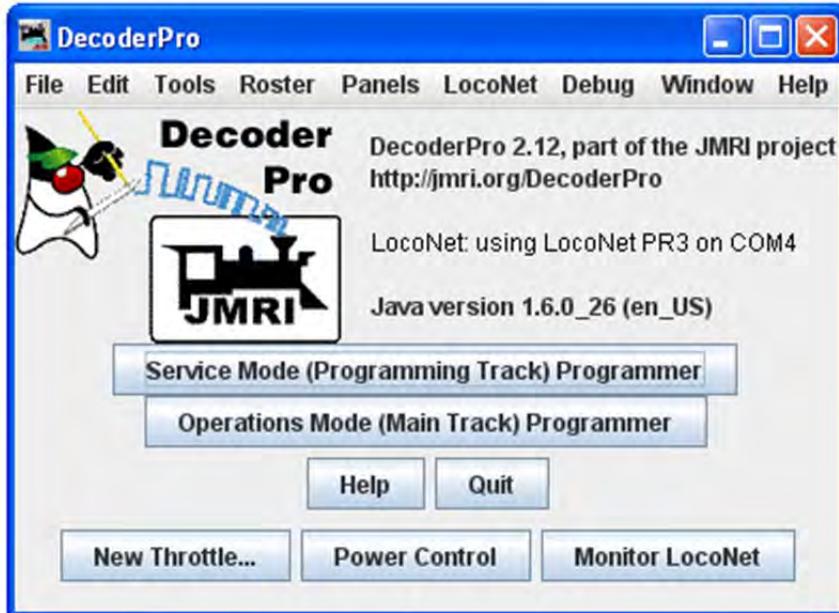
MULTI-PROGRAMMER CONTROL provides a convenient way to program CV's when you have more than one decoder installed in a locomotive. For example, if you have separate decoders to control the motor and provide sound, and they both use the same CV locations, programming one decoder would change the settings on the other, usually an undesired feature.

Now that you have decided on which Programming Mode to use, you may continue

## WHAT ARE THE PROGRAMMING MODES?

Prior to using the programmer you need to have completed the previous section (**Getting Started**), have your computer connected to your command station/booster with the required interface device for your DCC system, you are now ready to actually program a decoder that has been installed in your locomotive.

On opening DecoderPro, the main page will be displayed:



There are four buttons near the bottom, the first one which is:

Service Mode (Programming Track) Programmer

## SERVICE MODE (PROGRAMMING TRACK) PROGRAMMER - WE

WILL START WITH THIS BUTTON TO PROGRAM YOUR LOCOMOTIVE ON THE DEDICATED PROGRAMMING TRACK.

**NOTE:** NOT ALL SYSTEMS MAY SUPPORT THIS OPTION.

Operations Mode(Main Track) Programmer

## OPERATIONS MODE (MAIN TRACK) PROGRAMMER - OR

**PROGRAMMING ON THE MAIN(POM).** THIS LETS YOU PROGRAM A SPECIFIC DECODER ON THE LAYOUT, EVEN WHILE IT IS OPERATING.

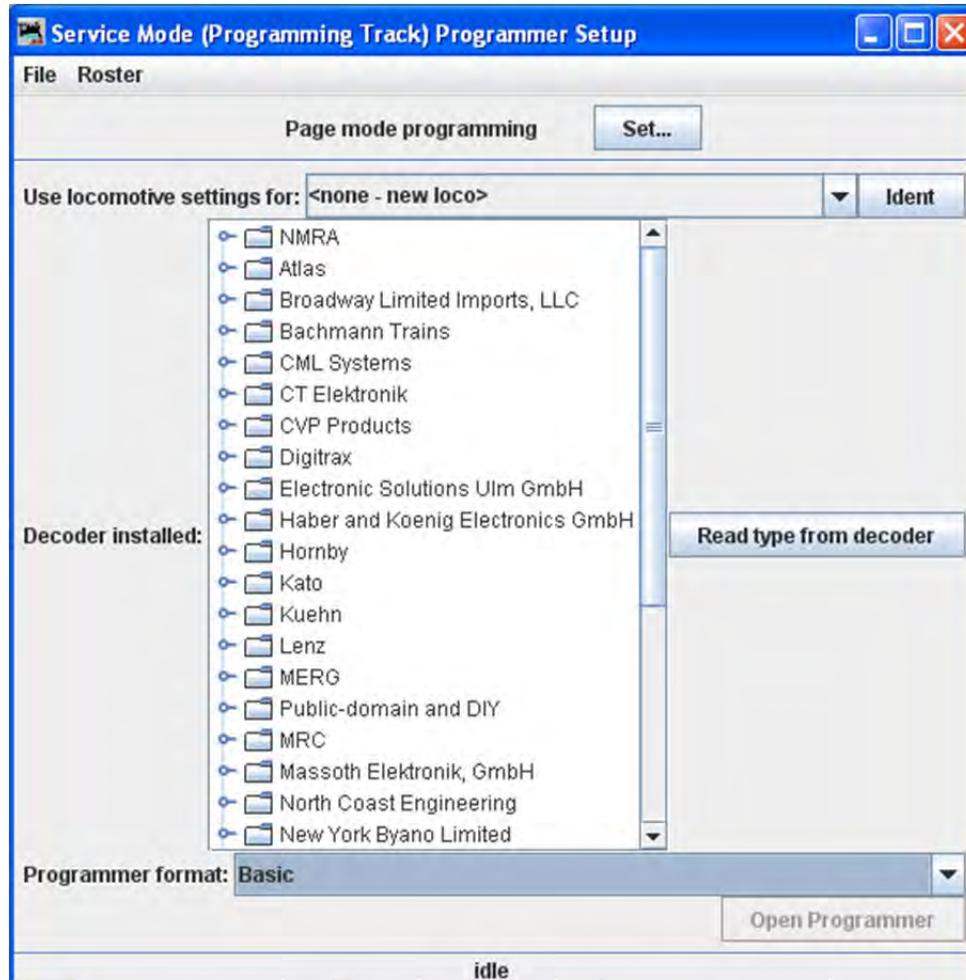
Help

- Accesses the help files

Quit

- Exits the program.

Click on Service Mode (Programming Track) Programmer and the **Service Mode Programmer (Programming Track) Programmer Setup** window opens



The first item at the top of the service mode programmer pane is a selection for the mode used to program your decoders. This is a legacy to the olden times and rather technical, but fortunately DecoderPro has matured to the point that it is quite good at selecting the best mode for you. It uses the selection of command station from your Preferences selections, combined with the decoder manufacturer and type selections (which we'll get to real soon now). Just accept what's there as a good start. And, fear not, for each pane in the programmer has a button which can be used to change programming mode if you have a problem. For further details on programming mode go to Programming modes.

## IDENTIFYING THE INSTALLED DECODER

Now let's determine the type of decoder that's installed in the locomotive that you would like to program.

The decoder identification is entered by using the selections in the middle of the page.

Since we want to know what type of decoder is in the locomotive, we can either look up what was listed when it was entered in the roster stored in this computer, or we can ask it what its manufacturer and firmware version are. The first is method is pressing the **Ident** button, and the other is pressing the **Read type from decoder** button. You can use one or the other, but they are mutually exclusive.

**IDENT** is used to identify a locomotive that is already stored in your computer's roster file. You can use the drop down arrow to display a listing of locomotives in your roster, and then select the desired locomotive from the list. An alternative is to be lazy and click the **Ident** button . The program will then query the locomotive to get its address which is linked to the roster entry. The Decoder Pro roster entry includes the decoder type used when it programmed the locomotive. If it gets a valid address, but there is no roster entry with that address, then you will get an error message.

**READ TYPE** is the other method located in the center of the page. If you click on the **Read type from decoder** button , the system will query the decoder to get the manufacturer and firmware version number. From this information it will highlight all the decoders which are known to match. There may be several, usually with differences in the physical shape and size to fit in a particular locomotive's shell, or a few more "bells and whistles". When confronted with a large selection, you can either remove the shell to try to read information printed on the decoder itself, or just select one of the ones with the fewest letters in the model number. (Letters are often used to separate the shape differences which have no bearing on the electronic functions of the decoder.) Just be aware that some functions that Decoder Pro allows you to program may not be fully operable.

As noted above, these methods will work only with command stations which are capable of reading back the contents of CV's, and the process does take some time. Many lower end and/or older systems and decoders do not provide read back capability. If the command station cannot read CV's from the programming track, you will have to select the decoder manually by using the large selection box in the middle of the page. With it you can select the manufacturer, family and specific model of the decoder. This manual method may be the best and fastest way if you know for sure "What's in there".

If you have a decoder that doesn't appear in the listing, you may want to check to be sure that you are using the most up to date version of Decoder Pro, because manufacturers are adding models almost faster than the team can enter the new decoder definitions into the files. You can choose a manufacturer's version which is as close as

## JMRI® User's Guide Version 2.12

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you can find, or if you're only interested in basic programming functions, use the NMRA® decoder which is a generic file of the CV's contained in their standards.

The last item on this pane is the Programmer Format entry. It is preset by your Preferences entry, but you can select other programmers using the drop down arrow. For now use the **Basic** programmer, because you won't be able to do much damage if you make mistakes. We'll get into the other programmers later on.

Once you have selected a decoder, or DecoderPro has done it for you, the **Open Programmer** button will become activated and you'll be able to move on with Service Mode Programming.

When you are on the **Setup Pane** and click on the **Open Programmer** button, the selected Programmer window will open. All programmers, Basic, Comprehensive and Advanced, will open to the **Roster Entry** pane.

Now let's open the **Basic Programmer**, which is now completely set-up with a decoder and the Basic programmer

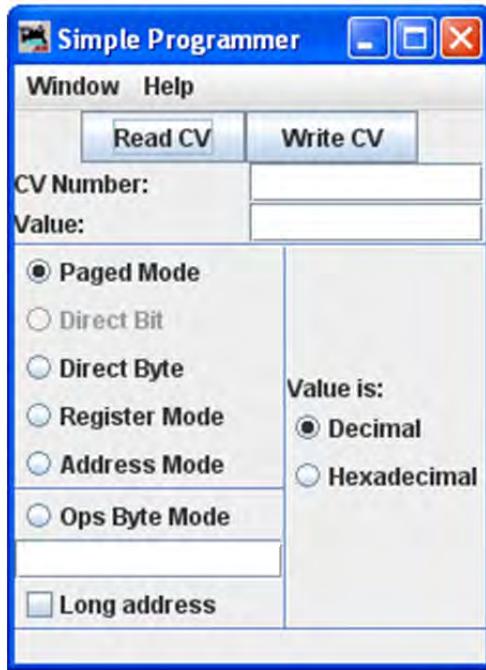
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is selected

## CHAPTER 4 - DECODERPRO® PROGRAMMING MODES

### SIMPLE PROGRAMMER

The Simple Programmer allows you to read or write CV values in DCC decoders one at a time.



Prior to reading a CV value you should enter the CV Number (address) into the **CV Number** text box. If writing a CV value you should enter the CV Number and then a value in the **Value** text box. You may enter the value as Decimal or Hexadecimal depending upon the option selected in **Value is:** area.

On the left side of the window you can select the Programming Mode. Any mode not supported by your command station will be grayed out.

If you select the **Ops** mode, which programs on the main track, you need to enter the address of the decoder (locomotive) that you are programming. Your DCC system may require you to check the **Long address** check box if the address is a long address. Most DCC systems do not allow you to read on the main, if so, the **Read CV** button will be disabled.

Now that you have everything setup, you may read the current value in the decoder's memory from the CV by clicking on the **Read CV** button or write your new value to the CV by clicking on the **Write CV** button.

### SERVICE MODE PROGRAMMER

**SERVICE MODE (PROGRAMMING TRACK) PROGRAMMER** - Select to program the locomotive on the dedicated programming track. (Probably because the Locomotive has to be taken to the servicing track to be

programmed). Not all command stations support a dedicated programming track, and some brands will shut down the mainline power when in programming mode (not pleasant when you have an ops session in progress).

## READING YOUR DECODER ON THE PROGRAMMING TRACK:

You may obtain information from the decoder on the programming track we rely on the ability of the decoder to respond to a query, what is known as **Readback**. Most decoders cannot talk to send information back to the command station. They just respond to instructions, so special instructions were developed which allow the Command Station to determine the contents of the decoder's memories

Basically the decoder is asked a whole series of questions and when the answer is “yes” it turns on the motor for only a very brief time. The command station notices the current being drawn and stops asking questions, since it got the yes answer to the last question. This can take a bit of time since the command station must ask all possible values waiting for the yes response. You can observe the process by looking down at the bottom line of all the panes (the status bar) where the word *idle* is normally shown when the programmer is inactive. When DecoderPro is working it will show you what events are being performed. Sometimes you can see the loco jump a bit as the decoder pulses the motor for “yes”. The computer folks call this an ack (for acknowledgement). When the Command Station sends the decoder data that is in agreement with what is in the CV of the decoder, the decoder will send an ack. If the ack is never received the Command Station tells DecoderPro that the Decoder did not respond.

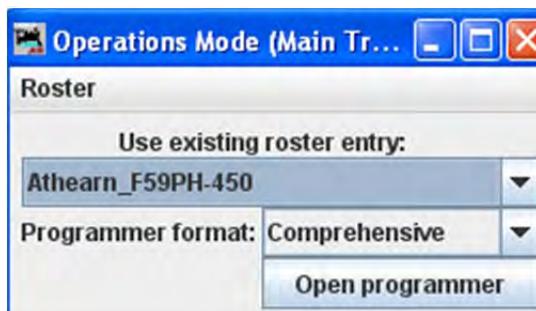
## WRITING TO DECODER ON THE PROGRAMMING TRACK:

The CV data is written to ANY and ALL decoders on the programming track. When the write has been successful the decoder will acknowledge (ack) to the Digital Command Station (DCS.) If the ack is not seen by the DCS it says the decoder did not respond. (error code 308 in JMRI)

Click on **Service Mode (programming track) Programmer** and the **Service Mode Programmer (Programming Track) Setup** window opens

## OPS MODE PROGRAMMING

**OPERATIONS MODE (MAIN TRACK) PROGRAMMER** - or **Programming on the main (POM)**. Opens the **Operations Mode (Main Track)** window This lets you program a specific decoder on the layout, even while it is operating. However, because it addresses a specific decoder address, some decoders will not allow you to change the decoder's address using this method!



Some command stations will only "broadcast" programming commands, which can mean every locomotive on the layout gets the same programming! The same is true if you try to program a loco with address zero (or forget to enter an address when you start). If in doubt, check your documentation.

**READING FROM YOUR DECODER ON THE MAIN:** With a few exceptions it is not possible to read from a CV on the Main. If reading fails it usually reports as a 306 error (Timeout Talking to Command Station.)

**WRITING TO YOUR DECODER ON THE MAIN:** Program on the Main writes are often called a "blind write" because there is no response from the decoder that the write was successful. POM is very useful for tuning loco performance while it is operating and the ack is the change in performance.

The decoder is first addressed by the Command Station, then the CV is addressed and then the data that is to be written into that CV of that decoder is sent. An exception is if address zero is used,(or you forget to enter an address when you start). Then **ALL** decoders on the main will write that data into the appropriate CV which usually is an "unintended consequence".

Some command stations will only "broadcast" programming commands, which can mean every locomotive on the layout gets the same programming! If in doubt, check your documentation.

In this window you select the locomotive in which you wish to change CV values, and what programmer you want to use. Once they are selected you click **Open Programmer** button just as you would do in the **Service Mode programmer**.

## MULTI-DECODER CONTROL

The **Multi-Programmer Control** provides a convenient way to program CV's when you have more than one decoder installed in a locomotive. For example, if you have separate decoders to control the motor and provide sound, and they both use the same CV locations, programming one decoder would change the settings on the other, usually an undesired feature.

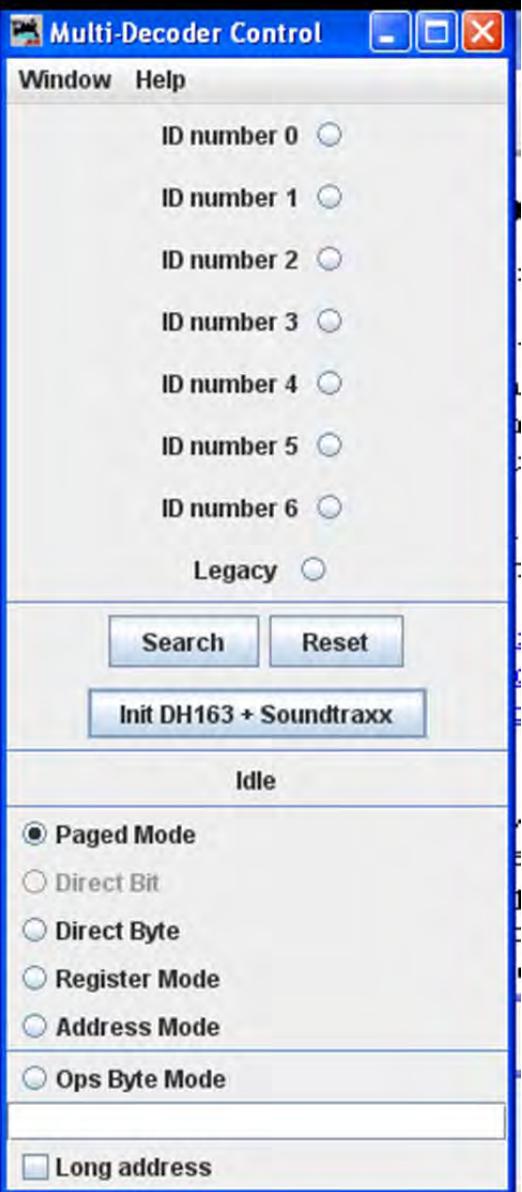
This control uses CV15 and CV16 to control writing and reading CV values. Prior to installation of the decoders into the locomotive, each one would have a separate and specific value programmed into CV16

Recommended values:

- motor decoder value of 1
- sound decoder value of 2
- function only decoder value of 3
- other uses values of 4 thru 7

Decoders should ship with the value of 0 in both CV15 and CV16, You can only perform a read or write operation on the decoder if CV15 and CV16 are the same value. In effect, CV16 is a lock and CV15 is the key. Once the decoder is locked in this way, the ONLY CV that can be programmed is CV15 (you do need to be able to unlock it).

So now you have two decoders with the same address (both of them locked) and you want to unlock one of them. The Multi Decoder Control is the tool for that.



The screenshot shows the 'Multi-Decoder Control' window. At the top, there are buttons for 'Window' and 'Help'. Below that is a vertical list of radio buttons for selecting an ID number (0 through 6) or using the 'Legacy' button. Underneath these are two buttons: 'Search' and 'Reset'. A large blue button labeled 'Init DH163 + SoundTraxx' is centered below the search and reset buttons. Below this button, the word 'Idle' is displayed. At the bottom of the window, there is a list of programming modes with radio buttons: 'Paged Mode' (selected), 'Direct Bit', 'Direct Byte', 'Register Mode', 'Address Mode', and 'Ops Byte Mode'. There is also a checkbox for 'Long address'.

If you followed the recommended values we talked about above, then you know what the un-lock number is. The **ID number** buttons numbered 0 thru 6 let you select the value to be entered into CV15 that will unlock the decoder with the corresponding number in its lock (CV16).

DecoderPro then reads back the value in CV16 to confirm that the decoder has successfully unlocked.

Once you are done with your programming the tool can again be used to insert a zero into CV15, thereby locking this decoder.

The **Legacy** button writes a 7 to CV15, which is a special case. Many decoders, especially older models, do not have this locking mechanism present. In some cases, specifically a Digitrax FX3 or later decoder and an early SoundTraxx decoder, it's possible to emulate the lock using sequential writing of the CVs. Clicking the **Legacy** button activates this procedure. Unfortunately, it's not an entirely reliable method.

But, what if you didn't follow the recommendations? The **Search** button sequentially works through the possible values and marks values found to be present. If you're dealing with a single decoder to unlock, than you're home free. If we're talking about multiple decoders with the same address we're probably going to get more than one value marked. It's up to you to figure which is which. One way is by changing the address of one and then testing to see what action changed with the new address.

**Search** button sequentially works through the possible addresses and marking those decoder addresses that are found to be present.

**Reset** button looks for possible combinations to unlock a decoder that has been inadvertently locked. Only use this option if you have just one decoder in the locomotive. If you have more than one, it will unlock all of them, which may cause confusion later.

**Init DH163 + SoundTraxx** button configures the **Legacy** mode discussed above.

Status message are displayed below the buttons, shows **idle** when no action is occurring.

At the bottom of the window you can select the Programming

Mode. Any mode not supported by your command station will be grayed out.

If you select the **Ops** mode, which programs on the main track, you need to enter the address of the decoder (locomotive) that you are programming. Your DCC system may require you to check the **Long address** check box if the address is a long address.

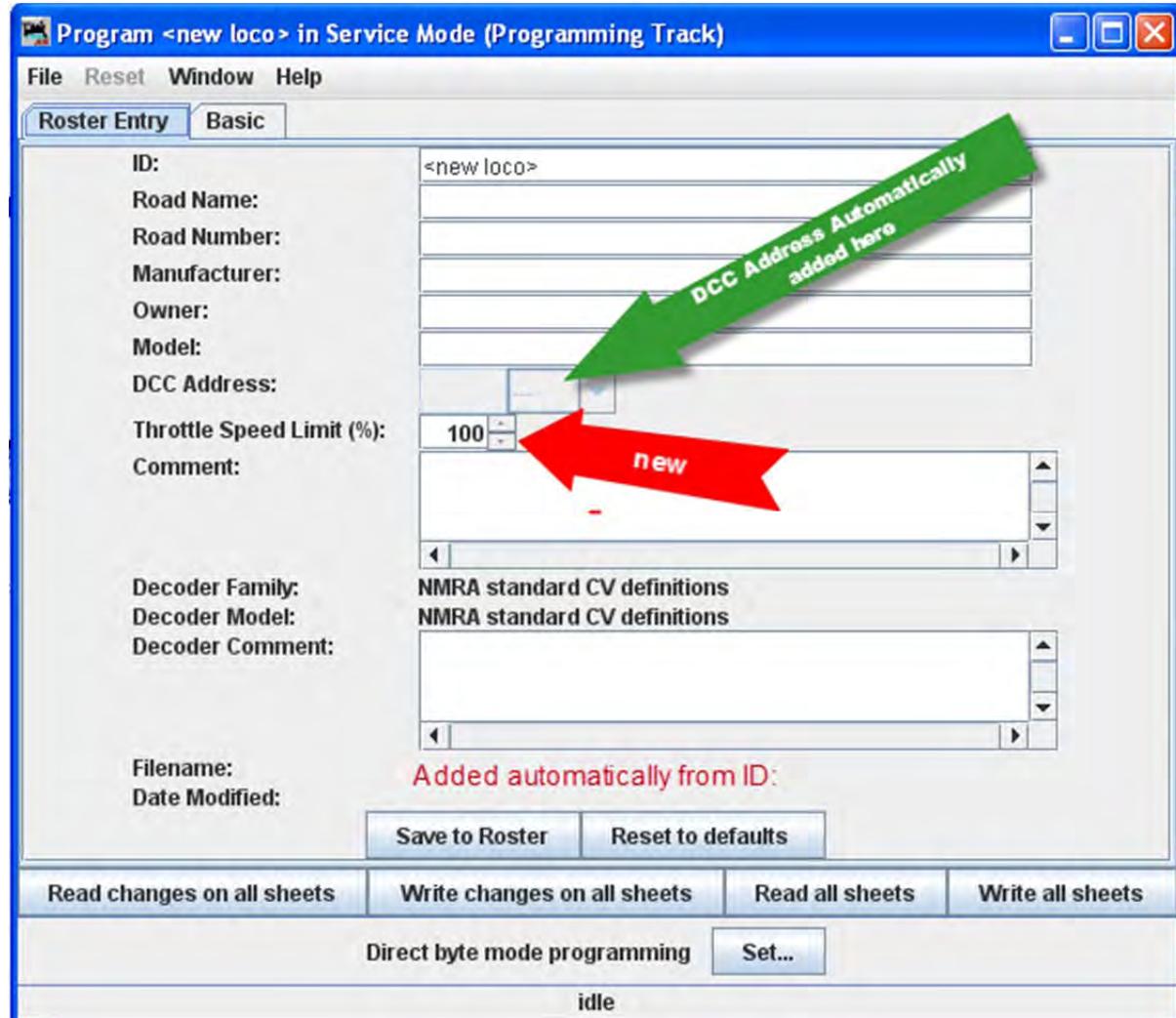


## CHAPTER 5 – THE BASIC PROGRAMMER

### THE ROSTER ENTRY PANE

The first action in programming a locomotive with DecoderPro® is to fill out the roster entry screen.

A **roster** is a database of all locomotives that your installation of DecoderPro® has programmed. It includes the information seen in the screen below:



Most of these fields are self-explanatory. However, note that the first field (**ID**) becomes the file name in the Roster for the locomotive you are programming. Set up a schema to identify your locomotive to its decoder program. i.e. Mfr, Loco Type, and Address (Kato\_SD40-2\_5645). Spaces in the ID field will be changed to underscores (\_) when the file is written. In a club environment, often the ID begins with the owner's name, or member number. This way the Roster (which is sorted alphabetically) will keep all of an owner's locomotives listed together.

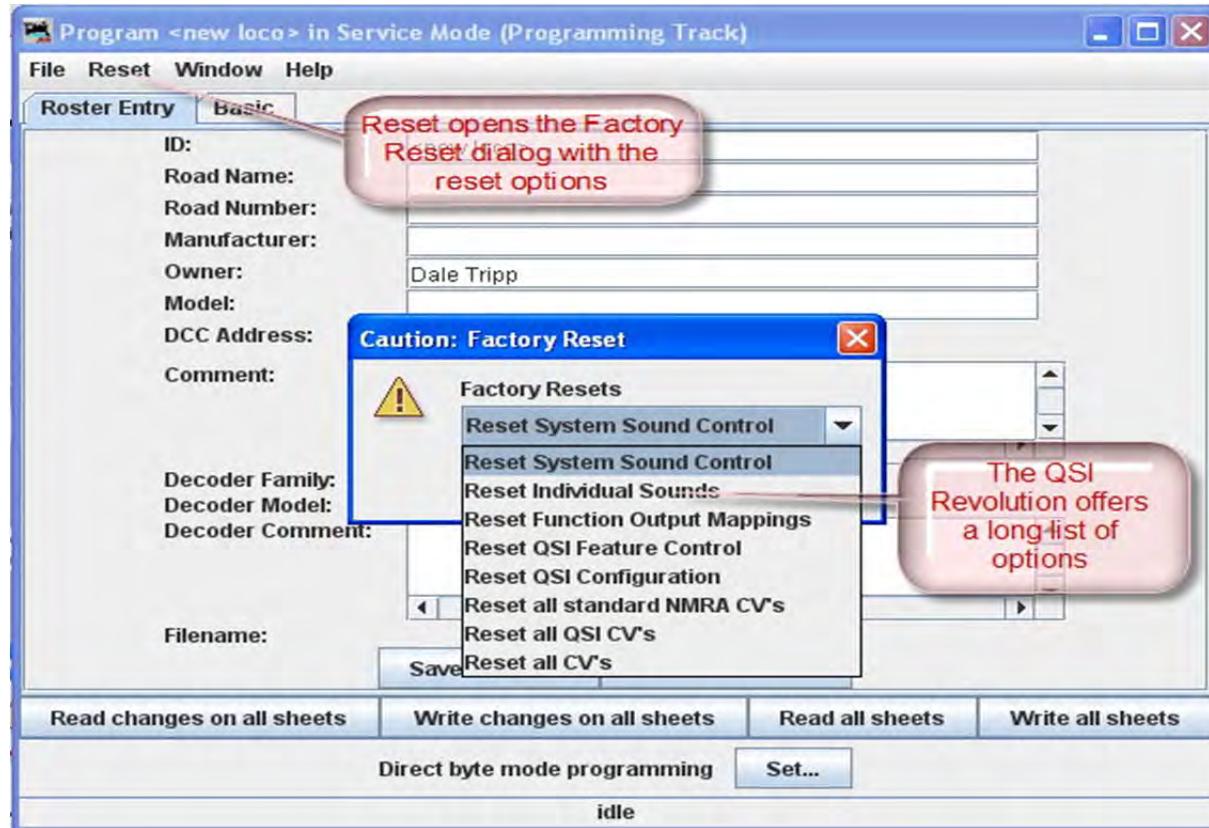
The **Decoder Comment** field is a good place to add the date you purchased the locomotive, price, or any other information you might feel is important to record.

The **Save to Roster** button stores the current decoder information to your computer hard drive and folder where your roster file is located. The default storage is the same directory where the program is installed.

The **Reset to Defaults** button can be used to return the Roster file to the condition of a new file for the type and version of the decoder listed in the roster entry. It does NOT change the values in the roster file on your hard disk, unless you specifically save it after using this reset button. It also is not written to the decoder until you specifically select a write operation. It was included in DecoderPro so that if you get hopelessly confused in proceeding screen to screen entering variables, you can return to the manufacturers baseline default set and start again.

Most decoders will activate the **Reset Menu** (next to the File menu at the top of the page). This will reset the decoder to the manufacturers default settings for all the CVs, or just some of them if the manufacturer has several reset routines. It does this by writing directly to a CV in the decoder, if the decoder has that feature, CV8 in the case of Digitrax. All decoders may not support reset and how they work is manufacturer and decoder dependent.

One decoder with a lengthy list of reset routines is the QSI Revolution decoder, which enables a drop-down list of options for resetting the decoder as shown below:



You will note that the decoder address is shown but grayed out (or blank if this is a new locomotive in the roster). This field is automatically filled in by the program and is determined from the address entered using the **Basic** tab which we will get to shortly. This address is used with the **Ident** function on the start page if you wish to recall a locomotive that is already in your roster.

The Programming mode can be changed by clicking on the at the bottom of the window. To the left of the is the current programming mode that is selected. When you click on the , the **Set programming mode** dialog box displays.

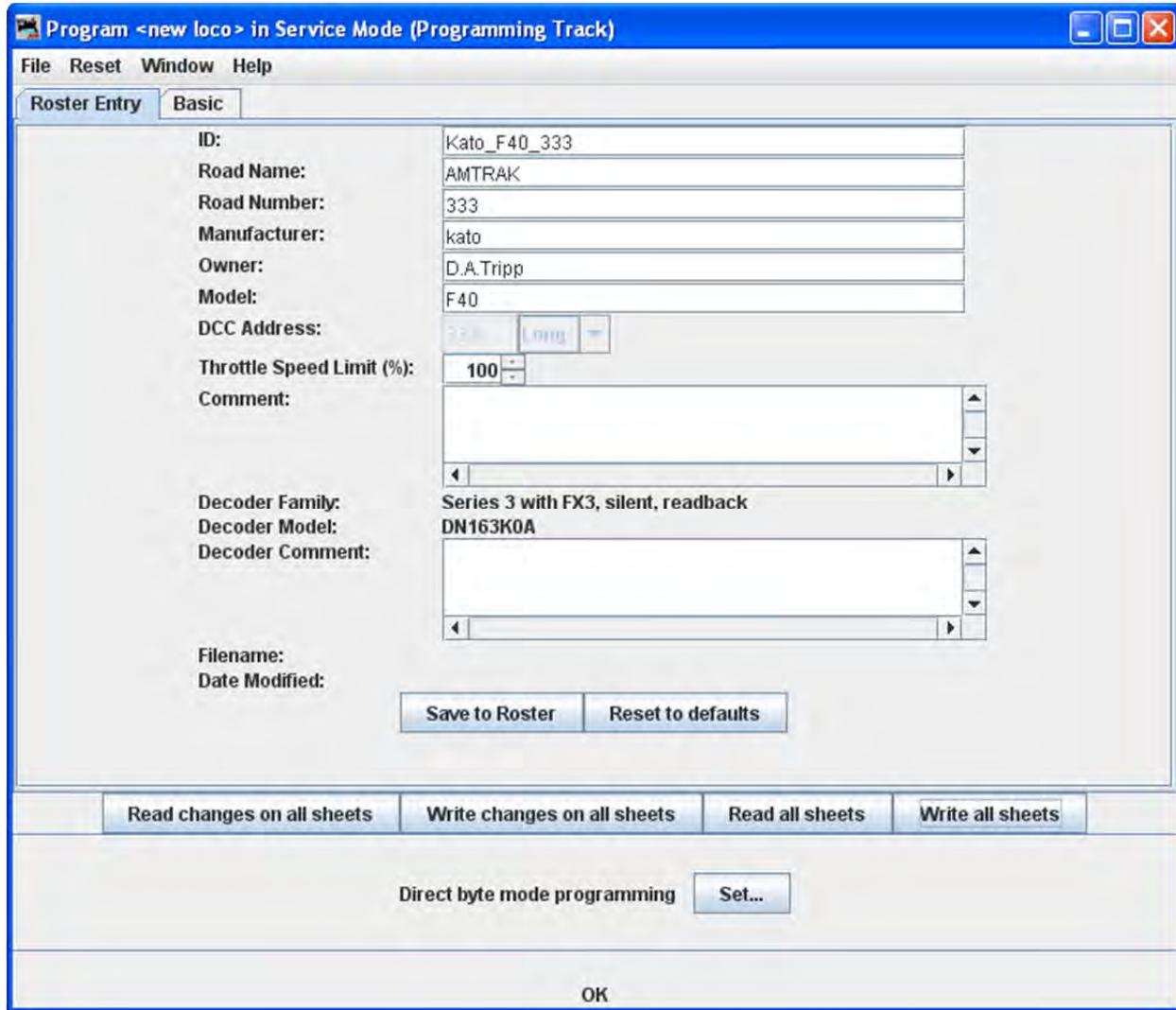


There are radio buttons for several [programming modes](#). JMRI now selects the best mode for you. It determines this from the command station type you are using and the decoder model you are attempting to program. Usually this will be OK. If you find that you are having a problem with programming you may try a different mode.

For most newer decoders, stay with **Paged mode** or whichever Direct mode your Command Station supports. Your decoder documentation should let you know if programming in some other mode is necessary... but if you are having problems, experiment. If a mode is not supported for the selected decoder and system, that option will be grayed out.

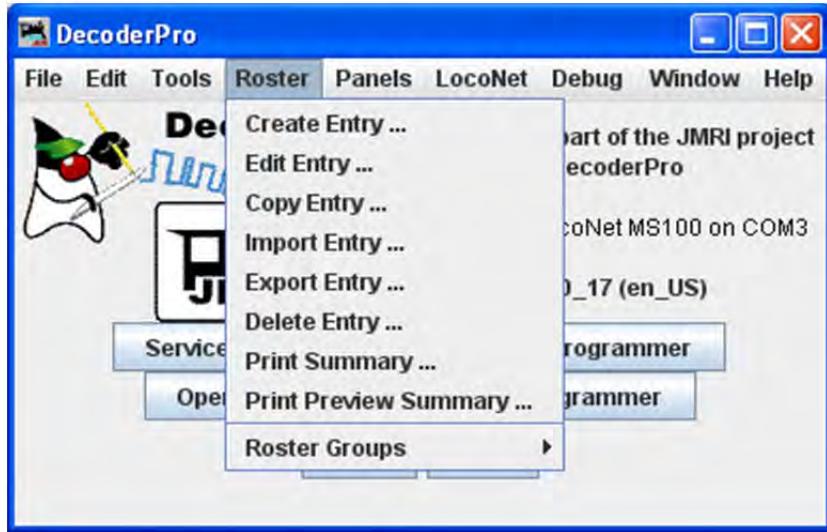
When you make your selection, the programming mode should now display to the left of the .

We will use the Basic Programming Roster setup for Kato F40 n scale with Digitrax DN163K0a decoder.



Now that we have the Roster information all in order, we can continue with programming the decoder.

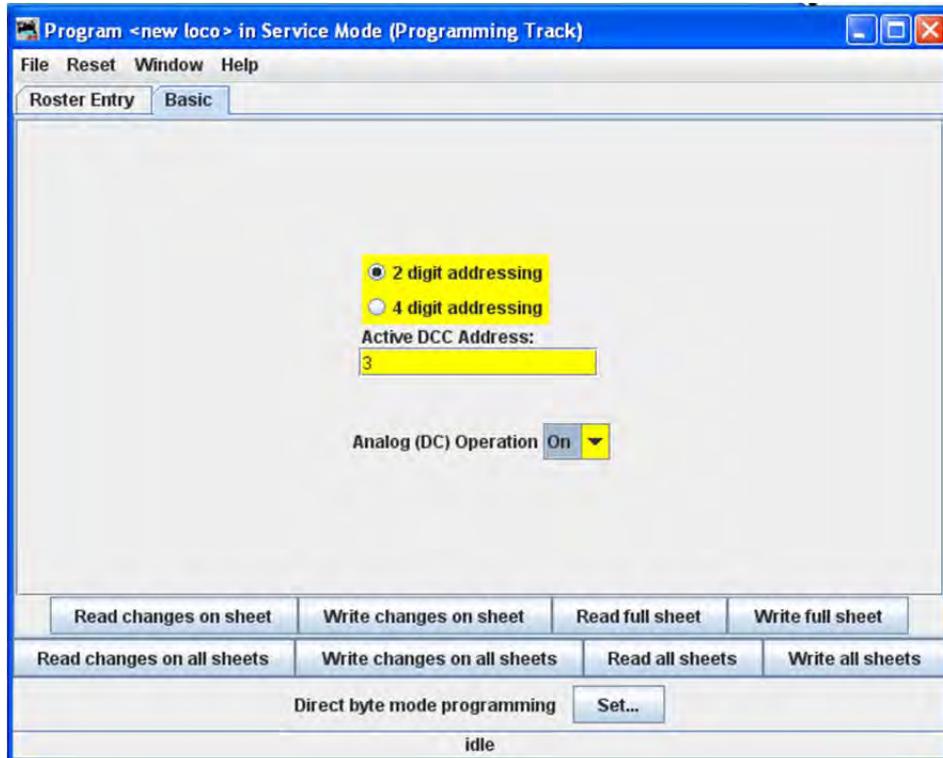
But, first a let's talk a bit about Roster management. The Main DecoderPro® window (the one where we selected the programmer) and the initial DecoderPro ®“Splash” screen have a menu called **Roster**. When you click on it you get opportunities to modify, print and move your roster files. Particularly interesting are **Export/Import** and **Copy**. Let's say you and a friend have two identical Berkshires, and you desire to have yours to be set up just like your friends. Now, you could put his loco on your track and read all the CVs out and then put them in yours, but if he lives on the other coast that's not practical. So, have him use DecoderPro® to export his loco file and e-mail it to you. You import it into DecoderPro®, change the address if you wish and then use that roster entry to program your loco. Similarly you can Copy a roster entry to duplicate one of your own locomotives into a second roster entry with its own address. Details about the [Roster Menu](#)



Let's move on to the Basic Programmer.

## BASIC PANE

You may have noticed that at the top of the window are Two tabs: **Roster Entry** and **Basic**. We have completed the **Roster Entry** pane of the Program window, now, click on the **Basic** tab to change panes to continue with programming your decoder. The Basic pane will be displayed and look similar to the following illustration: Many panes in the programmer contain decoder dependent features, as a result what you see may not exactly agree with what you see here. Only those variables that your decoder can implement will be shown.



You will see three options you can change, highlighted in yellow:

1. The decoder address (should be unique among your locomotives, unless you are operating as a set) often the locomotive number is used.
2. Two radio buttons that let you toggle between 2 digit (one byte, normal) or 4 digit (two byte, extended) addressing
3. Analog operation (enables the decoder running under regular DC voltage/analog control)

The yellow highlighting indicates these options are "probable" settings and have not been confirmed from the decoder. Settings that have been changed by the user and have not been written back to the decoder appear in a orange color. You will see examples of this throughout the manual.

To read the actual settings for these options (and IF your system and installed decoder will allow readback of decoder values), click on the **Red full sheet** button . The individual settings will turn red while they are in the process of being read (clever, eh?), and will turn white once the values have been read successfully from the decoder. Once again, Decoder Pro must play "Twenty Questions" to get this information, and sometimes even has to ask a couple of times.

Be patient, especially with older computers. At the very bottom of the pane (where it says "idle") you will see a running account of exactly what DecoderPro is doing, for example, the specific CV being read.

Again, the Read full sheet button and Read all sheets button functions are dependent on your command station. If your system does not have the capability to read CVs, then these buttons will not be available.

If you wish to change the address of the locomotive, type in the new address. To turn on or off 4 digit addressing, select the desired radio button. . Be sure that the address type agrees with the number of characters in the address.

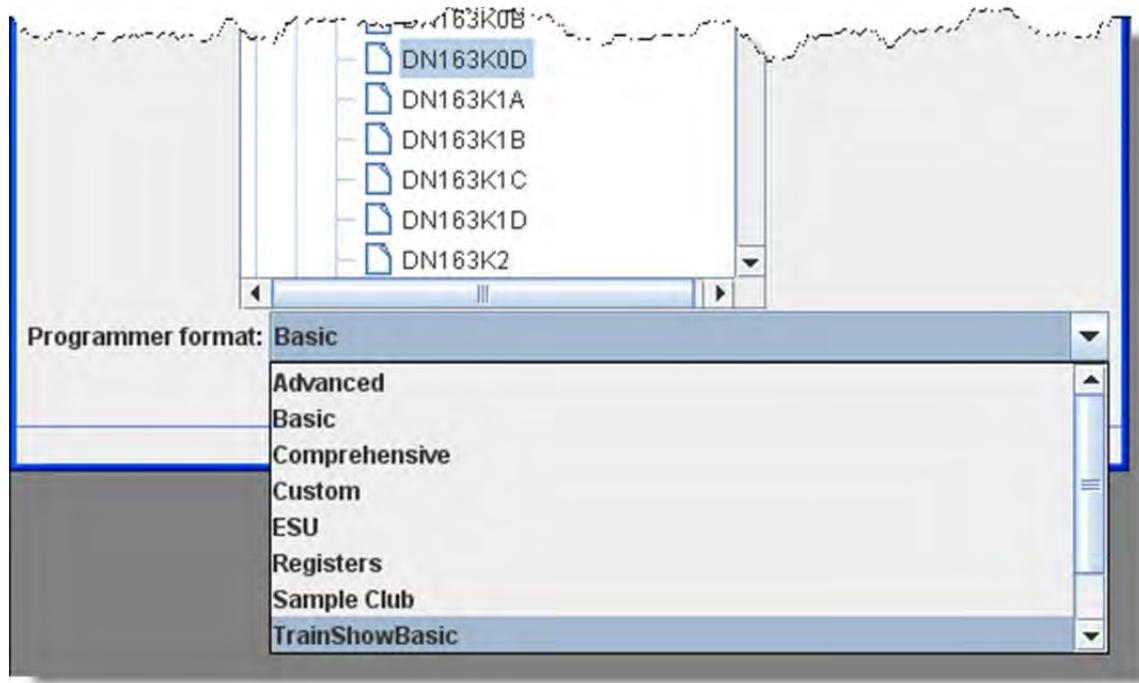
To enable Analog (old style DC, some vendors refer to this as dual mode) Operation select the appropriate entry from the drop-down list.

When you are finished, click on **Write full sheet** button to write the new values in the decoder.

Writing usually takes much less time than reading, because the value can be sent directly. As the write operation proceeds, the data will change from yellow to white. If there is difficulty writing to the decoder, the data will change to red. The software will automatically keep trying until the write operation is successful. In some instances the system will "time-out" after a certain number of tries without an acknowledgement from the decoder. This does not necessarily mean that the values have not been written, just that the program has not received an acknowledgement. This can be due to the locomotive moving and getting on dirty track so that it can't pulse back, or possibly because the command station or decoder cannot read back. Try moving the loco and try again. If it is a command station or decoder read-back issue, try the loco on the mainline and see if the programming was successful.

To finish this "basic" programming of a decoder, click once more on the **Roster Entry** tab, You will see that the address field has now been filled in, so you can now click on the Save to roster button. Your new decoder settings have now been written not only to the decoder, but also saved to a computer file where they may be recalled in the future. .

But you say..."I want to change more than what's shown on the Basic decoder pane." Well... there are other programmers that are available. But... first we need to look at the various options. In fact there are so many options the programmers had to use a slider to get them all to show. Here are the option windows. Don't panic....Most are of no use to the average user.



**Comprehensive** and Advanced are the only other programmers "*Normal Users*" will ever need, because it is, well...**Comprehensive** and the **Advanced** adds features that are optional.. So why all the others?

First of all eliminate the Manufacturer specific programmers (unless of course you have a **Zimo** or **ESU** system).

We can also eliminate the **Tutorial** and **Custom** programmers. They were put in to show folks that want to **write their own** programmer (not you right?) all the possible ways to gather input and to have a common starting point in the roster pane. Now if you wish to pursue writing a custom programmer, go to <http://jmri.org/help/en/html/apps/DecoderPro/Programmer.shtml>

If you have need for a special situation programmer you might want to look at **Sample Club** or **TrainShowBasic** to see what panes can be taken out of Comprehensive to make an intermediate complexity, special purpose programmer. Again, how to do this is a subject for another manual.

And that leaves us with the **Advanced** and **Registers** programmers. The **Advanced** programmer has a couple of sophisticated features added on top of the **Comprehensive** programmer and a name was needed. Well, why not call it **Advanced**? We'll cover the additional features once we get through with **Comprehensive**.

So what about the **Registers** programmer? If you have an old or bargain basement decoder that only programs using registers, then of course you'll be interested in **Registers**.

So now we've narrowed our "real" choices down to **Advanced**, **Basic** and **Comprehensive**. Since we've already covered **Basic**, let's explore the **Comprehensive Programmer**!

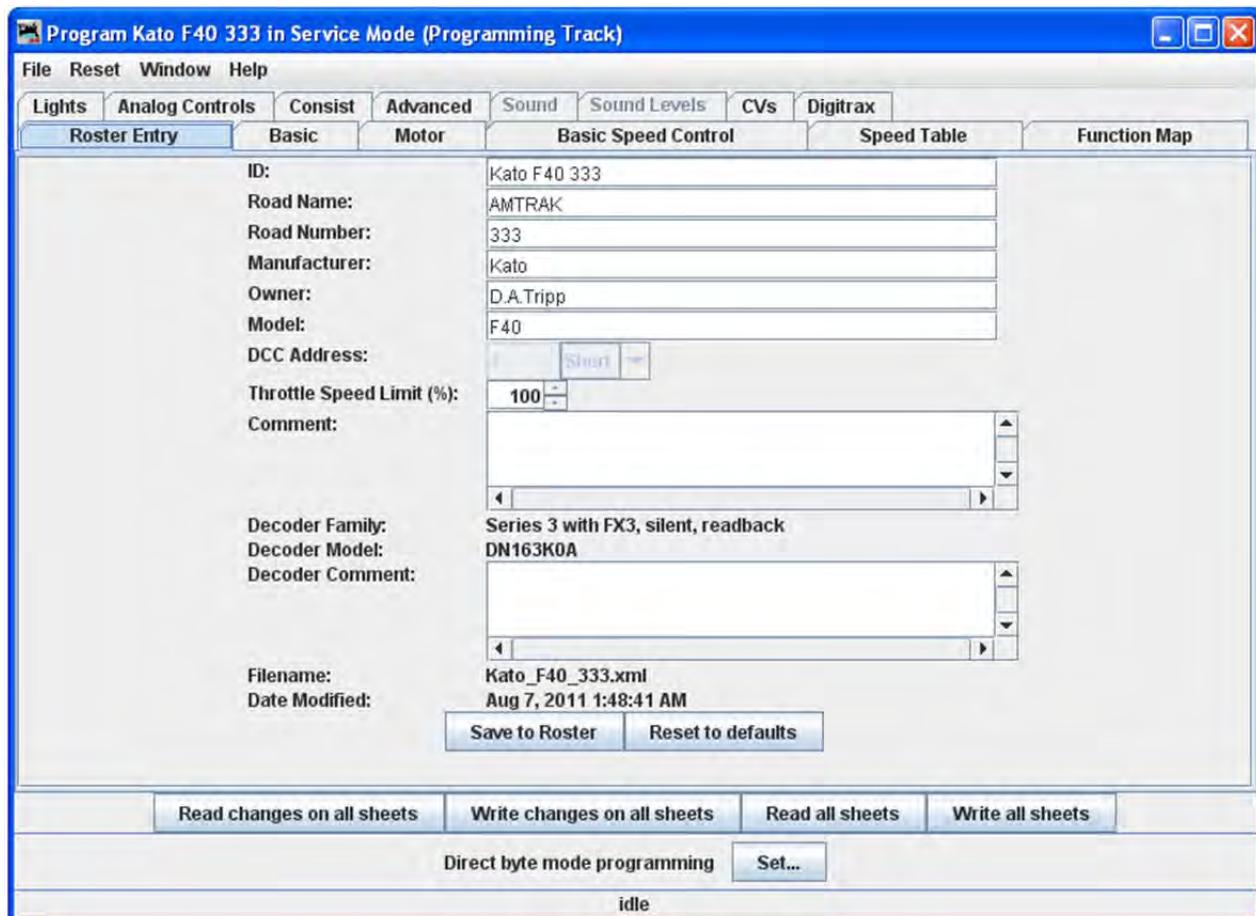


## CHAPTER 6 - DECODERPRO® COMPREHENSIVE PROGRAMMER

### ROSTER ENTRY PANE

The Comprehensive Programmer begins the same way as the Basic Programmer, with a Programmer Setup Pane and a Roster Pane. The content are identical, so they will not be repeated here. Just be sure to select the Comprehensive Programmer on the Setup Pane. ([Tab Programmer Setup](#)),

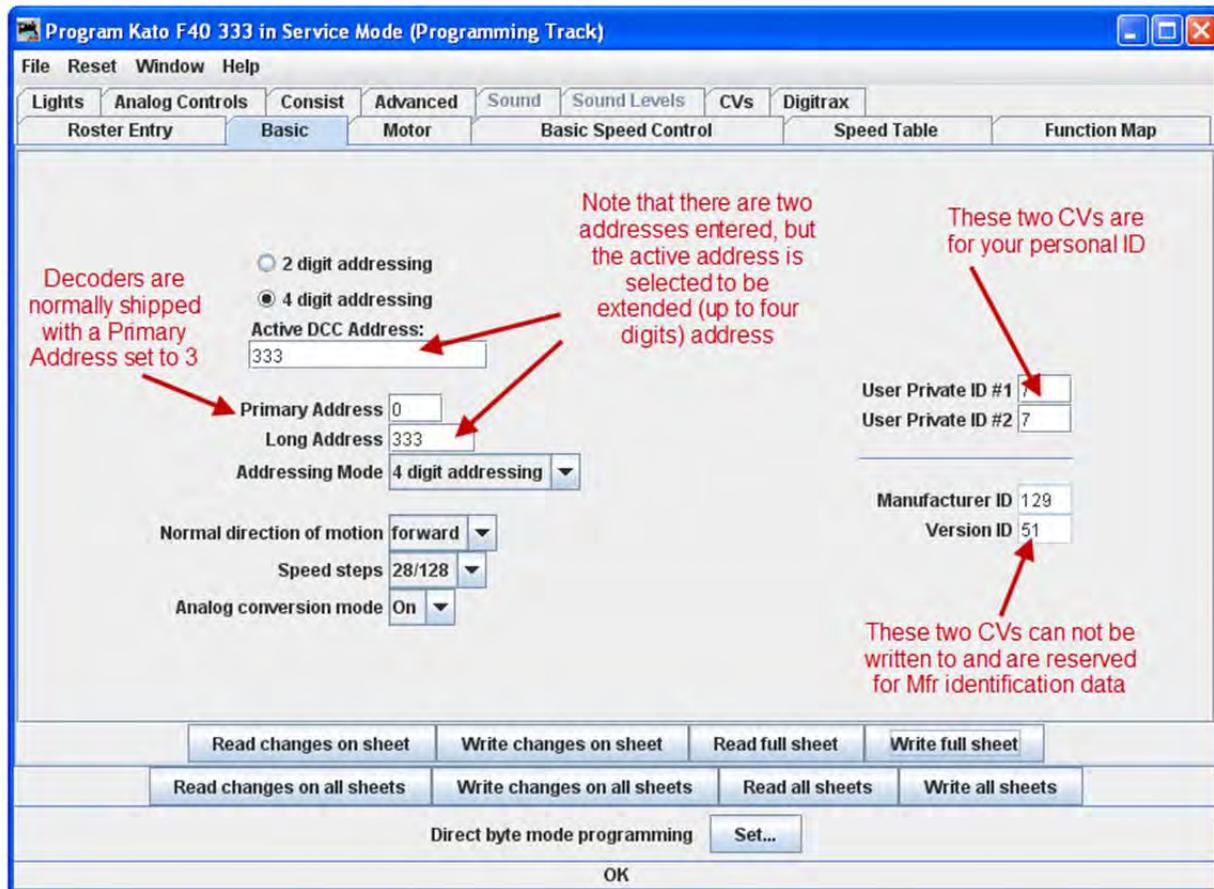
When you are on the **Setup Pane** and click on the **Open Programmer** button, the appropriate Comprehensive Programmer window will open. All programmers, Basic and Comprehensive, open to the Roster Entry pane, which will be similar to that shown below. (Using Digitrax DN163K0a decoder examples)



Note that the **Roster** pane is essentially unchanged from the **Basic** programmer, but the window has a LOT more options in the **Tabs** at the top! If you are unsure how to handle the **Roster** information, go back to that section in the [Basic Programmer](#). If you're ready to move on to bigger and better things, let's go to the next tab, the [Expanded Basic Tab](#).

## EXPANDED BASIC PANE

One of the first things you will notice about the expanded Basic Pane in the Comprehensive Programmer is that there are a lot more options than you found in the Basic Programmer.



Select 2 or 4 digit **addressing** radio button to select which mode of addressing you wish to be active

You can enter locomotive addresses in both the **Primary address** and/or the **Extended address**. The address of a decoder is the prefix for the code it responds to. This is how you are able to run multiple locomotives on a single line and keep all their speeds and functions independent. Decoders originally could have only a two digit address... after all, who could possibly need more than 100 locomotives? Some lower-end command stations and decoders still use only two digit addressing. Newer decoders can have up to a four digit address. The "**Addressing Mode**" option lets you choose between two and four digit addresses. The addresses themselves are input into the appropriate text boxes. The "**Extended Addressing**" check box turns on and off the 4 digit address mode. This allows you to have two different addresses stored in a decoder, and toggle between the two. Great for locomotives with separate decoders for the motor and for sound. Exactly how folks are implementing this is beyond the scope of this manual.

Set the **Locomotive direction: normal** or **reverse** from the drop-down list. The option for **Normal direction of movement** is important for people who model railroads like the NS, who ran diesel locomotives long hood

forward, or for the person who occasionally makes a mistake and hooks the decoder up in reverse. It lets you change the direction defined in the decoder as "forward" (no disassembling and rewiring).

**FL Location:** Unless your command station or decoder can only handle 14 speed steps, you'll find you get much finer control of your locomotives by using the **28/128 speed steps** option. If you happen to set the decoder to 14 speed steps by mistake, and your command station is in 28 step mode, you will find that the headlight will turn on an off as you move through the speed steps.

**Power Source Conversion** mode allows the decoder to run under regular analog DC voltage control or DCC commands. If you find that your locomotive is "breaking away" and running out of control at high speed on a DCC layout, you might want to disable this capability. Decoder equipped locomotives tend to run slower when they are on a conventional analog layout, and lighting functions will be dim or off at low speeds because sufficient voltage is not available.

**User ID #1**" and **User ID #2** (off to the right} there are two CVs that have nothing to do with any function of the decoder. They simply provide you with a method of electronically marking your equipment. Use these CVs, even though you may have custom-painted equipment for your own freelance railroad - it provides one more way to identify your decoders if they are removed from the loco.

## THE READ AND WRITE BUTTONS

At the bottom of all the programmer panes you will find three rows of buttons, as shown :



The top row operates **ONLY** on the currently visible pane. These buttons are:

1. **Read changes on sheet** - an "Oops!" button that lets you recover data from the decoder if you've changed it accidentally on the computer (and don't remember what the values were!), but only if you haven't written it yet.
2. **Write changes on sheet** - faster than writing all the data on the sheet, and ideal for tweaking changes in **Ops mode**, programming on the main track.
3. **Read full sheet** - read all data in this pane from the decoder.
4. **Write full sheet** - writes all data in this pane to the decoder.

The second row of buttons performs essentially the same functions, but on the **entire range** of CVs for the decoder. This allows you to read all CVs, for example, or to make a series of changes across several panes, and when done then write them all to the decoder. Again, you have the option of reading/writing only the changed data, or all data.

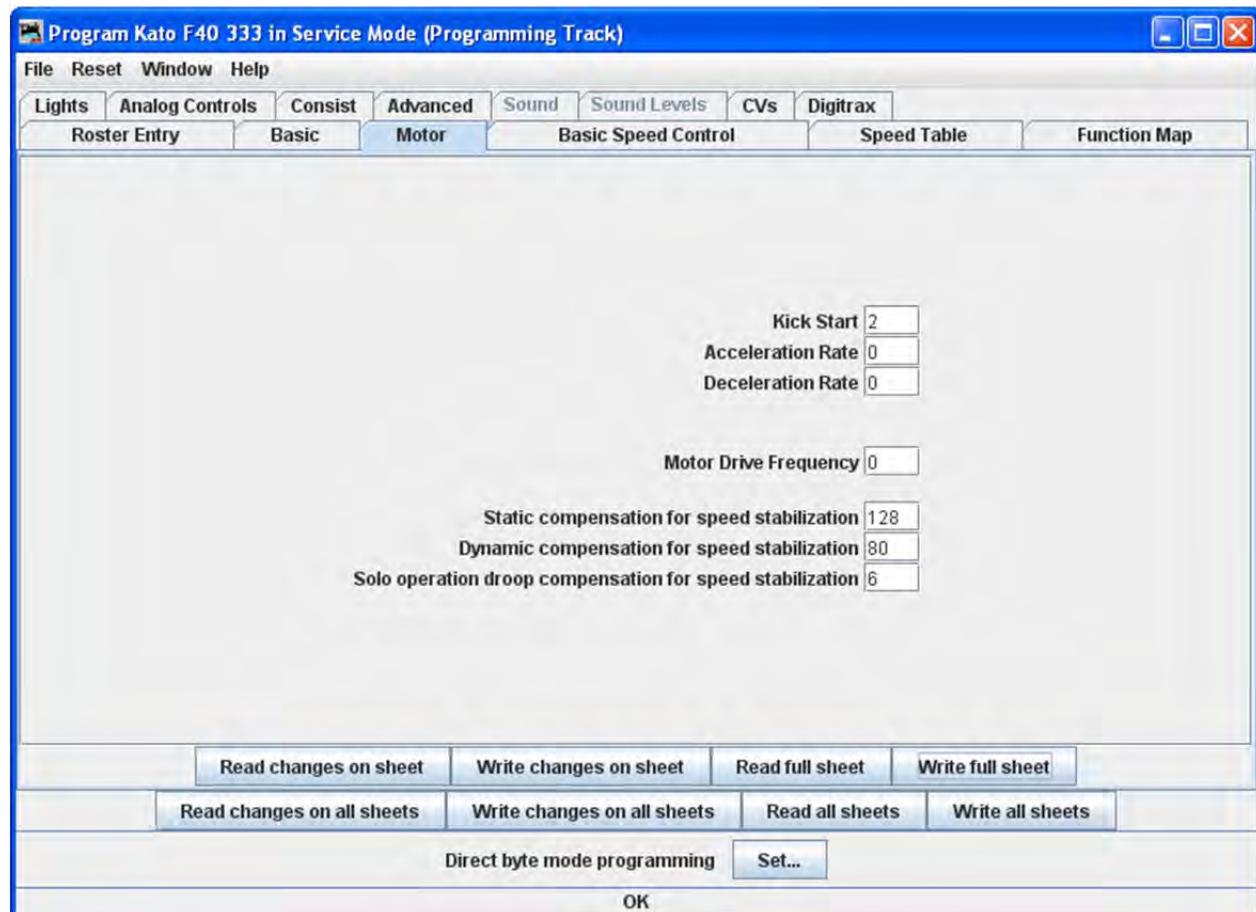
Below the two rows of buttons is a text line that shows what the current **programming mode** is, and a **Set...** button that allows you to change it without exiting the programmer. [click here](#) for further information on Programming Modes.

Finally, the bottom line of the pane is a status bar that tells you exactly what the system is doing. It shows **idle** in these screen shots because the system was not actively programming decoders when they were made.

## MOTOR CONTROL PANE

Motor control is divided into three separate panes. The **Motor Control pane** deals with CV's for simulating locomotive weight or inertia. The [Basic Speed Control pane](#) deals with basic motor control CV's and the third [Speed Table pane](#) covers those dealing with the Speed Table method of controlling the motor. These last two methods of motor control are mutually exclusive. The selection is made with a radio button at the top of each of those two panes. The default selection is Basic Speed Control.

### The Motor Pane



The contents of the Motor pane will vary significantly between different brands and models of decoders. In the case of the decoder shown in the illustration:

**Kick start** is an extra burst of power at the first speed step to help start balky motors. Compare this to the "Minimum voltage" CV we'll see in the [Basic Speed Control](#) pane, which is a sustained increased level of power. Between the two it is quite possible to tune a decent quality locomotive so that it creeps at less than a tick a minute.

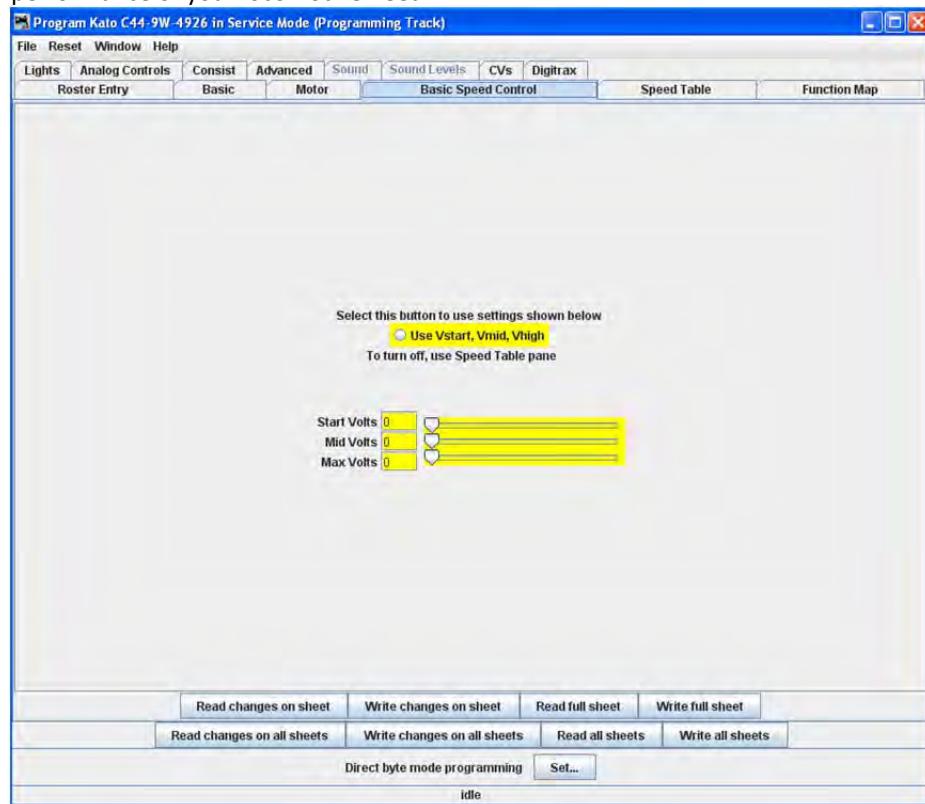
**Acceleration Rate** and **Deceleration Rate** help simulate a locomotive under load - but don't use them unless you have very clean track, because an interruption of power can make a locomotive stop and cycle through the acceleration curve again! On the latest Tsunami Diesel sound decoders the firmware has been changed. The decoder now returns to the last speed setting before the power interruption but it has no knowledge of where it was in the acceleration curve. So if you have been in the habit of using lots of momentum and setting speed to maximum to get the sound of a notch 8 motor, be aware that if the loco loses power for just an instant from a dirt spot on the rails, it will resume at the top speed step and appear to be running away.

High deceleration rates can make station stops and switching realistic, but very challenging!

**Back EMF or Speed stabilization** is implemented differently by each manufacturer.. See your decoder documentation for the best ways to implement these variables, and be prepared to do a lot of experimenting! However they do it and whatever they call it, you should find it in this pane.

## SPEED CONTROL PANE

The **Speed Control pane** looks very complicated, but it can be one of the most significant in improving the performance of your locomotive fleet.



Let's look first at the top of the pane: You now have the option of using Basic Speed Control (this pane) or Speed Table to control your locomotive's speed. Whichever one you select last and write to your decoder will be the method used for speed control. To select this pane:

Click on the **Use Vstart, Vmid, Vhigh** radio button.

Three important CVs are programmed in this pane Vstart, Vmid and Vhigh. They work together to make a very basic three point speed table. On some decoders these settings may be labeled differently and all three may not be available. Decoder Pro will show the correct options for your selected decoder.

**Vstart(Start Voltage)** is the voltage at the first speed step. If your locomotive didn't start moving until there were three volts on the track with analog power, this lets you set up the decoder to give it 2.99 volts right away, so it will start moving when you advance the throttle.

**Vhigh(Top Voltage, Max Voltage, Maximum Voltage)** is the maximum amount of power the locomotive will get from the decoder. If your locomotive looks like Chuck Yeager's X-1 at full throttle, then you can trim the top speed down to a more reasonable scale level.

**Vmid(Mid Voltage, Midpoint Voltage)** lets you configure the slope between **Vstart** and **Vhigh** a bit, so that if your locomotive reaches full speed at 5 volts, you can stretch out the lower end of the curve to get more fine control in a useful speed range.

If you are having problems with unpredictable speeds with your locomotives, check these settings. Sometimes, one or more of these settings have been changed accidentally (usually due to an error in programming CV's with a throttle), leading to very odd speed performance. In particular, if the **Vmid** is lower than **Vstart** or higher than **Vhigh**, results can be highly unpredictable. Decoder Pro will not let you make this mistake.

**Forward Trim** and **Reverse Trim** allow you to compensate for differences in the forward speed and reverse speed of the locomotive. Most model locomotives do not run at exactly the same speed forward and backward due to the motor mechanics and the gear train to the wheels.

The settings for these controls are not as intuitive as you might think. A setting of 0 in these CVs turns them off. However, a setting of 128 in either of them will have no visible effect! To make the forward and reverse trim effective, raise the value above 128 to increase speed, and lower it below 128 to decrease speed in this pane. The Forward and Reverse Trim does not work the same for all decoders, with variations between manufacturers.

*Some suggestions on using the basic motor controls and programming on the main.*

Unless you want to get into some precision speed matching, you probably won't need to use the **Speed Tables** you'll see on the [Speed Table pane](#)- you'll be able to accomplish much of what you want using just **Kick start** ([previous pane](#)), and **Start Volts**, **Mid Volts**, and **Max Volts** if they are available in this pane... but how to do this?

Start with the **Kick start** value, and [Programming on the main](#) rather than the programming track. Set the locomotive to be programmed on throttle step 1. If it moves at all, don't change the **Kick start** value. If it doesn't move, slowly step up the throttle until it does. Then, turn the throttle down. If the locomotive stops at the same setting it started, you won't need to set the **Kick start** value. However, if it continues to run at a slower speed than it would start, then increase the **Kick start** value until it will start and run at its slowest possible speed.

Now, if the locomotive isn't running at throttle step 1, increase the **Start Volts** value (and write it) without changing the throttle until the locomotive barely crawls... you can usually get this down to a speed of a tie a minute or so if you like! Remember, you are doing this in "**ops mode**", so you can make these changes while the locomotive is actually running. Don't forget to write the value changes to the decoder - they won't take effect unless you do.

Now, set the top speed of the locomotive. Run the throttle up to full, and lower the **Max Volts** value (and write it) until the locomotive runs at the maximum speed you want it to reach, but don't forget that adding a train will slow it down!

Finally, set the **Mid Volts** value about half-way between **Start Volts** and **Max Volts**. Setting it above or below the median of the **Start Volts** and **Max Volts** values will give you a crude, three point speed table.

There are no hard and fast rules for the exact numbers to use. Even identical locomotives with identical decoders will need different numbers, due to variances in motors and drive trains. Experiment with the settings - Decoder Pro makes it easy!

Note: Not all decoders will have Start, Mid and Max Volts, but will have some version of this which will be displayed by Decoder Pro for the specific decoder.

If you select [Speed Table](#) all of the settings in this pane are ignored.

## SPEED TABLE PANE

The **Speed Table** allows you to fine-tune the throttle response of your locomotive. You might opt to match all of your locomotives so they run at the same speed for the same throttle setting, or you might want to set the table up so that your locomotive runs at the actual scale speed indicated by the throttle. Or maybe you have someone in your operating group that likes to switch the yard at Mach 2.5, and you want to slow them down a bit. There are a lot of ways to use this feature. (This feature may vary by manufacturer and decoder series)

You now have the option of using **Speed Table** (this pane) which if selected and written to the decoder will replace the [Basic Speed Control](#) to set your locomotive's speed control mode. Which ever one you select last and write to your decoder will be the method used for speed control. To select the use of speed tables, the **Use Table** radio button is selected at the top of the pane, and in the case of Soundtraxx and QSI decoders, the drop down selection box must be used. See the discussion at the end of this section for an example.

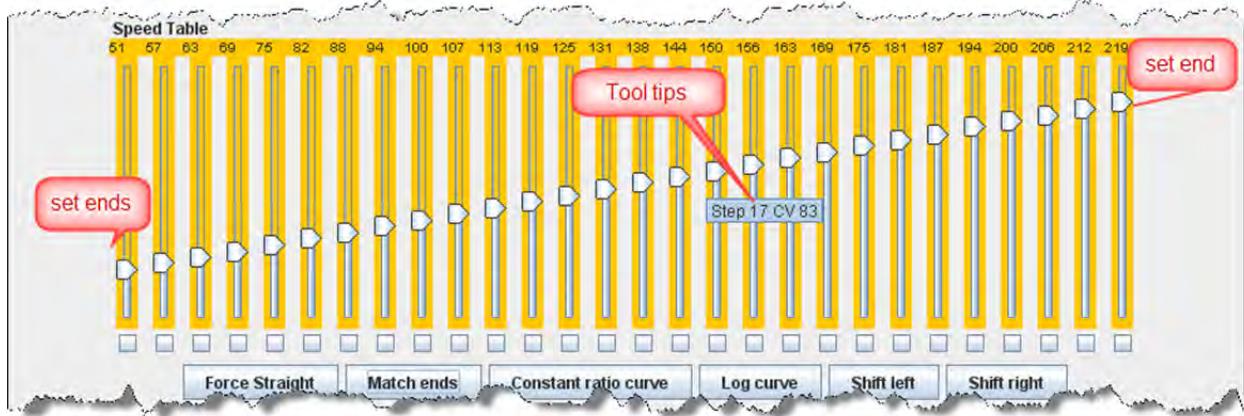
The default speed table for most decoders is a straight line from zero on the left to maximum on the right. The below the table duplicates that in the table..



## STRAIGHT LINE SPEED CURVE

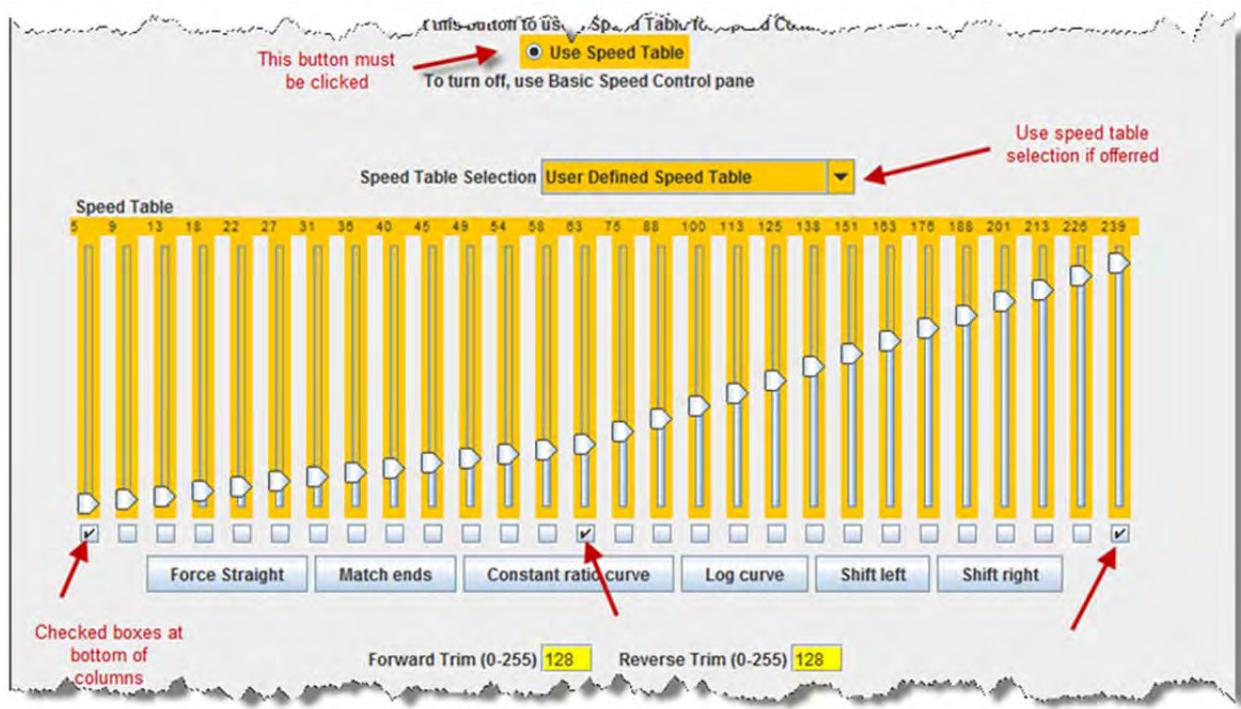
As you can see, you have both numbers and sliders to work with. Changing either a number or slider will make the other change to match it. If you are CV inquisitive, you can use the tool tip to advantage. By hovering over any of the sliders, the tool tip will reveal the CV to which you are pointing .

The will also result in a straight-line graph, but you can offset the beginning and end by any amount you wish. The first and last steps are used to set to minimum and maximum values for the straight line. The function will then draw a straight line between those two end points. Below is an example of the result.



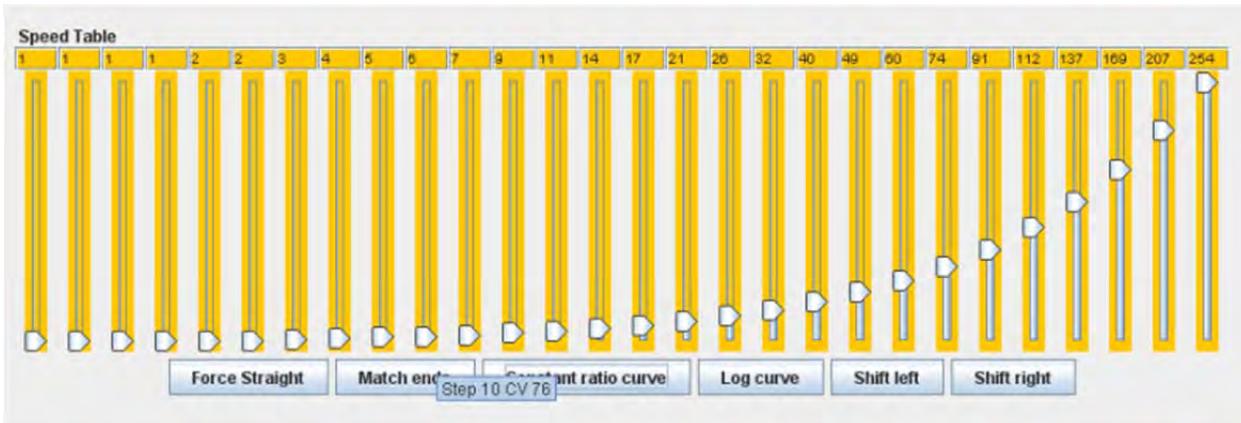
Now if you've used DecoderPro in the past, you're probably wondering what those little boxes at the bottom of each slider are used for. Well, they're difficult to explain, but easy to use. They basically allow you to set a slider to control every slider in columns to its left as well as to its right. If you click two of the boxes and then move one of those sliders you'll see that they are linked to the sliders between them. Points to the right never are higher than the slider being moved, and the points to the left are never lower than the slider being moved. This "always increasing left to right" is normally the way the sliders worked, but now the ones in between the check are linked. If the slider is lowered and then raised the straight line is drawn between the column checked to the right and the column that the slider is controlling. It's difficult to describe, but try it and you'll see.

What could that possibly be used for, you ask? Well, many decoders (like the Soundtraxx Tsunami in this example) do not support V-start, V-mid and V-max. So, if you are trying to use the simplified method of speed matching locos, these decoders won't support it. Well now you have a way. Check the left-hand, right-hand and middle columns. Set the left-hand column to V-start, the right-hand to V-max and then slide the middle slider up and down until you get the V-mid that you want. Now all you have to do is write this speed table to the loco and you've accomplished what you wanted to do, but the decoder manufacturer didn't provide for.



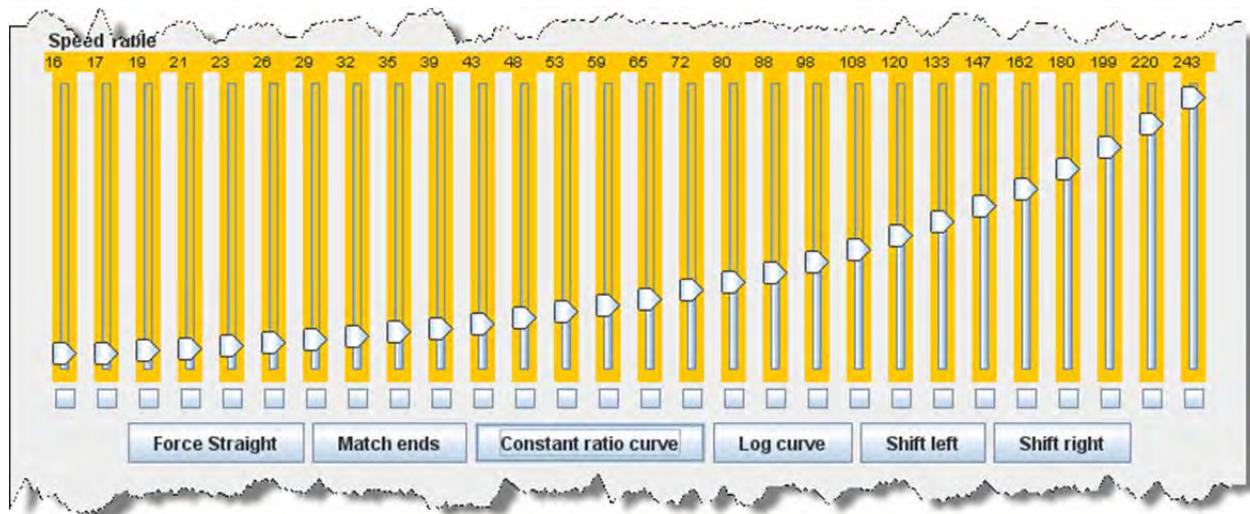
## SUBSTITUTE FOR QUICK SPEED MATCHING

If you want to set up a loco for switching you can set a start speed that is the same for the first portion of the throttle revolution and lower the top speed for use in the yard as shown below:



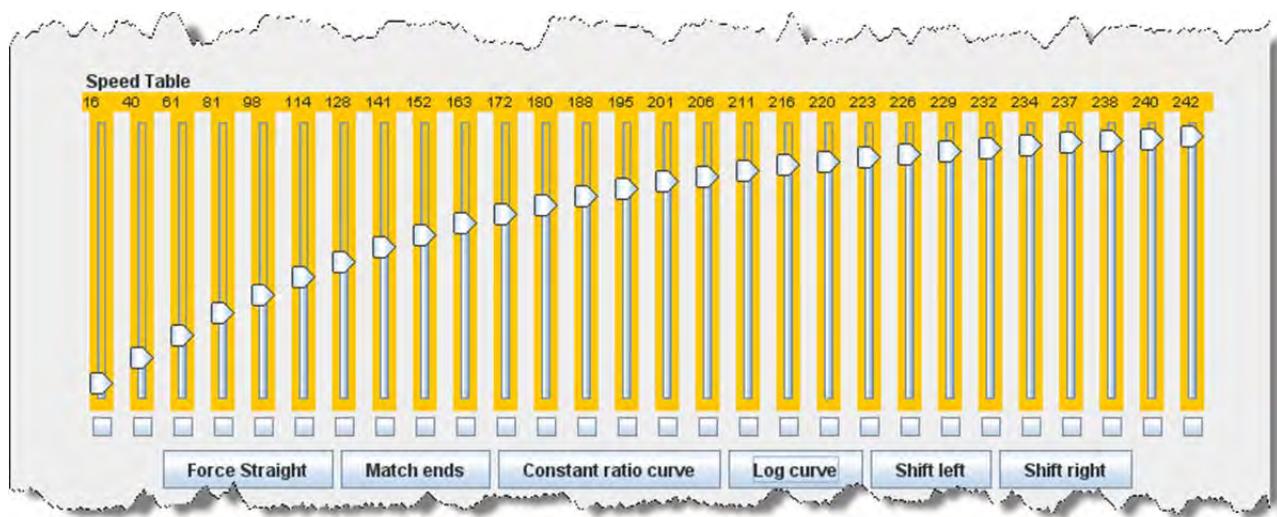
## SWITCHER SPEED CURVE

if you don't desire a strait-line response curve there are other options available. The Constant ratio curve gives you a response that increases slowly in the low end and rapidly at high throttle. This function will also draw the curve between preset end points.



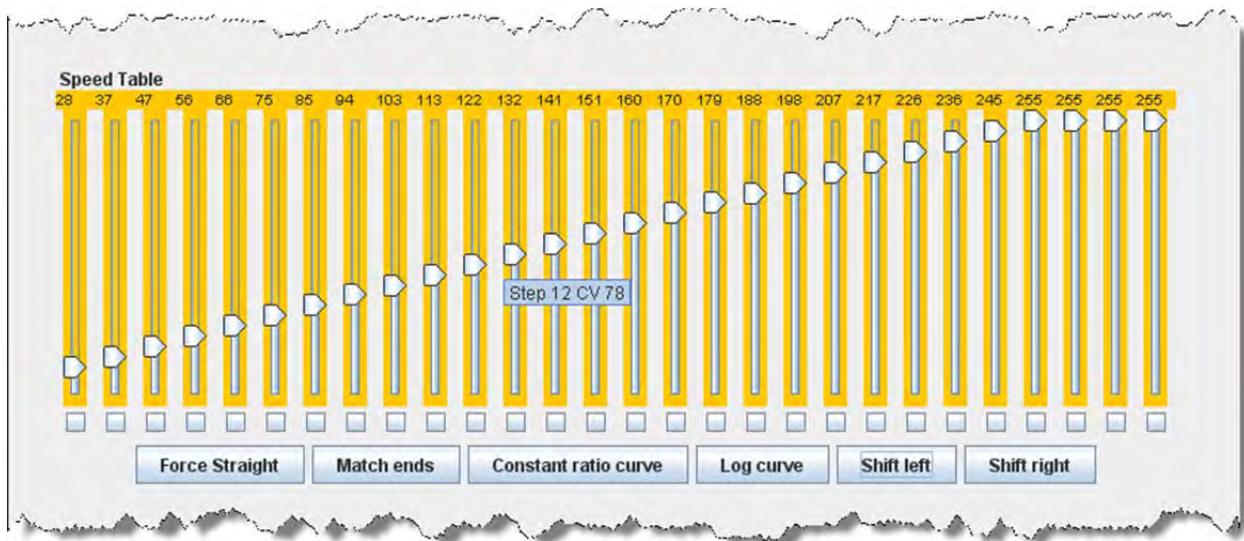
## CONSTANT RATIO CURVE

The **Log curve** reverses this response, giving you a logarithmic response curve with high acceleration at low speeds, but topping out quickly. It will also draw the curve between preset end points.



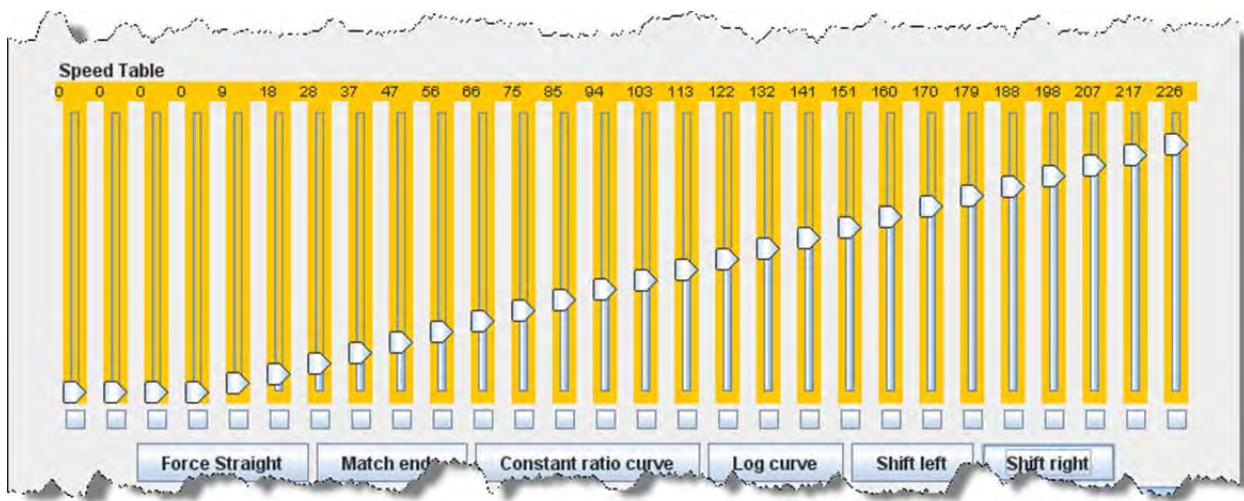
## LOGARITHMIC SPEED CURVE

The moves the entire speed table to the left one space with each click on the button. The example below shows a linear 0-255 speed table that has been **Shifted left** three times.



## CURVE SHIFTED LEFT

The move the entire speed table to the right one space with each click on the button. The example below shows a linear 0-255 speed table that has been **Shifted right** three times.



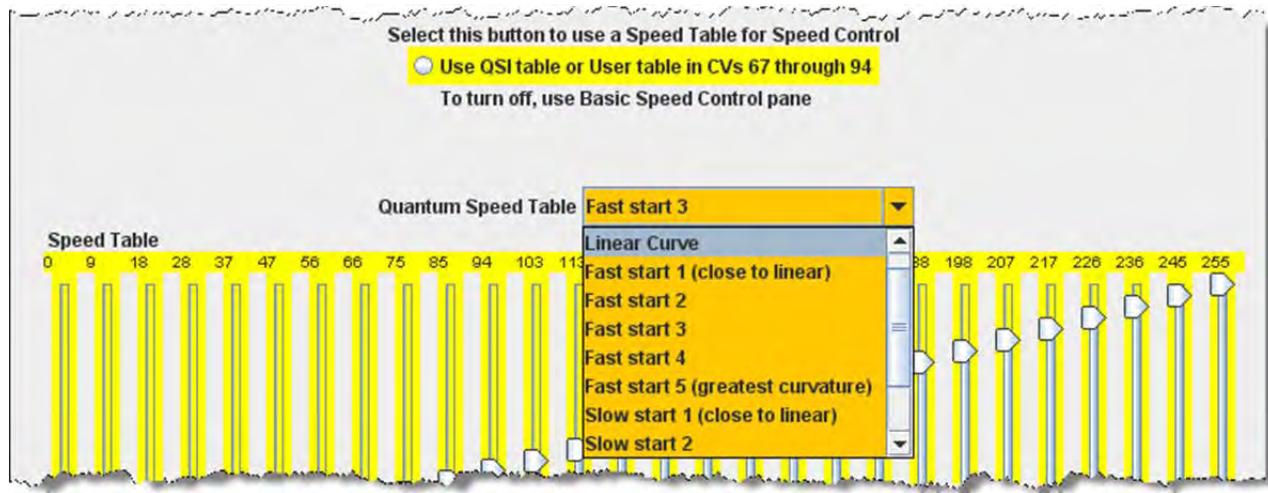
## CURVE SHIFTED RIGHT

Of course, you can enter the numbers individually or move the sliders one at a time to create your own fully customized speed table. To aid you with setting the individual values, the slider value is shown at the top of each slider. Also, by hovering the mouse at a slider column the number of the CV being entered will be revealed.

One very important thing to remember: **No matter how pretty your speed table looks, it has absolutely no effect on the locomotive unless you write it to the decoder!**

And this point is especially pertinent with the QSI and Soundtraxx Tsunami decoders, because they have a separate drop down box like the QSI box below. They require that you select the **user defined** speed table entry in this box

or your table will not be written to the decoder. Interestingly, Tsunami puts the selection at the bottom of the list making it very easy to miss.

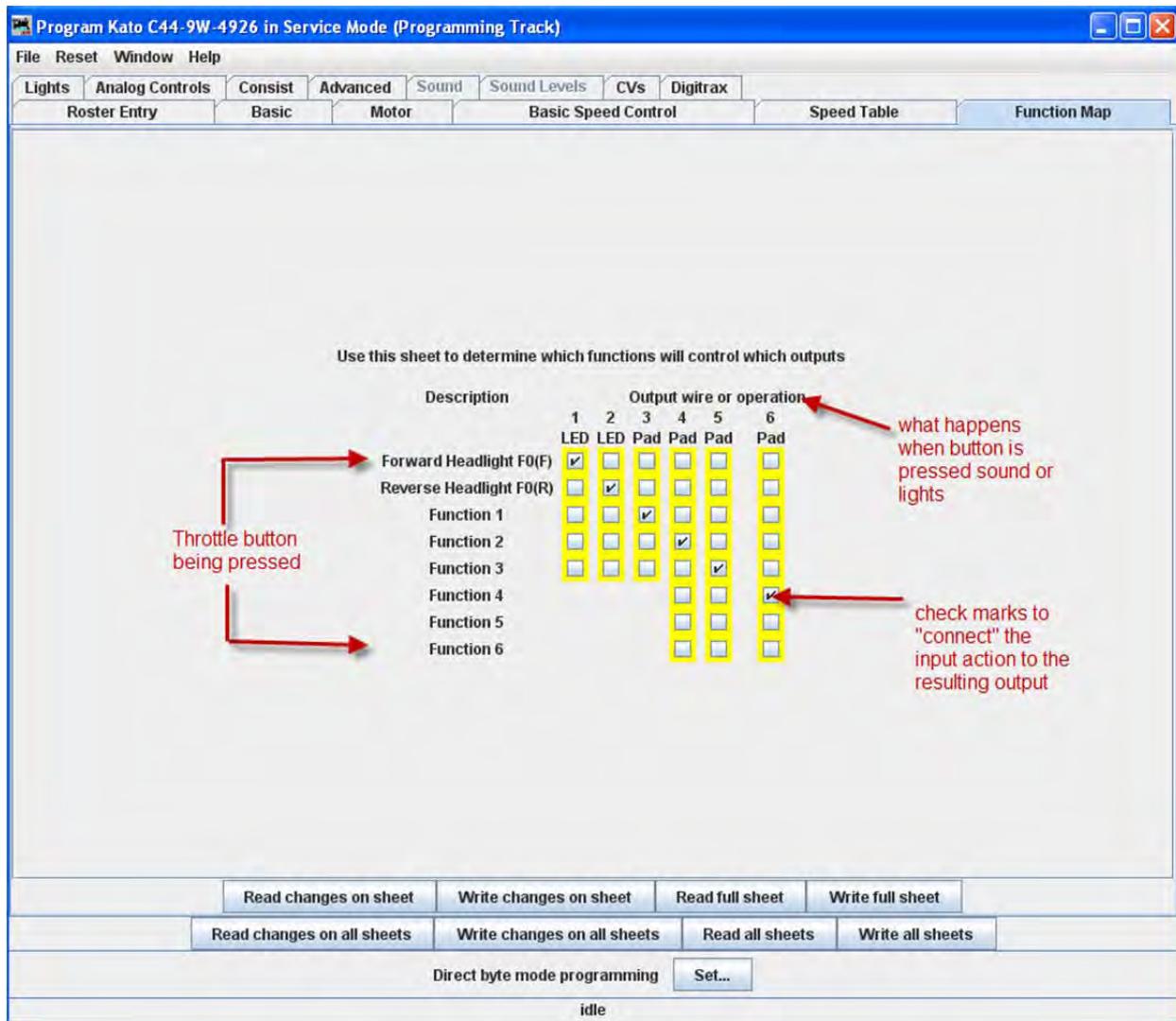


## FUNCTION MAPPING PANE

Some decoders allow you to change the function assigned to each set of output wires (or pads). Multiple choices for function assignments are shown by several check boxes. This is more common in decoders with more than four functions, and in sound decoders.

Some of the new sound decoders may have up to 28 functions, and your throttle may have a limited function capability. So, here's your opportunity to pick which ones you can operate from your throttle.

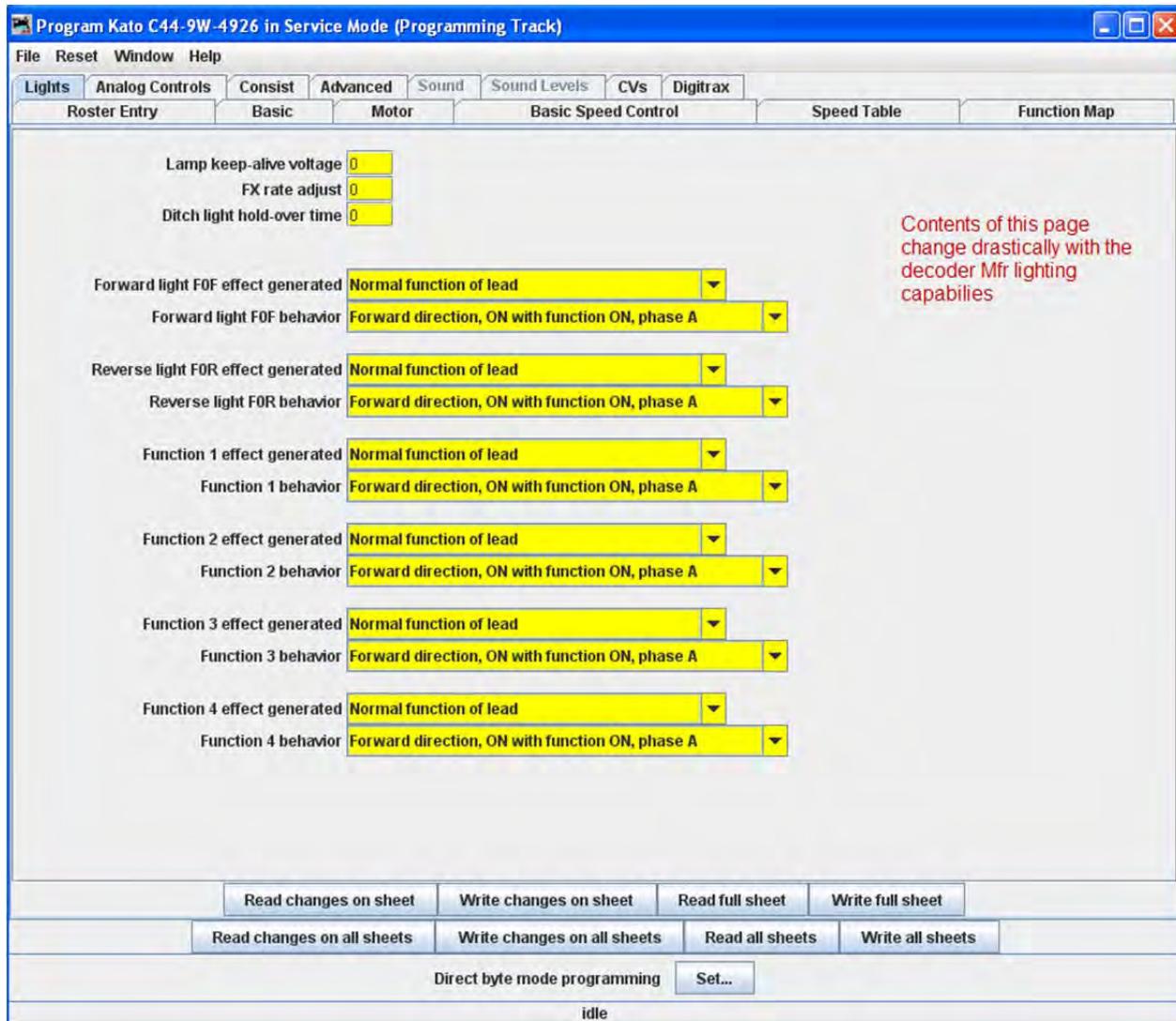
When this capability is present, the check boxes as shown in the window below are active and allow you to choose to which function key on the throttle each output responds.



If a checkbox is dimmed that indicates that no changes in function assignments are possible. Not all decoders allow you to remap the functions and others have very limited functions.

## LIGHTING AND FX FUNCTIONS PANE

This pane provides for control of some of the most "gee-whiz" functions on the decoder. While fine-tuning the motor is important, and speed tables help add to the realism of operation, everyone notices the lights - especially when they change intensity, flicker, flash, or fade. They attract even more attention when, for example, the ditch lights that were steadily shining as the locomotive approached the crossing suddenly begin flashing alternately, then return to a steady glow; or when a locomotive pulls into a siding, stops, and dims its headlight for the approaching train. All these effects are possible with the right decoder and proper set-up, and set-up is what DecoderPro is all about.



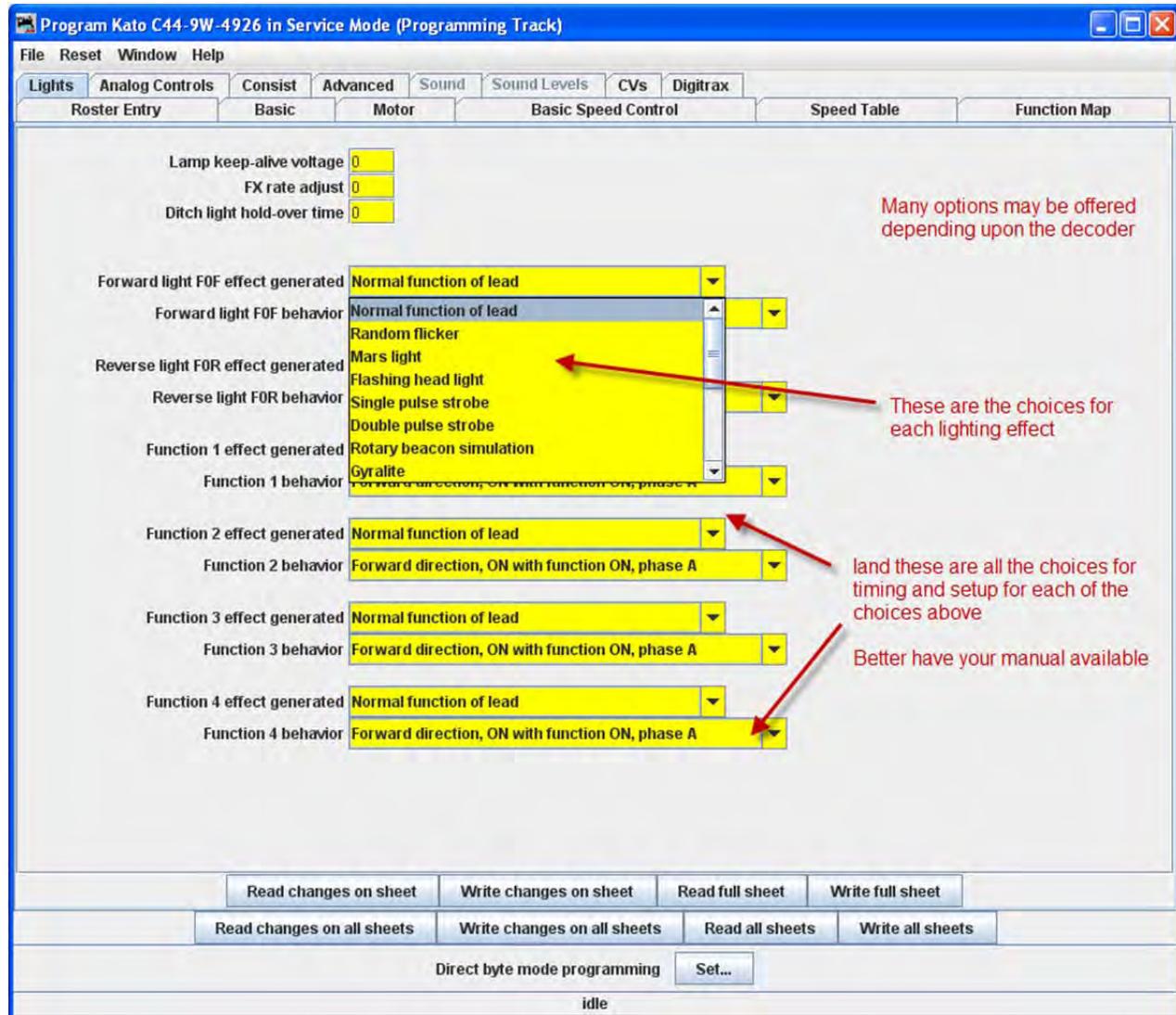
The specific effects available differ widely between manufacturers, and even between different "families" of decoders from the same maker. The above example is from a Digitrax FX decoder. Some of the advanced features you will see in many decoders (though they may go by different but similar names)

The **Lamp keep-alive voltage** determines how dark a light gets between "full on" moments. This can let you adjust effects to give the impression of, for example, a marker light that also has a rotary beacon in the same housing. Play with this value and see what kind of results you get for your specific decoder.

**FX rate adjust** controls how fast an FX effect operates. The higher the number, the slower the frequency of flash or "rotation" of the effect. This can be used to set subtle differences between locomotives. As you can see from the panel above, there are twin alternating strobe lights on the engines. If you vary the setting for the **FX Rate** slightly, the locomotives flash at slightly different rates. This keeps MU units from looking too coordinated!

**Ditch light hold-over time** CV establishes how long the ditch light effect (alternating flashing) stays activated after you hit the **F2** function key. Since the **F2** key is non-latching (think of it as a momentary contact switch) that

normally turns off when it is released. By raising the value of this CV you can make them stay on for up to 30 seconds from a single momentary activation.



The other lighting effects are highly variable between decoders. Check your specific decoder documentation for what the decoder is supposed to be capable of doing, and have fun playing with them. They are the most visually satisfying of all the capabilities of the decoders!

Even if the function and effect are available, you may have to add the lighting to your locomotive in order to be able to use that function, such as adding ditch lights, beacons, etc.

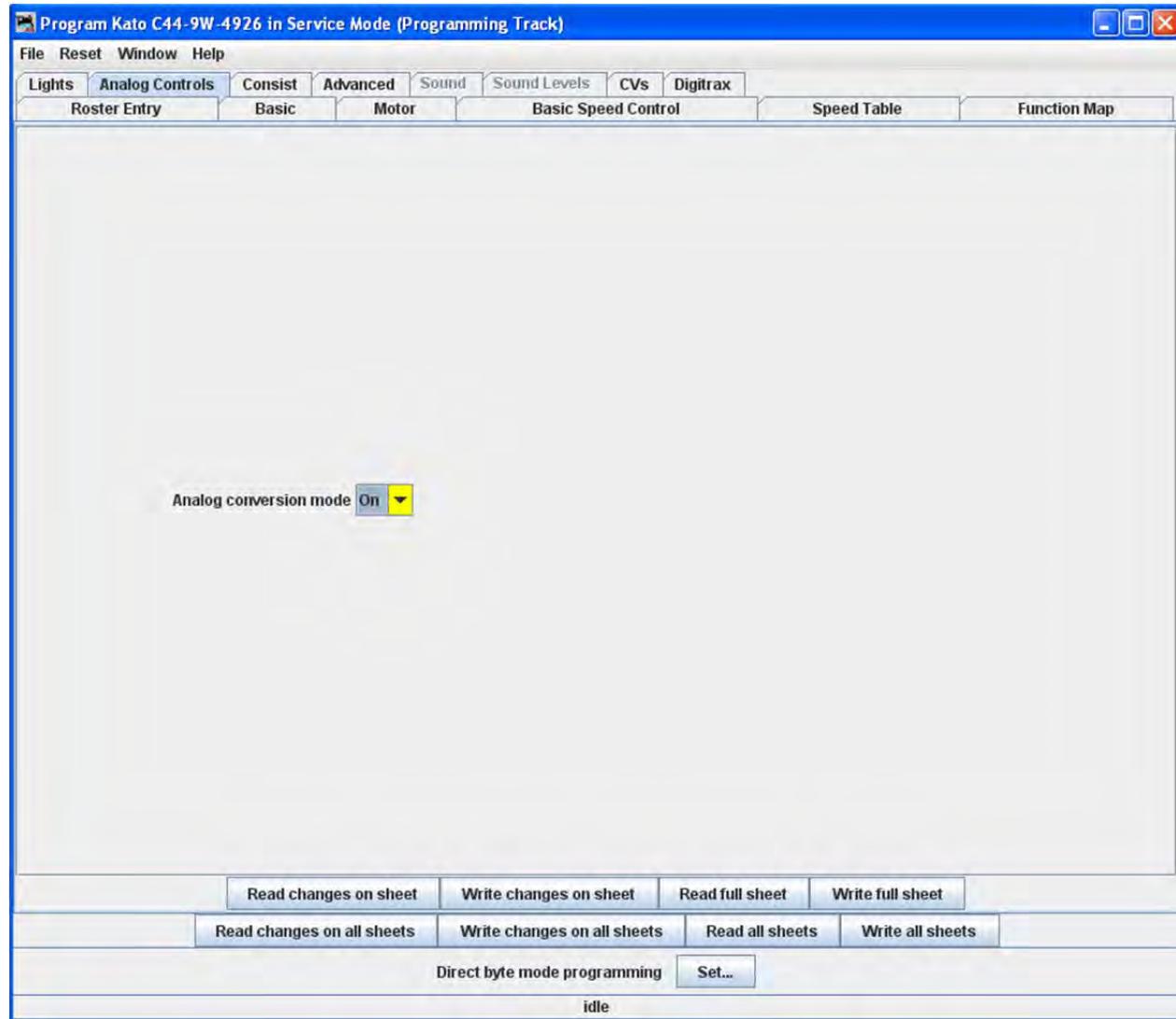
## ANALOG CONTROLS PANE

As discussed in the [Expanded Basic Pane](#), some decoders allow operation on Analog or Conventional DC layouts. At the discretion of the manufacturer, some of the non-motor responses may be changeable by setting CV's in the decoder. This pane is where you would set these values. Typical would be whether any of the various

# JMRI® User's Guide Version 2.12

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functions (such as lights and bell) would be on or off when in DC mode. Consult your decoders manual for options available.



## CONSISTING FUNCTIONS PANE

Consisting is a means to have two or more locomotives respond to orders from the command station, and do it together in unison. There are a number of terms used to describe consisting, and the manufacturers don't agree what those terms should be. The NMRA has adopted terminology, so that is what will be used in this discussion.

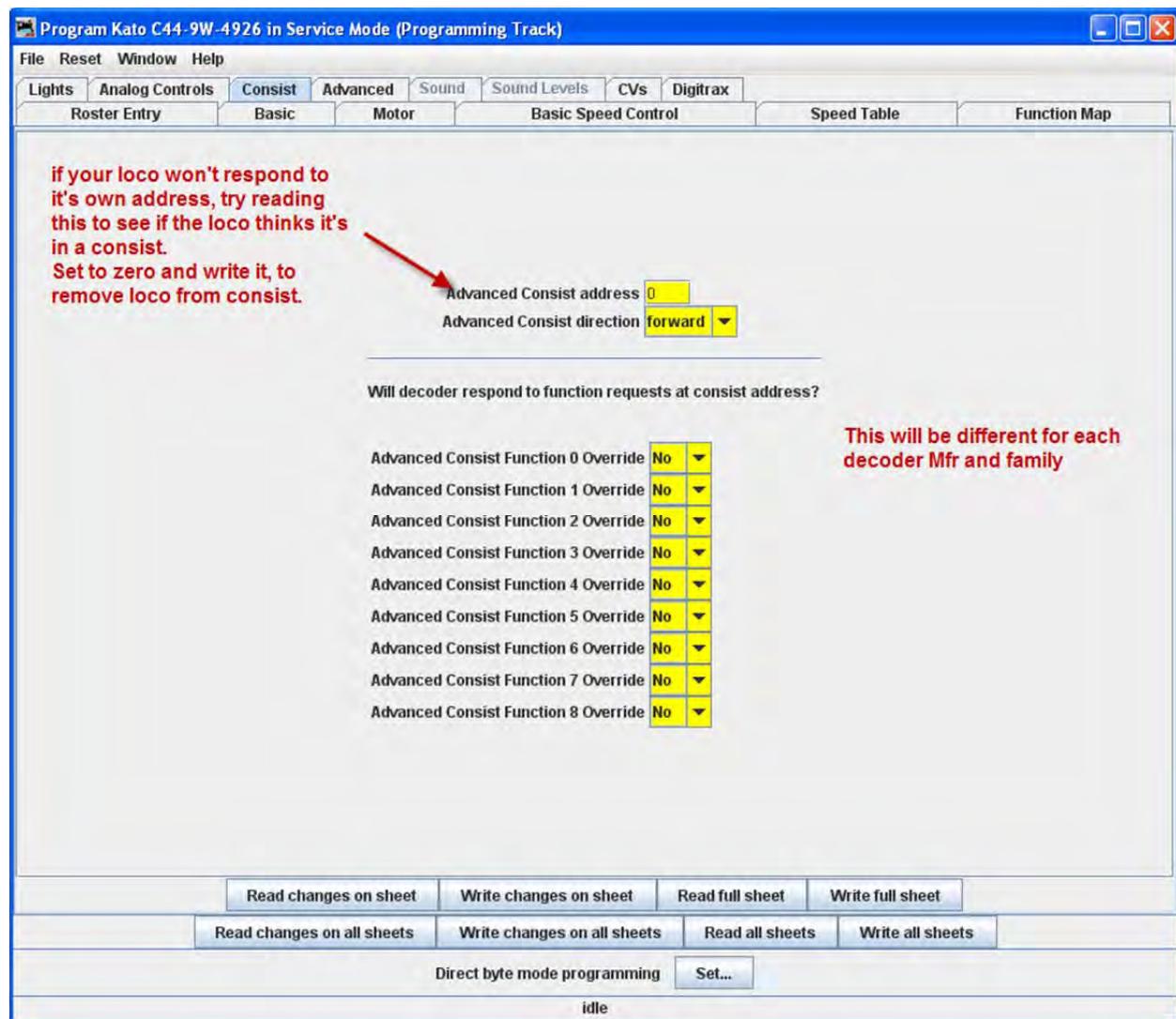
**Address Consisting.** You merely set the address of every locomotive to be the same, and we can use the Basic Programmer pane to do this. Then a DCC instruction sent to a locomotive with address XX will cause all the locomotives with address XX to respond. It works well for locomotives that are always run together, and is portable from one layout to the other. The disadvantage is that it's a pain to keep re-addressing your locomotives if you don't always run them together.

So, the NMRA came up with two additional means of consisting. One is set up in, and remembered by the command station, and the other is set in the decoders.

The NMRA calls the command station based system Basic Consisting. The command station keeps a list of all the locos in the consist. When an action is needed the command station sends an individual packet to every locomotive in the consist, which causes them to then act together. Since this method is command station based the consist is not portable to another system. Also, since it does not need to be programmed into the decoders, DecoderPro doesn't need to deal with it.

The NMRA calls the decoder based system Advanced Consisting. To implement this system the decoder has to have a special memory space (CV19) which is used to store a consist address. This type of consisting is portable between layouts, since the information that the loco is part of a consist, and the address information for that consist is carried in the decoder. The disadvantage is that once the locomotive is assigned to a consist it will only respond to the consist address. If you forget to "break" the consist at the end of an operation, you will be puzzled as to why your locomotive won't respond to requests for motion, even though it will respond to some of the lighting functions.

DecoderPro utilizes the Consisting Pane to set up NMRA Advanced Consists and the response of the locomotive to function requests sent to the consist address.



The Advanced Consist Address is for **EPF (Extended Packet Format)**, as defined by the NMRA Recommended Practices for DCC). If the consist address is **any value other than zero**, the locomotive is considered to be in a consist and will only respond to instructions sent to the consist address. Thus we set a short address here to create a multiple engine group that will all respond to the same address. Think of it as an MU specific locomotive address. Since the address is in the same range as non-consisted locomotives with short addresses, we need to be sure the address is unique on the layout. A way of doing this is to use higher end of the short address range starting from 127 and going down. Most folks working with single locomotives with short addresses tend to be using the manufacturer's default of 3, or other low values, typically for their logging locomotives.

This Pane also allows one to instruct the decoder what effects are to be active when the locomotive is in a consist, assuming the decoder is capable of responding appropriately. As an example, this allows you to specify if the headlights and other lighting functions are to be always off if the locomotive is in the middle, or tail end. This can be handy if only the "B" unit has sound. You can set it's lights to be off in a consist, but it can sound it's horn even though it's in the consist.

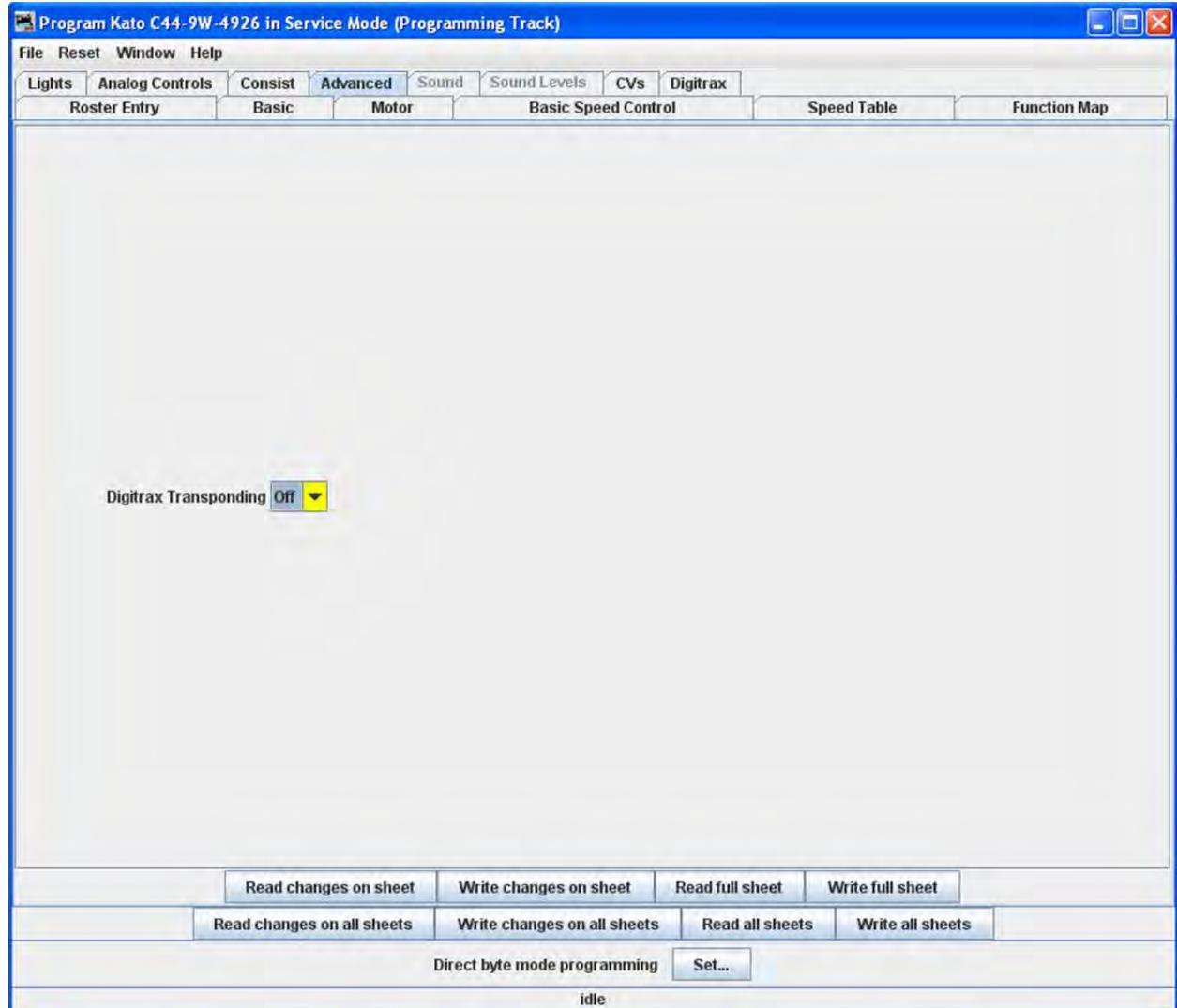
If you've had your locomotives on another layout and ran them together, but can't get them to run separately on your home system, check this to see if it's consist address has been set.

## ADVANCED FEATURES PANE

The **Advanced Features** pane covers CVs that don't fall readily into one of the other categories, and more importantly are not generally part of the NMRA DCC standard. This is a bit like the Netscape/Microsoft Browser Wars, areas where the manufacturer is pushing the envelope. In this case, the CV here controls the Transponding feature of newer Digitrax decoders, which allows them to report their location and engine number back to the Loconet.

There may be one or several of these panes, depending on how complex the decoder programming is and the style of the person who wrote the definition file for your particular decoder.

# JMRI® User's Guide Version 2.12

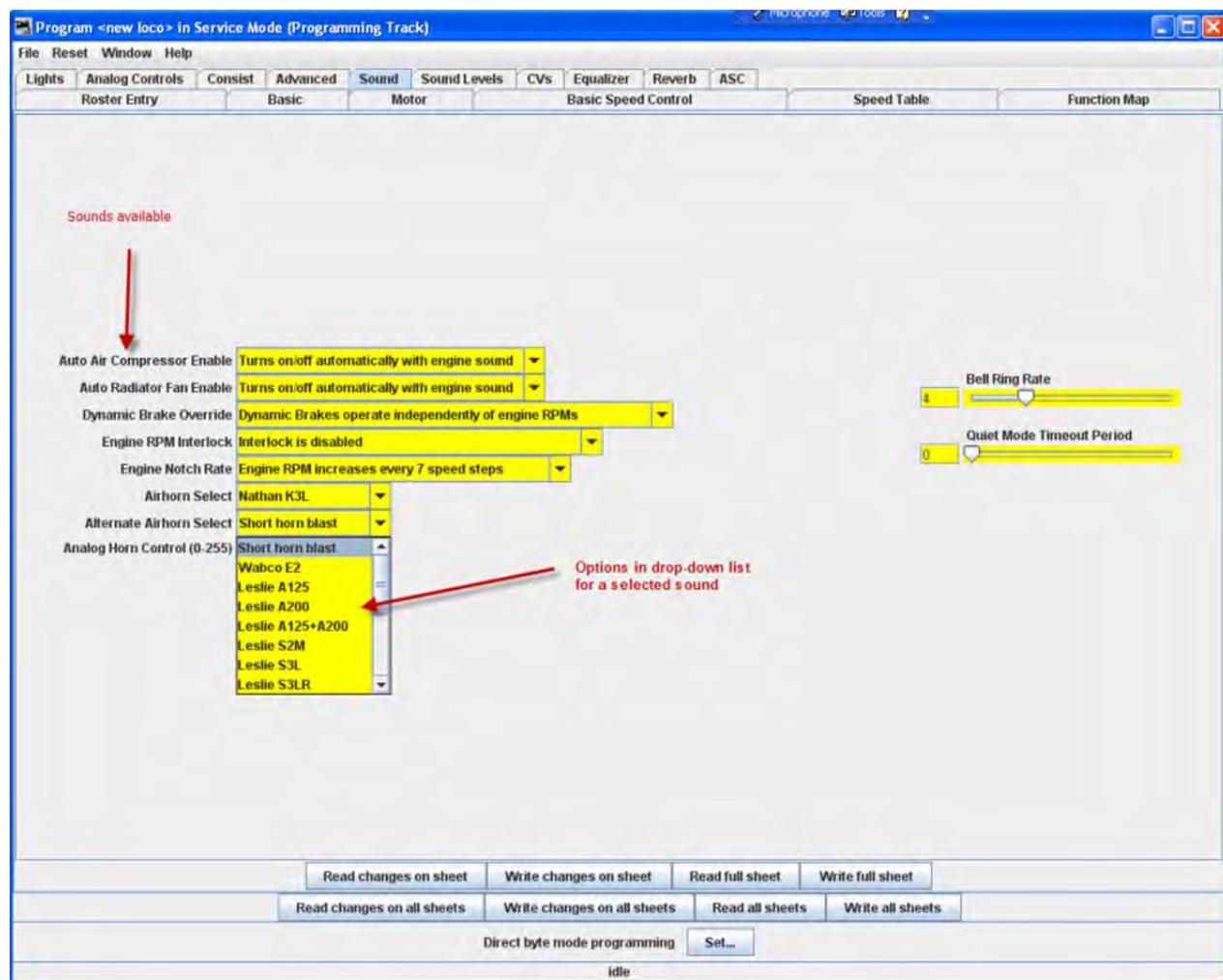


## SOUND FX PANE

Several manufacturers now offer decoders that include sound functions. This pane is designed to control those CVs. The screen shot below is from a programmer for SoundTraxx steam sound decoders. There are also diesel sound decoders available.

These sounds can be coordinated with the mechanism of the locomotive, and appropriate sounds can be triggered from the function keys of the throttle. Others can be set to be triggered at startup or to run in the background.

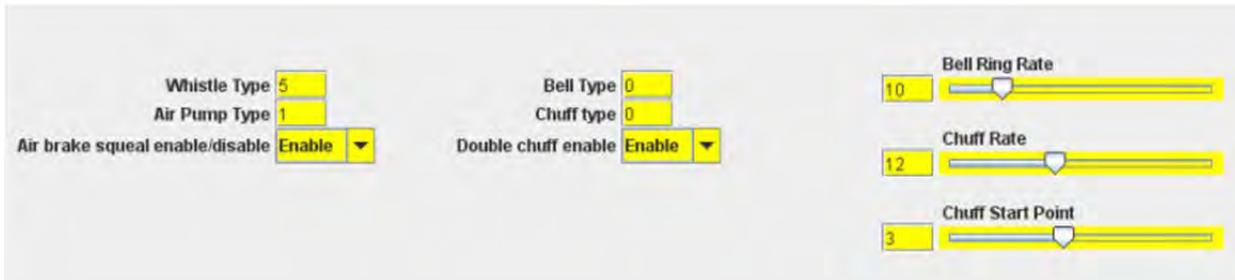
This pane allows for the selection of sound effects from sound decoders, and the [Sound Levels Pane](#) allows for setting the loudness levels of those sounds when they play back.



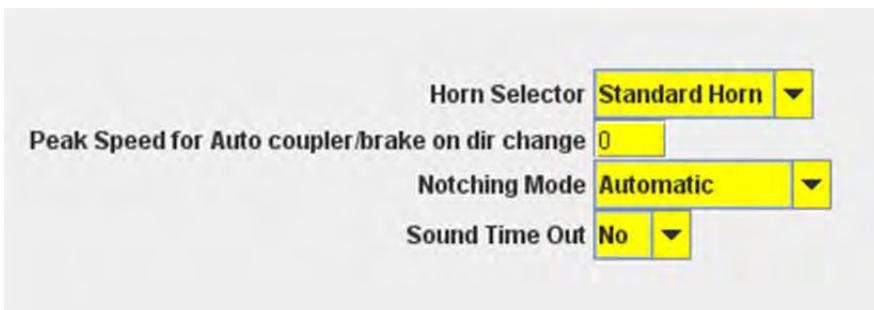
For specific function options, see your decoder documentation and the programmer for the specific decoder. Sometimes (depending on the volunteer that wrote the decoder definition file) there are “tool tips” that appear if you hover over a selection entry box.

Here are a sampling of sound functions on some other decoders:

## Athearn N Scale Big Boy and Challenger

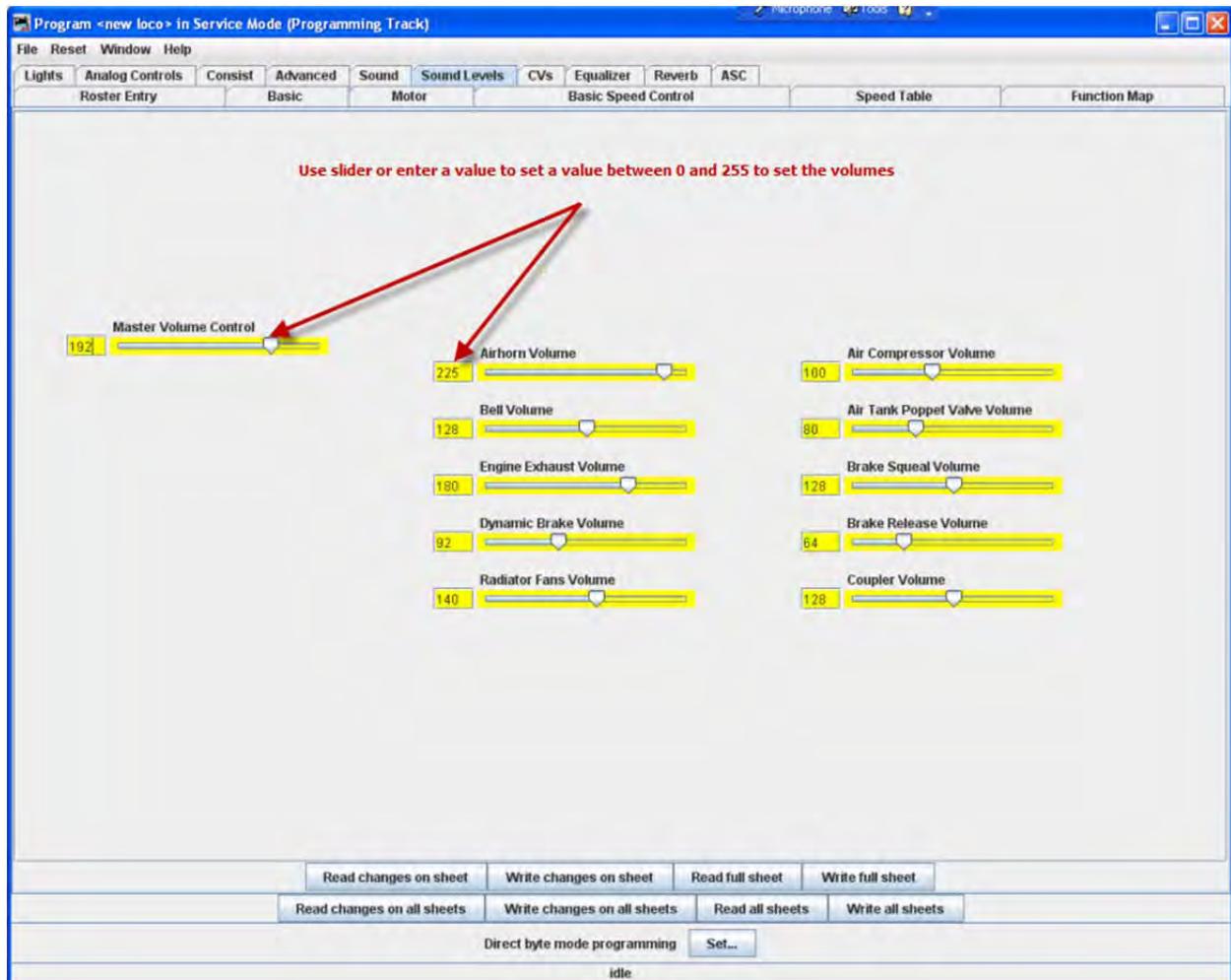


## Digitrax F40PH



## SOUND LEVELS PANE

Here are the controls for the relative volume levels and timing nuances of the sound decoder. Again, this is an example of one implementation. See your decoder documentation and the specific decoder programmer for details applicable to your equipment. Above all, don't be afraid to play with these settings and those in the [Sound](#) pane until you get sound you like. It's much easier to do here than it is to try to program these using a throttle! And even easier, if you are using the Ops Mode option to program the unit when it's running on the track. If you "write changes" after doing your selection change, you'll get instant feedback of how the sound has changed.



## GLOBAL CV LISTING PANE

For the hard-core programmer, this pane is a listing of the raw CV data by CV number, with data in decimal format. You may change data by typing new numbers into the **Values** window. **State** shows the validity of the data, whether it was taken **From file** (the decoder information saved in the **Roster**), **Edited**, **Read** directly from the decoder, **Stored** to the decoder or if the status is **Unknown**. Note the **scroll bar** on the right side of the listings. You may scroll up or down to access all of the CV listings.

### DECODER LOCKING

You tried to read a CV value and get “Error 308, No Acknowledgement from Decoder”, well the decoder may be locked. CV 15 and 16 deal with locking, if your manufacturer implements this feature (and manufacturers have slight differences as to how they implement it). If the decoder is locked, then you will not be able to read data from it or write to it. To unlock the decoder, you must enter a value into CV15 (the only CV that can be written when the decoder is locked), that is equal to the value that is currently in CV16. Now I hear you thinking “but I can’t read CV16 to know what to put into CV15”. Well, you’ll have to try all possible values, which isn’t that hard since it can only have 8 possible values 0 thru 7. After each write, try to read CV16. It’s the fastest read since it can only have 8 possible values. If JMRI responds with the no-ack error, then try the next value. If it returns the

value in CV16, you've unlocked the decoder and you're in. If you have unsuccessfully tried all the 8 possibilities, then check your layout connection and the loco's wheels for poor connections and try again. Now you say, "I've looked thru the list several times and CV 15 doesn't appear". That's on purpose, to minimize inadvertent locking by a Write All Sheets. You will have to use the [Single CV Programmer](#) to write CV15. It can be found in the Tools menu on the Main Page, under Programmers.

If you have more than one decoder in your locomotive, you probably have a decoder locking scheme implemented to be able to access each one individually for programming. There is a [Multi-decoder control](#) tool in JMRI. It is located on the main window under Tools menu, programmers option. It is accompanied with a comprehensive help describing its use.

You may **Read** or **Write** individual CVs using the buttons in their row. On this page, a **Read sheet** or **Write sheet** operation is the same as a **Read all** or **Write all**. Again, a reminder: you can only read CVs if your command station has that capability.

**CV Number**

**Value (in Decimal notation)**

**Results of clicking Compare**

**Yellow values are from the Roster file**

**Selected CV**

**Amber values have been edited by DecoderPro, but not yet written to the decoder**

**White values have been read from the decoder**

**State:**  
Same- means that the value in the decoder matched that in the Value column

If there is a difference, the value will turn red and State will show the value in the decoder

State will also show red if there is an error with any attempt to read or write a CV value

CVs 7 and 8 are the Manufacturers ID number and Version number. They are automatically read from the decoder and cannot be changed.

Number	Value (Deci...)	State	Read	Write	Compare
1	0	Unknown	Read	Write	Com...
2	0	Unknown	Read	Write	Com...
3	0	Unknown	Read	Write	Com...
4	0	Unknown	Read	Write	Com...
5	0	From file	Read	Write	Com...
6	0	From file	Read	Write	Com...
7	51	From file	Read	Write	Com...
8	129	From file	Read	Write	Com...
9	0	From file	Read	Write	Com...
17	194	Edited	Read	Write	Com...
18	100	Edited	Read	Write	Com...
19	0	From file	Read	Write	Com...
21	0	From file	Read	Write	Com...
22	0	From file	Read	Write	Com...
29	54	From file	Read	Write	Com...
40	0	From file	Read	Write	Com...

Read changes on sheet   Write changes on sheet   Compare changes on sheet   Read full sheet   Write full sheet   Compare full sheet

Read changes on all sheets   Write changes on all sheets   Read all sheets   Write all sheets

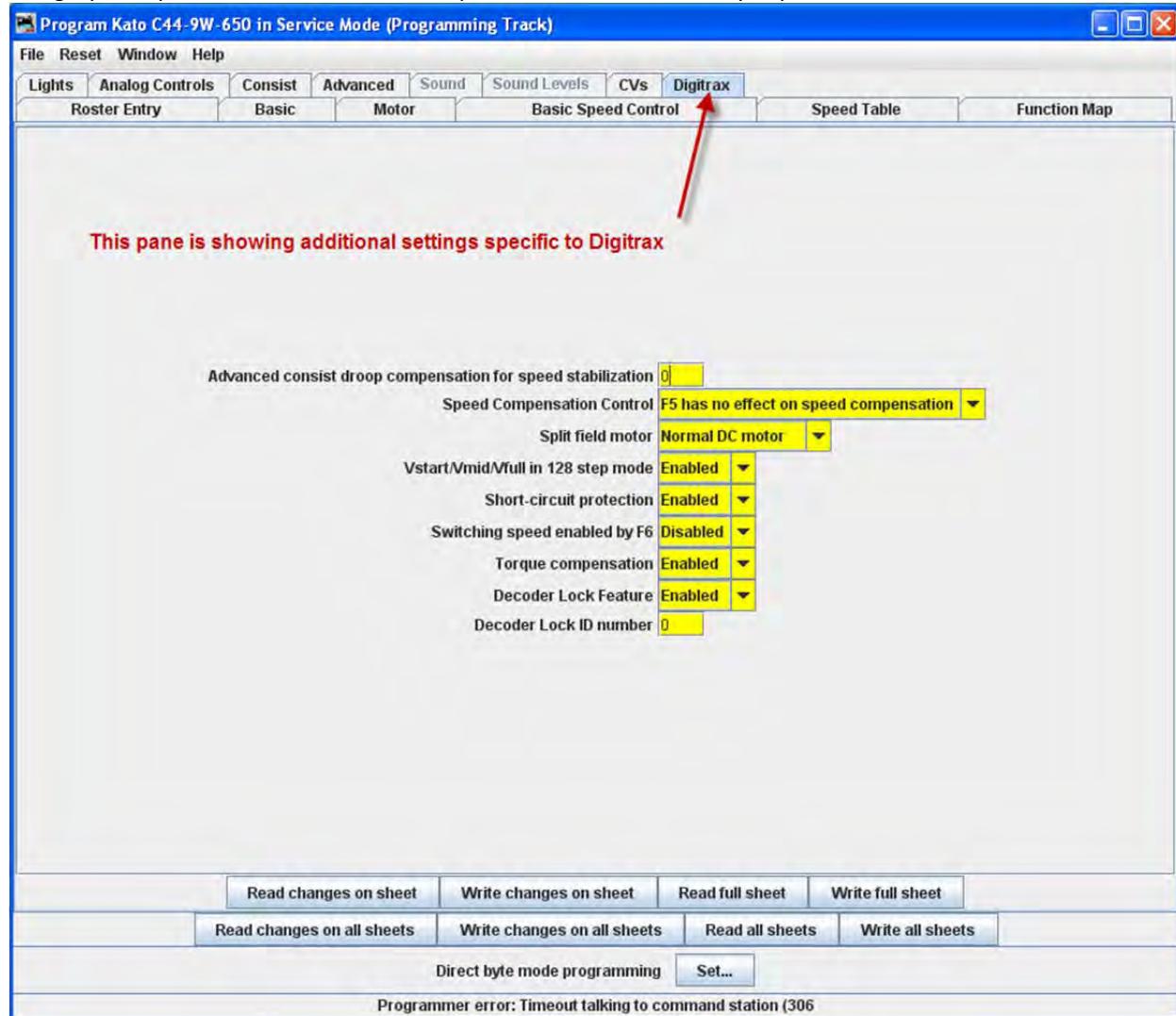
Direct byte mode programming   Set...

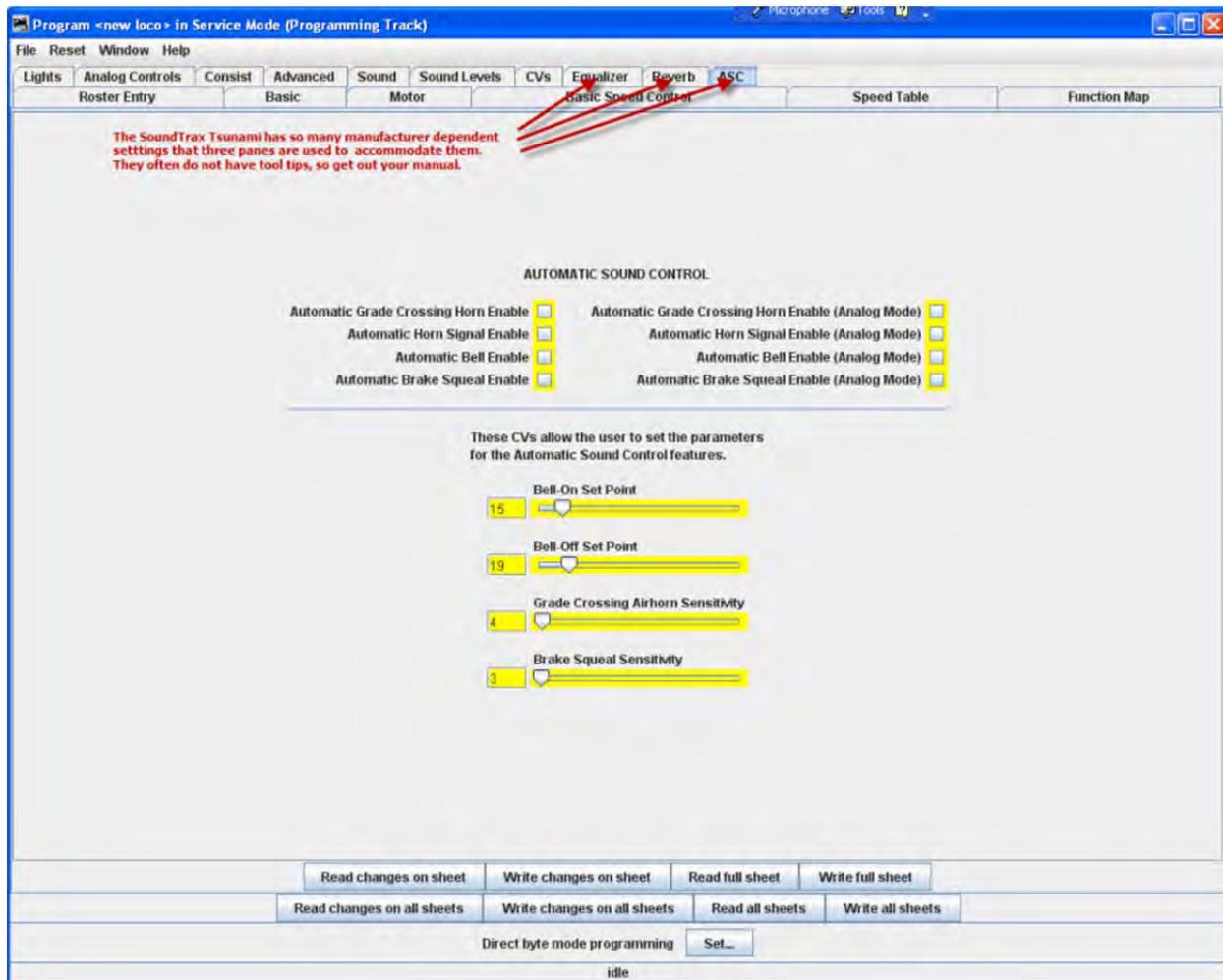
Programmer error: Timeout talking to command station (306)

One thing to keep in mind about the **CV** listing on this pane - anything you can do here you can do from one of the other panes in Decoder Pro, without having to know the **CV** number or how to compile the values to get the desired effect. This pane is meant for advanced users of DCC used to crunching the numbers themselves. Those new to DCC can safely ignore this panel without losing any capability at all.

## MANUFACTURER SPECIFIC DATA PANE

This pane in the **Comprehensive Programmer** provides programming for functions that are specific to an individual manufacturer, but outside the realm of the DCC standard. While items like **Transponding** may eventually find a place in the NMRA DCC standard, and are therefore in the Advanced pane, these items are obviously beyond that category. This pane will be manufacturer dependent and decoder family dependent





These items will, by definition, vary greatly between manufacturers. Once again, your best resource is the documentation for the specific decoder you are programming and this pane in the programmer for that decoder.

## PRINTING DECODER DATA

**Print Data:** DecoderPro provides the capability to print out a full list of the decoder CV data or selected data. To print, select the **File** menu of any Comprehensive Programmer Pane, then select the Print or Print Preview options.

- Print all..., Preview all... Displays Select Items to Print dialog box



Select each or all of the decoder items that you want to print

Click to print then Print dialog for your computer system is displayed.

- Print CVs...,Preview CVs...Displays **Select Items to Print** Dialog box or Preview screen

These printouts show the variables by name in each category that is selected.(as shown on the DecoderPro panes) along with their CV number and Value. A handy reference for the future.

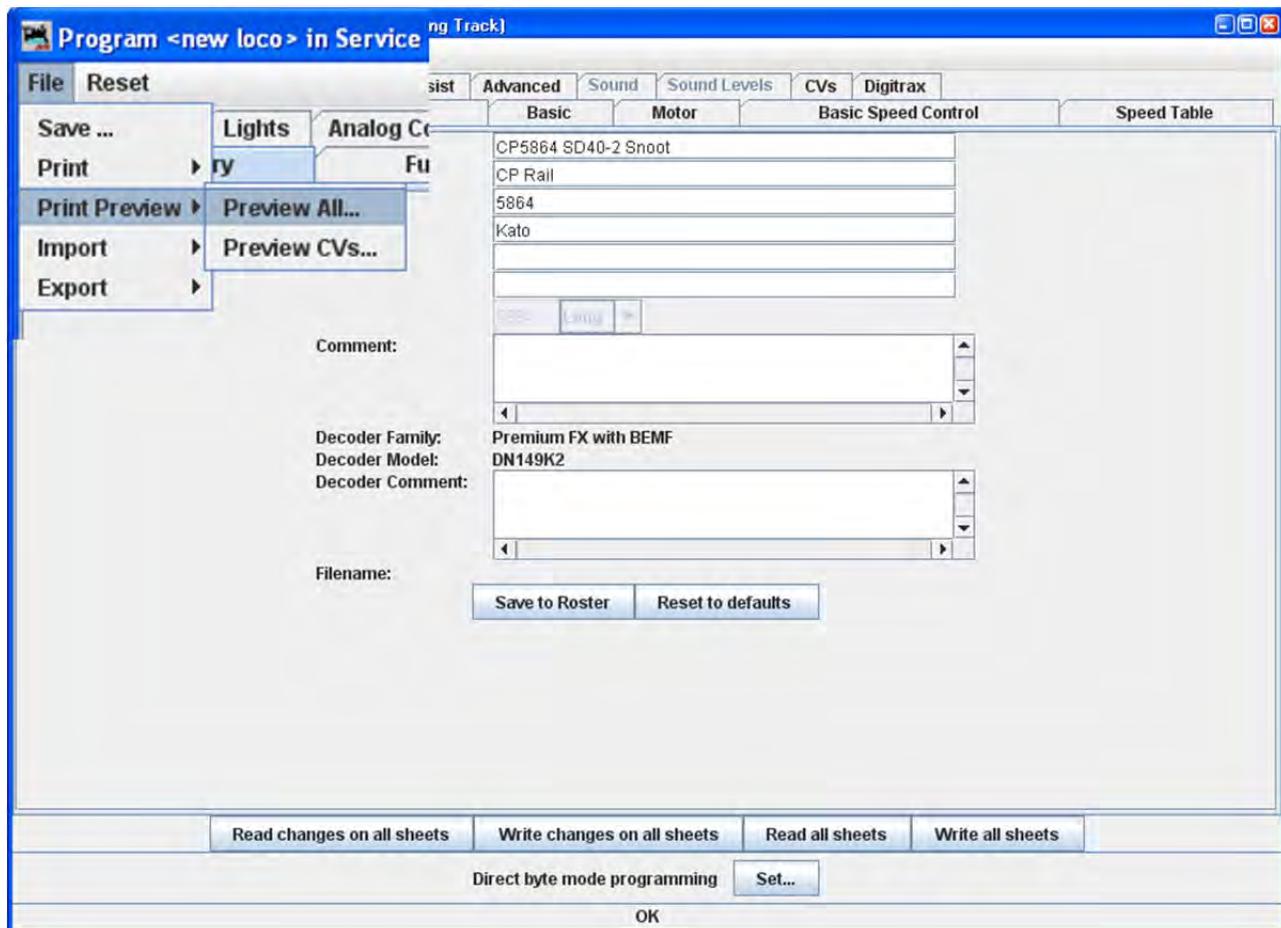
Print preview will look like it's about to print the list, and ask for which printer to use. Don't panic!, that's only to get the preview to work. Go ahead and select the printer and you'll only get the preview.

**Import Data:** You may import the list from another computer in the PR1 file format. Thus, the Export and Import capability allows you to take the data from one computer system to another.

**Export Data:** you may export the list as one of several file types :

- CSV file... (Comma separated variables)
- PR1DOS file...
- PR1WIN file...

All are two columns, CV#, and Value)



The three images below are samples of the "All" printout from the SD40-2 that has been used as an example in many places in this manual. Click on the page to see a larger image in a new window.

# JMRI® User's Guide Version 2.12

CP9864 SD40-2 Shoot -1- December 26, 2003 12:50 PM

**Decoder**

File name: CP9864\_SD40-2Shoot.xls  
 File type: CP Rail  
 Board number: 5004  
 Manufacturer: Rete  
 Model: SD40-2 Shoot  
 Board Address: 10000000  
 Comment: MF Equipped, Power  
 Decoder Model: DE5482  
 Decoder Family: Premium FX with 100W

Field	Setting
Addressing Mode	1 digit addressing
Primary Address	1
Long Address	3044
Motor direction of motion	Forward
Motor speed	20/128
Analog conversion mode	On
User Private ID #1	0
User Private ID #2	0
Manufacturer ID	0
Version ID	0

Field	Setting
Kid Start	0
Acceleration Rate	0
Deceleration Rate	0
Static compensation for speed	128
Stabilization	0
Dynamic compensation for speed	60
Stabilization	0
Scale operation drop compensation	4
for speed stabilization	0

Field	Setting
Start Speed Table	One Start, Valid, High
Start Volts	0
Mid Volts	0
Max Volts	0
Forward Trim	0
Reverse Trim	0
Speed Table	0,3,15,27,39,45,54,63,75,81,91,105,115,127,135,145,154,163,173,182,191,200,209,215,227,236,240

CP9864 SD40-2 Shoot -2- December 26, 2003 12:50 PM

**FUNCTION MAP**

Field	Setting
P1 controls output 1	0
P1 controls output 2	0
P1 controls output 3	0
P2 controls output 4	0

**LIGHTS**

Field	Setting
Directional Headlights	Normal headlight operation
Same keep-alive voltage	0
VIS rate attack	0
Driver light hold-over time	0
Forward light FTF effect generated	Normal function of lead
Forward light FTF behavior	Forward direction, OM with function OM, phase A
Reverse light FTF effect generated	Normal function of lead
Reverse light FTF behavior	Forward direction, OM with function OM, phase A
Function 1 effect generated	Normal function of lead
Function 1 behavior	Forward direction, OM with function OM, phase A
Function 2 effect generated	Normal function of lead
Function 2 behavior	Forward direction, OM with function OM, phase A

**CVS**

Field	Setting							
CV	Dec Hex	Value	CV	Dec Hex	Value	CV	Dec Hex	Value
1	3 03	50	0 00	70	27 18	84	154 9A	
2	0 00	51	0 00	71	36 24	85	163 A3	
3	0 00	52	0 00	72	45 2D	86	173 AD	
4	0 00	55	12 80	73	54 3E	87	182 8E	
5	0 00	56	48 30	74	63 3F	88	191 8F	
6	0 00	57	6 06	75	72 48	89	200 C8	
7	0 00	61	0 00	76	81 51	90	209 D1	
8	0 00	62	0 00	77	91 5B	91	218 DA	
13	0 00	63	0 00	78	100 64	92	227 E3	
17	207 CF	65	0 00	79	109 69	93	234 EC	
18	2 18	66	0 00	80	118 76	94	245 F5	
19	0 00	67	0 00	81	127 8F	95	0 00	
29	38 26	68	9 09	82	136 8B	105	0 00	
49	0 00	69	18 12	83	145 91	116	0 00	

**DIGITALS**

Field	Setting
Advanced consist drop	0
Speed compensation for speed	0
Stabilization	0
Speed Compensation Control	FS has no effect on speed compensation
Split field motor	Normal; DC motor
Vstart/Vmid/Vfull in 128 step mode	Enabled
Short-circuit protection	Enabled

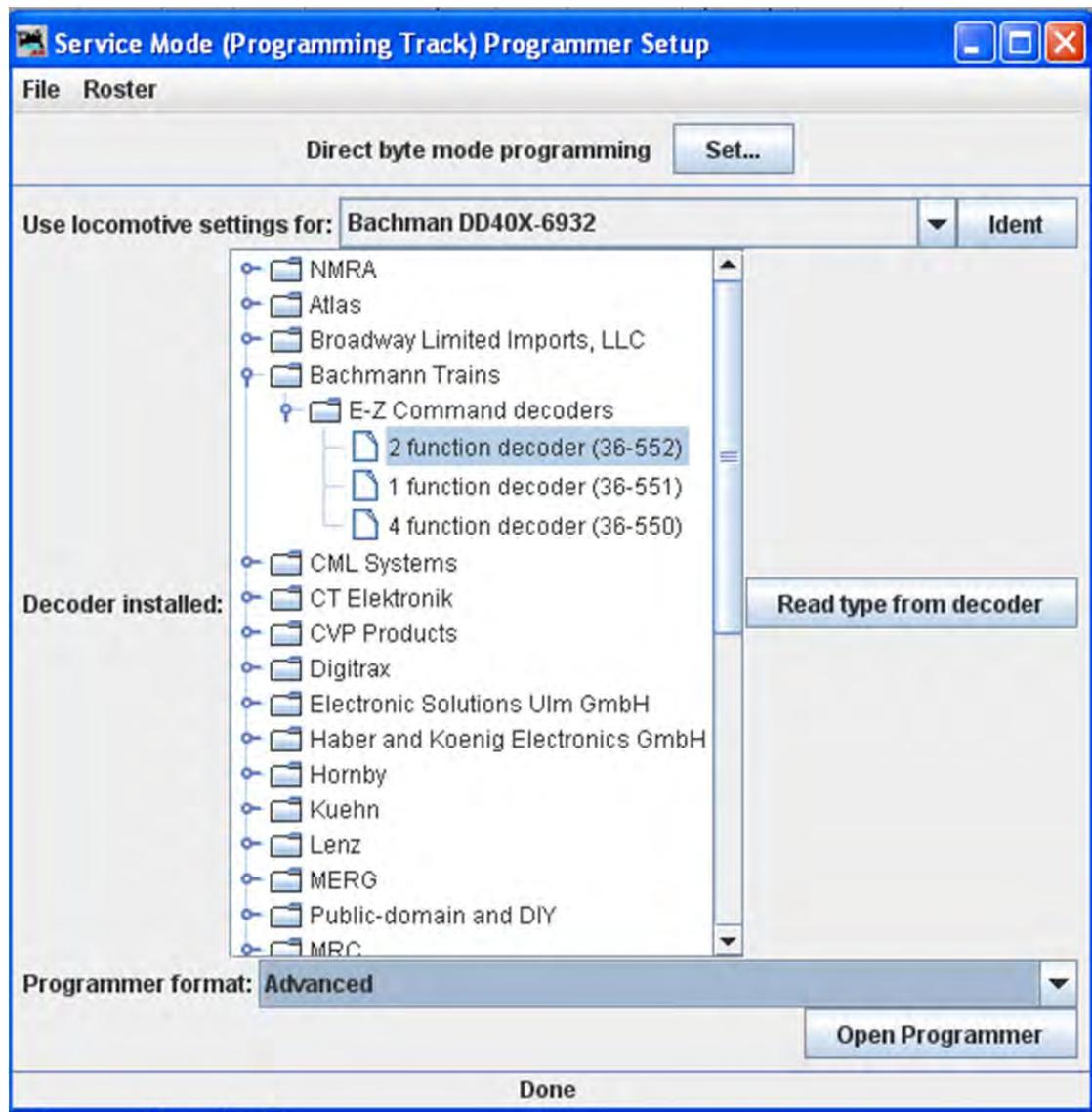
OK! That's it! You now know how to use DecoderPro to program your decoders. Now let's run trains!



## CHAPTER 7 - ADVANCED PROGRAMMER

### ROSTER ENTRY

From the main DecoderPro window, select whether you want Service or Operations Mode programming. For this demonstration we have chosen **Service Mode (programming track) Programmer**. When the Service Mode Programmer starts the Setup window opens. This section will only cover new items that are enabled by the Advanced Programmer, refer to [Comprehensive Programmer](#) for all other tabs.



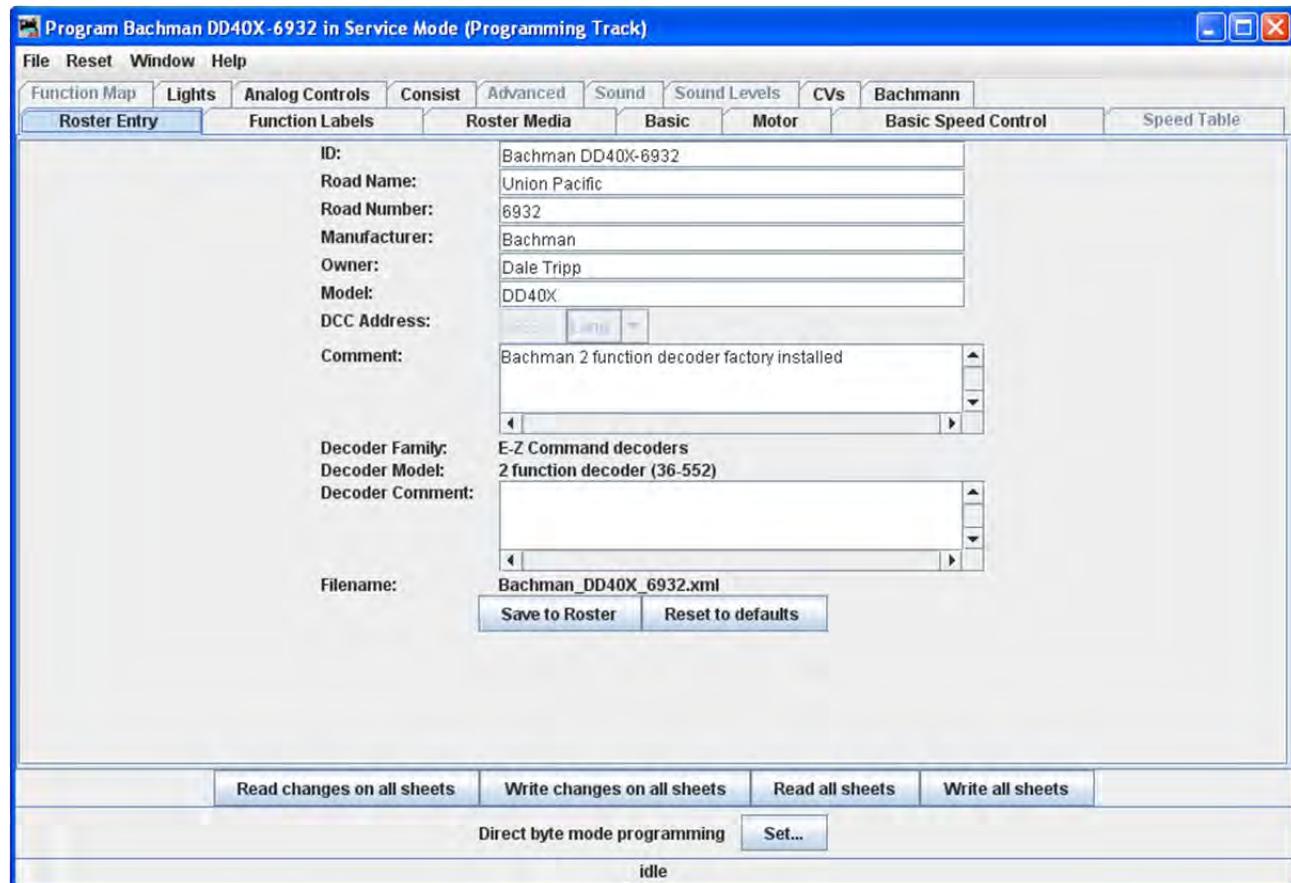
In the **Programmer format** drop-down box at the bottom of the window select the **Advanced** programmer. If you wish for the Advanced programmer to be your default for all future DecoderPro sessions you may set this up by editing your [Preferences](#) in the main DecoderPro window.

# JMRI® User's Guide Version 2.12

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Next, Select the decoder you wish to program, if you have not already done so. This is done just as you would in the [Comprehensive programmer](#).

Now click on the Open Programmer button to get to the Advanced Programmer Screen.



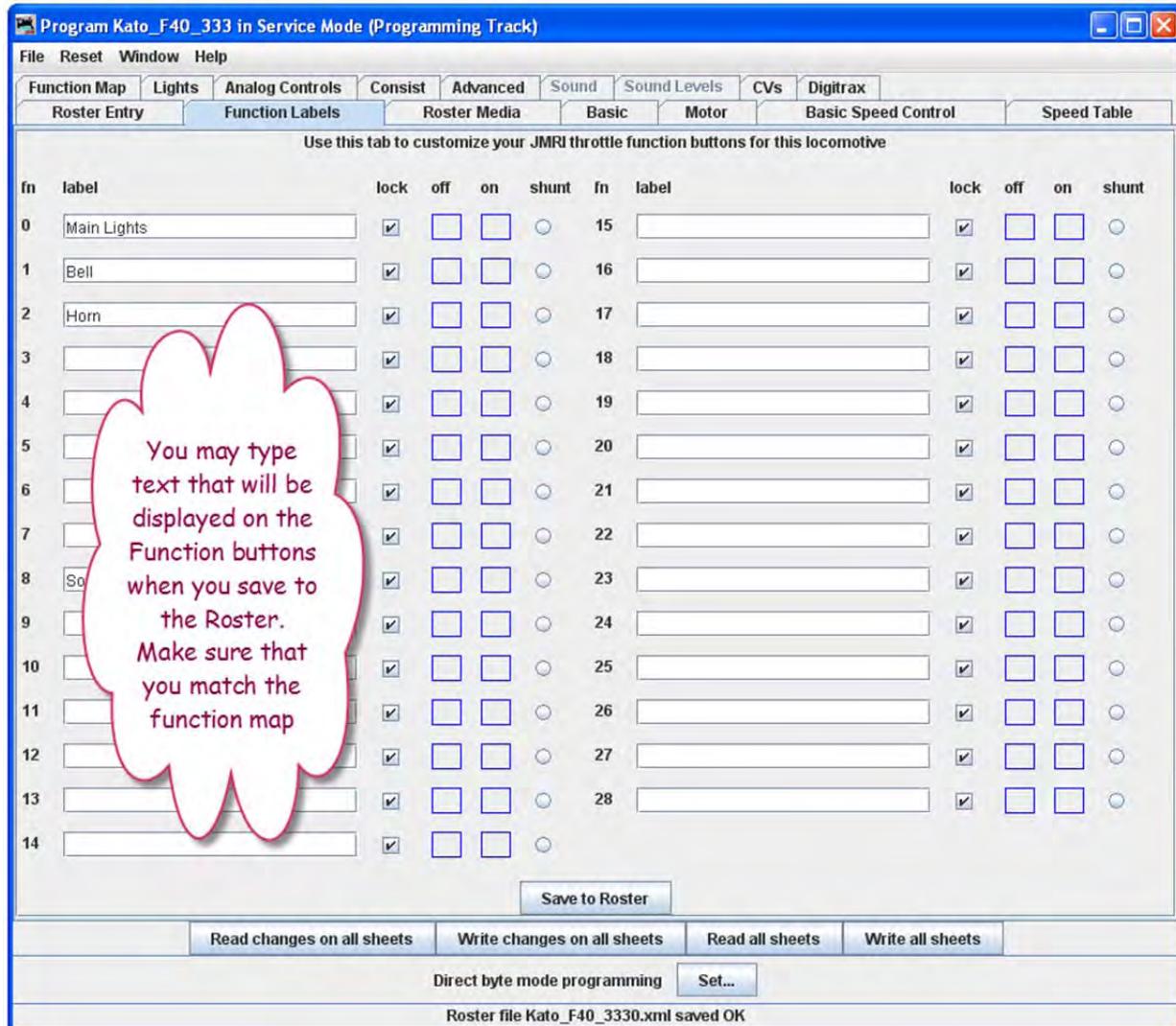
Note the Advanced Programmer has two new TABS, **Function Labels** and **Roster Media**, all other TABS are the same as those available (depending upon decoder) in Comprehensive programmer.

## FUNCTION LABELS PANE

This pane is more than a scratch pad to keep track of what happens when function buttons are pushed. It also interacts with the [JMRI throttle](#).

The **Function Label** Tab makes settings for the Software Throttles within JMRI. Primarily the on-screen throttles, but some of the settings are mirrored on smart-phones (iPhone/Android) using the WiThrottle interface.

When you use the roster pull-down on the JMRI throttle to select a loco from your roster, the function buttons will be marked with the descriptions you have entered for those functions in this pane.



Using the checkboxes, space holders and the radio button to the right of each function may be set to:

<b>lock</b>	Makes the function button "latching" or "non-latching". When the box is checked the function is "locked" or "latched".  <b>Latched Function</b> when pressed will stay on(down position) until pressed again i.e. Function button labeled "Bell" would ring until pressed again.  <b>Unlatched Function</b> when pressed toggles on and then off. i.e. Function Button labeled "short horn", when pressed provides one blast of horn.
<b>off</b>	Place holder for icon that is displayed on Function Button when it is in off state.
<b>on</b>	Place holder for icon that is displayed on Function Button when it is in on state.

shunt	Sets "virtual" function key for software throttle. The "lock" option also needs to be set simultaneously with the "shunt" virtual function key activation. When this Function key is pressed the throttle speed slider on the software throttle changes to "center off" style for shunting, rather than the "full-range with separate direction key"
-------	--

You may drag and drop icons into the off or on space holder here or in the Throttle Function pane properties.

You may also edit the function button text in the [JMRI Throttle](#) and save those changes to the selected Roster entry. To use these changed entries in the future, make sure you click on the **Save to Roster** to save these values into the Roster entry that is in use.

## ROSTER MEDIA PANE

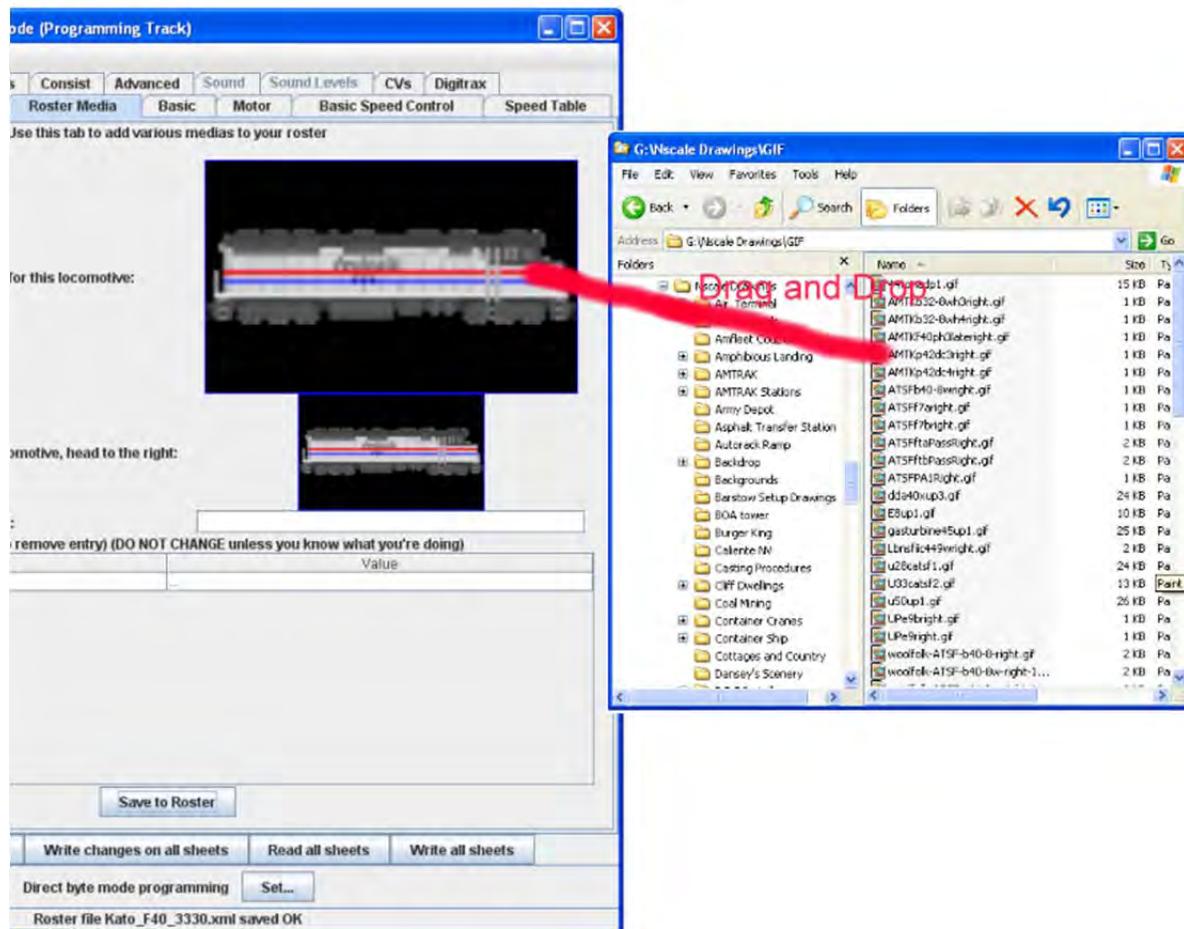
The Roster Media Pane allows you to add a main image and an icon to the engines roster. The main image may be used for Throttle background image if selected in the Throttle preferences. The icon image is used in the Throttle list and various roster combo boxes.



**Image to be used as main image for that roster:** The large black box is the image holder. The image is placed into the image holder by following these instructions.

1. First you must find the image of the Locomotive and store it on your disk drive.
  - a. Sources
    1. Images downloaded from a website to your computer
    2. Photos taken with a digital camera or scanned from film
    3. Other sources, CD, DVD frames from videos etc. saved as an image to your computer
  - b. Format
    1. The GIF format is preferred with transparent background
    2. PNG with transparent background
    3. JPG
2. After storing image on your computer open the Roster Media Pane, then open Windows Explorer or File Manager for your system and drag and drop the image file into the large black box. You may also save the image to your Desktop and drag and drop to Roster Media from there. DO NOT try to drag and drop from a website.

Roster images are stored in the <JMRI Preferences folder>/resources. When an image is updated or removed it is not removed from this folder.



To remove either image from the Roster, Right click and click remove in the context that displays, however, it will not remove the image from the Resources folder.

**Image to be used as icon for that roster, head to the right:** similarly, there is a small black box which can be filled with a picture to be used as an icon for roster entry identification. The instructions are the also similar:

1. Next you must find the image of the Locomotive to use as an icon and store it on your disk drive.
  - a. Sources
    1. Images downloaded from a website to your computer
    2. Photos taken with a digital camera or scanned from film
    3. Other sources, CD, DVD frames from videos etc. saved as an image to your computer
  - b. Format
    1. The GIF format is preferred
    2. PNG with transparent background
    3. Do not use JPG.
2. After storing icon image on your computer open the Roster Media Pane, the open Windows Explorer or File Manager for your system and drag and drop the image file into the small black box. You may also save the image to your Desktop and drag and drop to Roster Media from there. DO NOT try to drag and drop from a website.

To remove either image from the Roster, Right click and click remove in the context that displays, however, it will not remove the image from the Resources folder.

**Web reference:** You can copy the URL of the website where you located the images for reference

After adding images to the image boxes for main image and icon, click on this button to store images in your Roster.

**Links for icons in GIF and images of most Locomotives are listed below:**

[Central California Rails](http://cencalrails.railfan.net/home.shtml) <http://cencalrails.railfan.net/home.shtml>

[Rail Serve](http://www.railserve.com/TrainGI) <http://www.railserve.com/TrainGI>

[Train GIF Railyard](http://www.djcooley.com/info/gifs/loco/gifloco.htm) <http://www.djcooley.com/info/gifs/loco/gifloco.htm>

## EXPANDED BASIC PANE

See Pane in Comprehensive Programmer.

## MOTOR CONTROL PANE

See Pane in Comprehensive Programmer.

## SPEED CONTROL PANE

See Pane in Comprehensive Programmer.

## THE SPEED TABLE PANE

See Pane in Comprehensive Programmer.

## FUNCTION MAPPING PANE

See Pane in Comprehensive Programmer.

## LIGHTING AND FX FUNCTIONS PANE

See Pane in Comprehensive Programmer.

## ANALOG CONTROLS PANE

See Pane in Comprehensive Programmer.

## CONSISTING FUNCTIONS PANE

See Pane in Comprehensive Programmer.

## ADVANCED FEATURES PANE

See Pane in Comprehensive Programmer.

## SOUND FX PANE

See Pane in Comprehensive Programmer.

## SOUND LEVELS PANE

See Pane in Comprehensive Programmer.

## GLOBAL CV LISTING PANE

See Pane in Comprehensive Programmer.

## MANUFACTURER SPECIFIC DATA PANE

See Pane in Comprehensive Programmer.

## PRINTING DECODER DATA

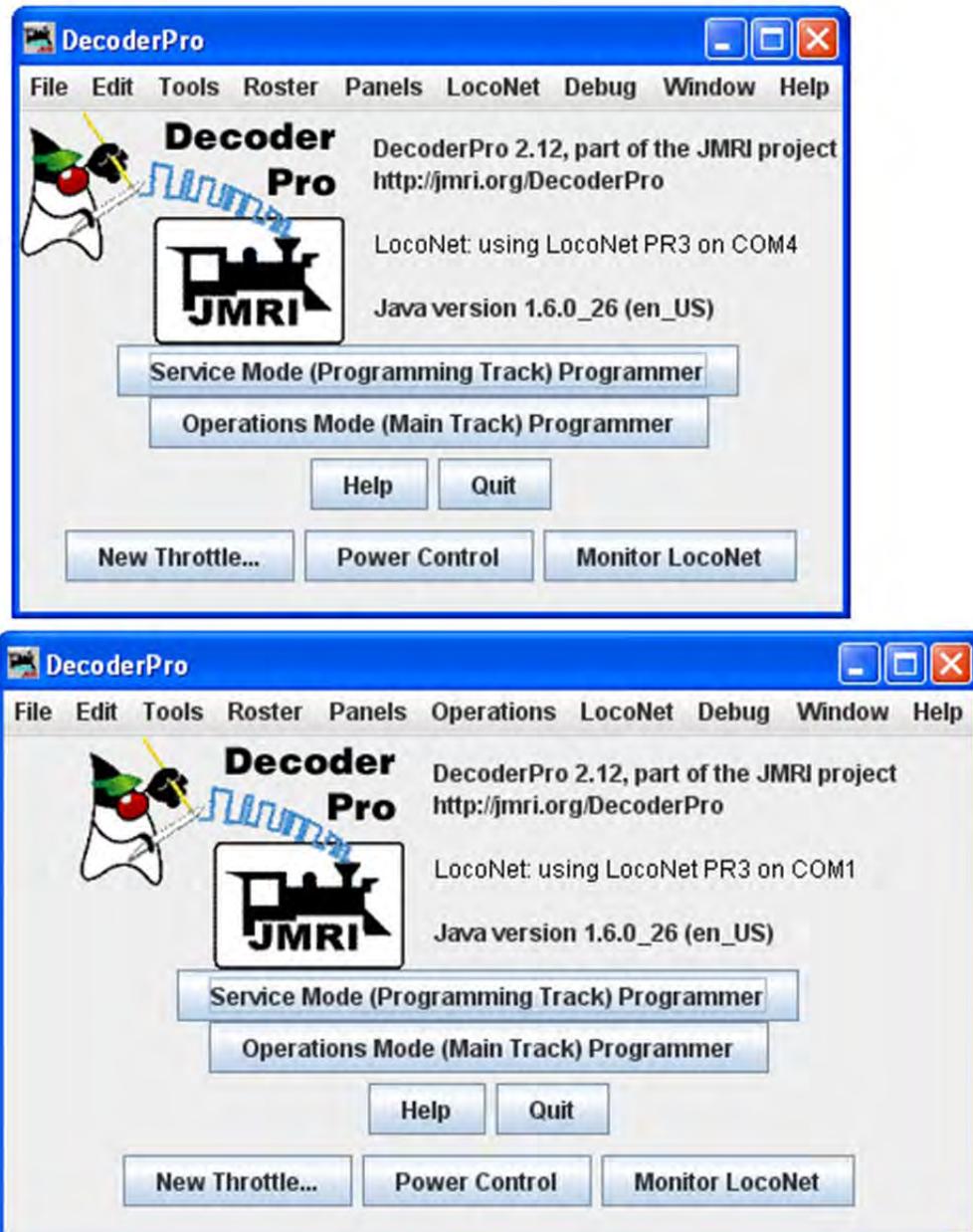
See Pane in Comprehensive Programmer.



## CHAPTER 8 - DECODERPRO® MAIN WINDOW

### MAIN WINDOW OVERVIEW

When you start Decoder Pro, the DecoderPro window is displayed. All of the JMRI functions can be accessed via the menu bar on the DecoderPro® window, additional menus are added when functions are selected, example below with added operations menu(selected on operations setup window), which is also in the tools menu.



### MENU BAR

# JMRI® User's Guide Version 2.12

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Provides access to the menus that allow you to access all the features of JMRI/  
DecoderPro® icon and DecoderPro version information is displayed.

The version of Java installed and in use is also shown

**Service Mode (Programming Track) Programmer** button provides access to the decoder programming capability in  
[Service Mode Programmer](#)

**Operations Mode (Main Track) Programmer** button provides access to the [Operations Mode Programmer](#).

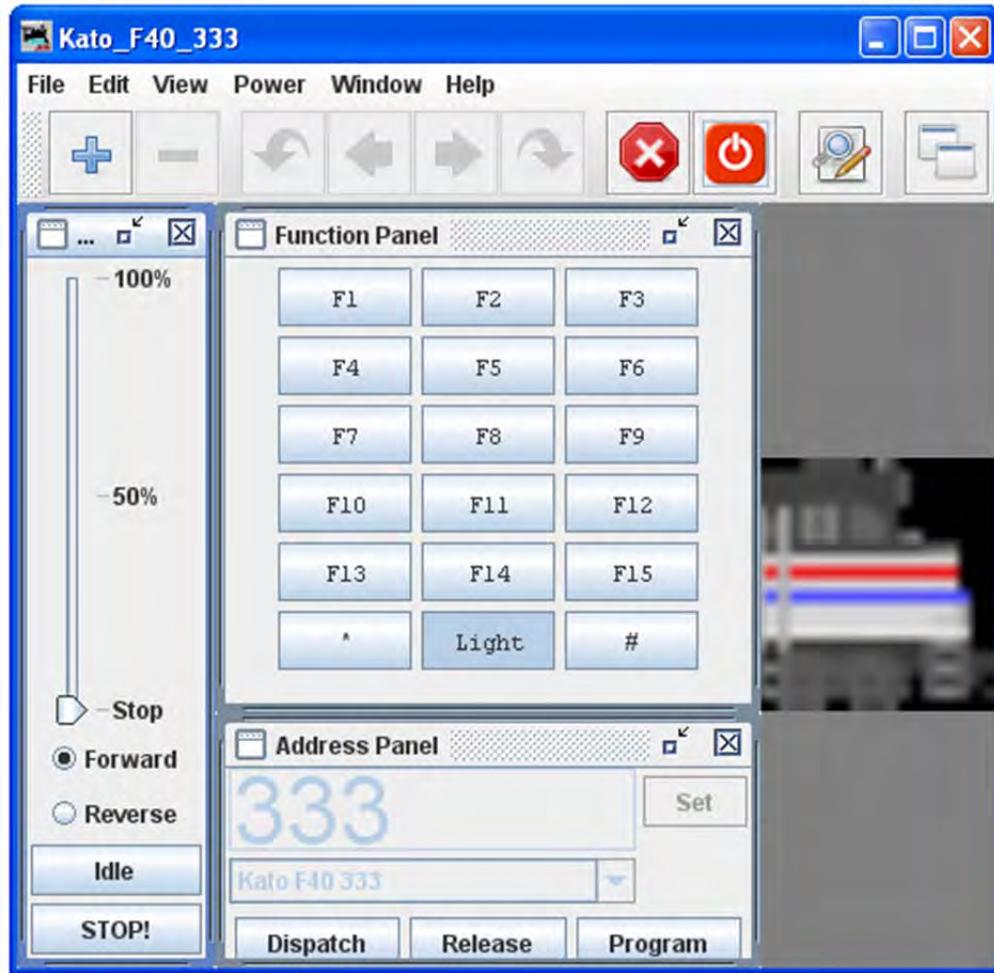
**Help** button opens the Help Window

**Quit** button exists the program, with confirmation dialog.

## ADDITIONAL AND OPTIONAL BUTTONS

The buttons shown at the bottom of the window are not JMRI defaults, but instead are setup in your **preference** to open each time you start DecoderPro®. The following are samples that could be set in your preferences. (Shown are for a Digitrax LocoNet system)

**New Throttle....** Button opens a throttle window which provides a tool to control your trains, you may open more than one throttle and position on the computer screen



Monitor LocoNet button opens the Monitor LocoNet window that allows you to monitor the commands and responses on the LocoNet.



**Power Control** button opens Power Control window, which allows you to turn track power on or off during operations.



These are just samples of the possible buttons that may be added at startup.

## MENU OVERVIEW

All of the JMRI functions can be accessed via the menu bar on the DecoderPro® window.



### FILE

- Print Decoder Definitions...
- Print Preview Decoder Definitions...
- Quit

### EDIT

- Cut
- Copy
- Paste

- Preferences

## TOOLS

- **Programmers** ►
  - Single CV Programmer
  - Service Mode Programmer
  - Ops-Mode Programmer
  - Multi-Decoder Control
- **Tables»**
  - Various Tables used with Panel Pro and not covered in this manual
- **Throttles** ►
  - New Throttle
  - Throttles List Window
  - Save Throttle Layout...
  - Load Throttle Layout...
  - Save as Default Throttle Layout
  - Load Default Throttle Layout
  - Start WiThrottle
- **Consisting Tool...**
- **Clocks** ►
  - Setup Fast Clock...
  - Nixie Clock
  - LCD Clock
  - Analog Clock
- **Power Control**
- **Turnout Control...**
- **Simple Signal Logic**
- **Sensor Groups...**
- **Speedometer...**
- **Light Control...**
- **Dispatcher...**
- **Send DCC Packet...**
- **USS CTC Tools»**(not covered in this manual)
- **Operations** ►(on menu bar only if checked in the Operations Settings)
  - [Settings](#)
  - [Location](#)
  - [Cars](#)
  - [Locomotives](#)
  - [Routes](#)
  - [Trains](#)

## ROSTER

- **Create Entry...**
- **Edit Entry...**
- **Copy Entry...**
- **Import Entry...**
- **Export Entry...**
- **Delete Entry...**

- [Print Summary...](#)
- [Print Preview Summary...](#)
- [Roster Groups](#) ►
  - Create Roster Group
  - Set Active Roster Group
  - Delete Roster Group
  - Table Association
  - Associate Roster Entry to Group
  - Disassociation of Roster Entry to Group
- [Export Complete Roster...](#)

## PANELS

Beyond the scope of this manual, primarily for use in connection with PanelPro

## SYSTEM

(THIS MENU NAME WILL DEPEND UPON THE SYSTEM THAT YOU SELECTED IN PREFERENCES. THE OPTIONS ARE LISTED. IF (NONE) IS SELECTED IN PREFERENCES THIS MENU WILL NOT BE DISPLAYED.)

- [Acela](#)
- [CMRI](#)
- [EasyDCC](#)
- [Grapevine](#)
- [LocoNet](#)
- [NCE](#)
- [OakTreeSystems](#)
- [Powerline](#)
- [QSI](#)
- [RPS](#)
- [SECSI](#)
- [SPROG](#)
- [TMCC](#)
- [wangrow](#)
- [XpressNet](#)
- [Zimo](#)

## DEBUG

- [Memory Usage Monitor](#)
- [Import Decoder File](#)
- [Import Decoder URL](#)
- [Recreate Decoder Index](#)
- [Recreate Roster Index](#)
- [Check XML File](#)
- [Validate XML File](#)
- [Check Decoder Names](#)
- [Check Programmer Names](#)
- [Load Logix Disabled](#)

- [Log Message](#)
- [Display Message Log](#)
- [Display Log Categories](#)
- [Listed Table Access](#)
- [Listed Table Access-Direct to Routes](#)
- [\*\*PRICOM\*\* ►](#)
  - PRICOM Pocket Tester»
    - Connect
  - PRICOM Flash Updater
- [USB Input Control](#)
- [USB Device Viewer](#)
- [RailDriver Throttle](#)
- [Start Mini Web Server](#)
- [Start Wi Throttle](#)

## WINDOW

- [Minimize](#)

(lists all DecoderPro windows that are open)

- [DecoderPro](#)
- [LocoNet Traffic](#)
- [Power Control](#)

## HELP

- [Window Help...](#)
- [General Help...](#)
- [License...](#)
- [Locations...](#)
- [Context....](#)
- [System Console...](#)
- [Upload Debugging Info...](#)

## MAIN MENU DETAIL

### FILE MENU

**PRINT DECODER DEFINITIONS...**

Opens your computer Print dialog to print the installed decoder definitions. The complete list may be more than 25 printed pages. The format is shown below.

# JMRI® User's Guide Version 2.12

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DecoderPro V2.12 Decoder Definitions - 1 - August 9, 2011 3:17 AM



NMRA  
NMRA standard CV definitions  
NMRA standard register definitions  
Raw CVs 1-255

Arnold - Rivarossi  
ARNOLD Digital  
ARNOLD 81210-81

Atlas  
Four Function Dual Mode  
Four Function #345  
Four Function #345 H15-44/H16-44  
Dual Mode  
Atlas N-Scale  
VO1000 (Part #500099)

Broadway Limited Imports, LLC  
Paragon 2  
Diesel  
Steam

Blueline  
Diesel  
Steam

Bachmann Trains  
E-Z Command decoders  
2 function decoder (36-552)  
1 function decoder (36-551)  
4 function decoder (36-550)

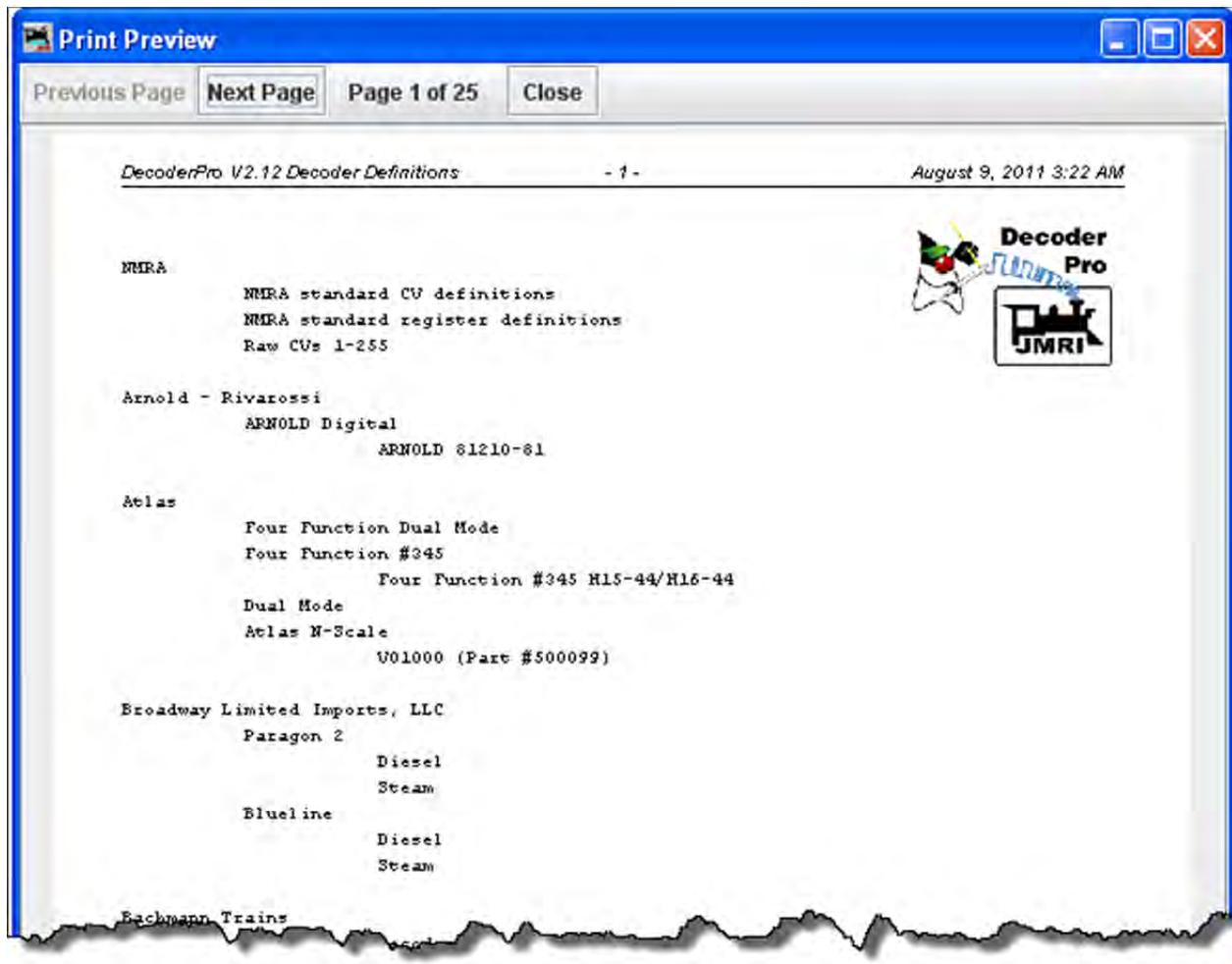
CML Systems  
DAC10  
DAC20

CT Elektronik  
Function Decoder  
DCX30  
DCX30V  
DCX Series (v.66 and higher)

## PRINT PREVIEW DECODER DEFINITIONS...

Opens your computer Preview window opens. A list of all the Decoder Definitions installed in DecoderPro will be displayed. You then can decide whether to print the pages.

# JMRI® User's Guide Version 2.12



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**QUIT**

Closes DecoderPro and all associated functions, same as clicking on the Quit button

**EDIT MENU**

**CUT**

Removes the selected text and temporarily stores it in your computer's clipboard

**COPY**

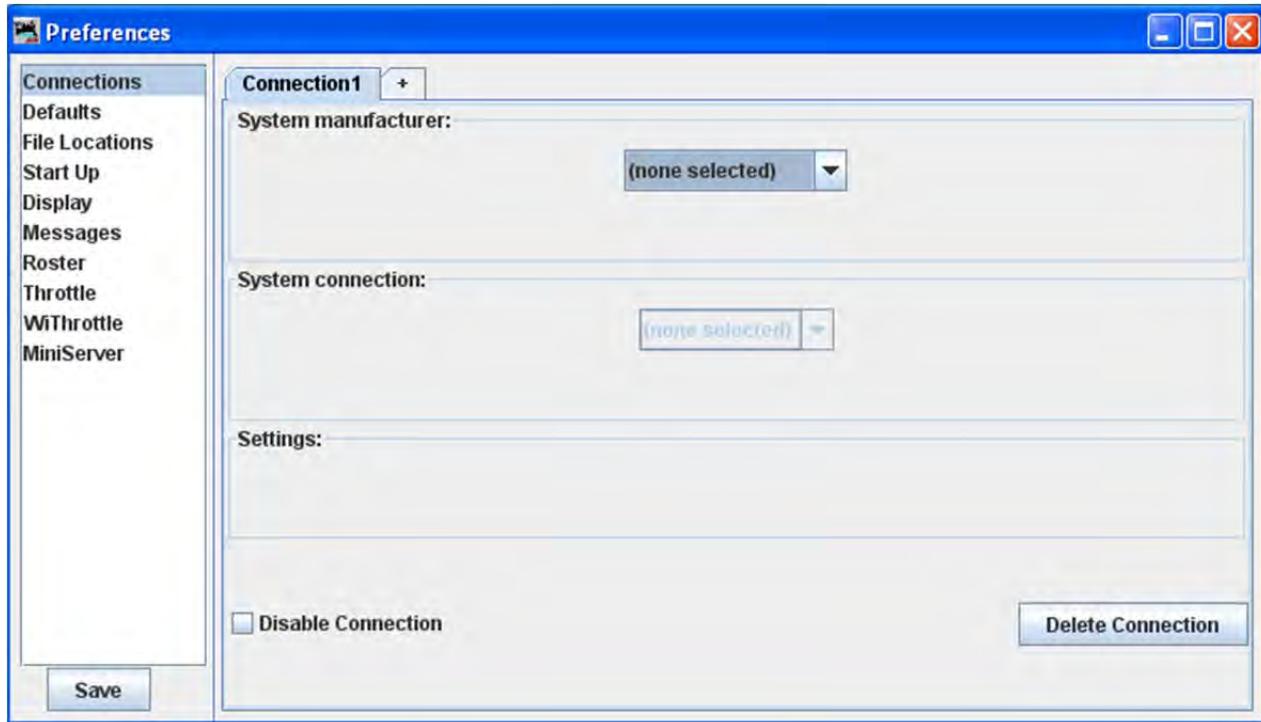
Copies selected text into the computer's clipboard

**PASTE**

Pastes the contents of your computer's clipboard to the location of your cursor

Preferences...

Opens the [Preferences window](#).



TOOLS MENU

PROGRAMMERS ►

- **Single CV Programmer**

Opens the [Simple Programmer](#)

- **Service Mode Programmer**

Opens the [Service Mode Programmer](#).

- **Ops-Mode Programmer**

Opens the [Ops-Mode Programmer](#).

- **Multi-Decoder Control**

Opens the [Multi-Decoder Control](#) window.

TABLES ► (ADVANCED USERS, BEYOND THE SCOPE OF THIS MANUAL)

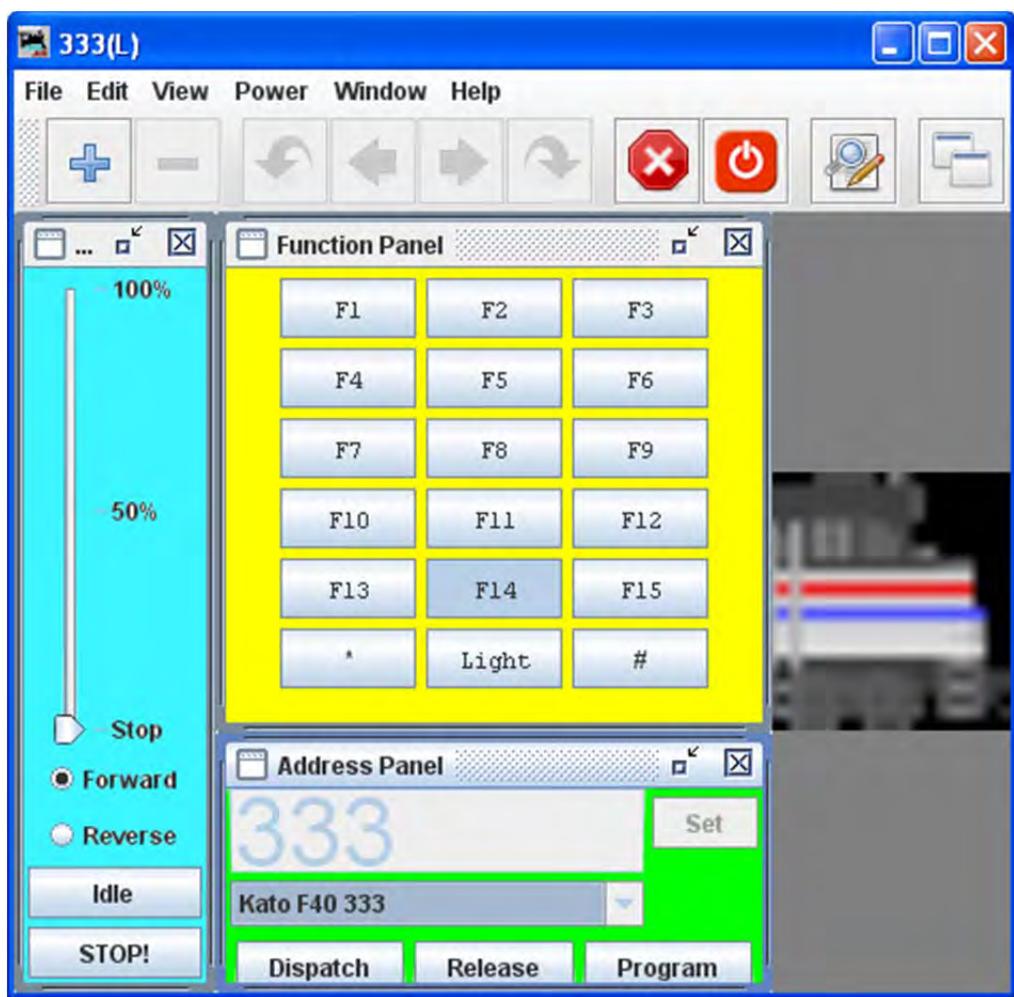
A series of tables that are used with PanelPro Panels to automate your layout.

## Throttles ►

- **New Throttle...**

Opens a [Throttle](#) window (more than one throttle may be in use at a time)

The DecoderPro® Throttle may be used on your computer screen to replace the vendor throttle that is furnished with your DCC system. One or several throttles may be in use at one time. The Throttle opens as a floating window that may be positioned anywhere on your desktop. Note the Title Bar contains the locomotive address information.



(color shading added to show functional areas throttle panels)

The Throttle Window contains **Menu Bar**:



- File

**New Throttle...**

Opens another copy of the throttle.

**Load Throttle**

Opens the Open dialog to allow you to select the desired Throttle XML file

**Save Current Throttle**

Save the displayed throttle to its designated file name

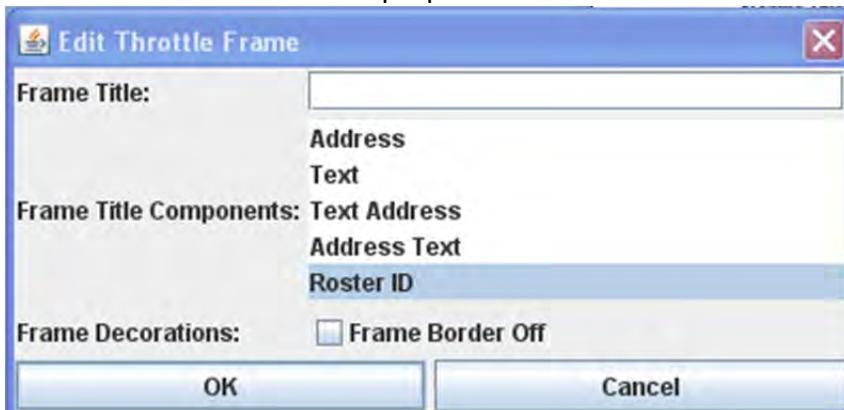
**Save Current Throttle As...**

Opens the Save dialog to allow you to save the Throttle XML file in the location you select and using the name you specify

- EDIT

**Frame Properties**

Opens the Edit Throttle Frame dialog and allows you to edit the current throttle window title and selected Frame properties.



**Frame Title:** Type the title of your choice for the Throttle frame. This is referred to below as “text”.

**Frame Title Components:** Select the text component desired. There are two components which can be in the title bar of the throttle “Text” and “Address”. The selections allow either or both to be in the title (in the order they appear in the selection), or one can opt for the description in the locomotive Roster Entry

**Address** --Automatically display the address of whatever locomotive is selected. (default)

**Text** -- Display the text that you enter in the field as the title at the top of this window

**Text Address** -- Display the text you entered, followed by the selected address

Address Text -- Display the selected address, followed by the text you entered

**Roster ID** -- Display the selected roster ID

(Note that if you enter text, it will not be visible unless one of the middle three modes is selected)

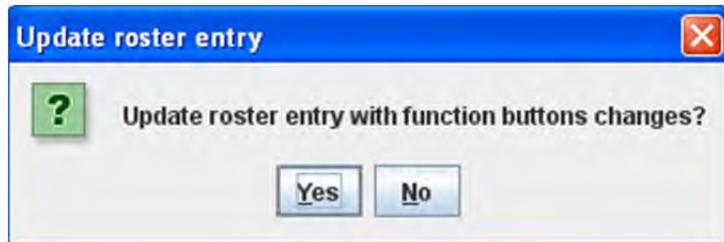
**Frame Decorations:**

This will remove the individual control bars for the separate panes of the throttle. This is advised for Windows users, as clicking the minimize buttons causes the restore button to be lost behind the rest of the panels. Recovery entails using the view menus to remove and then restore the panel in question.

OK button adds the edits

Cancel button aborts the operation

### Export Current Throttle Customization to roster



- **VIEW --**

Allows you to select which of the three panels of the throttle are being shown. Place a check mark in each of the panels that you want to display.

- **Address Panel**
- **Control Panel**
- **Function Panel**

You may ask yourself, "Why would I want to turn off any of these panels?" As only one example, let's say we have an observation car at the rear of a passenger train. We could equip this car with a function only decoder to control:

Interior lights,  
Rear marker lights, and

A rear Drum light.

We have no need for the speed control pane and only need three function buttons for this “Throttle”.

With a whole passenger train equipped like this, lots of screen space can be conserved by using the throttle set-up files to optimize the **Throttle** windows. Then you could turn off the lights in the kitchen and lower the lights in the dining area so the passengers can enjoy the sunset as they transit the Rockies enjoying the beautiful sunset sipping Cognac.... but I digress. You get the idea.

## **Reset All Function Buttons**

Resets all the Function buttons to the default settings F1 key, F2 key, etc.

## **Get all throttle components in bounds**

Returns all the throttle panels to the throttle frame.

## **Power (*track power control, if supported by your system*)**

**Power On**

**Power Off**

## **Window**

### **Minimize**

Lists all open DecoderPro windows. If one of the windows is clicked it will be brought to the front so that you can minimize it to the system tray.

## **Help**

Window Help...

General Help...

License...

Locations...

Context

System Console

Upload Debugging Info...

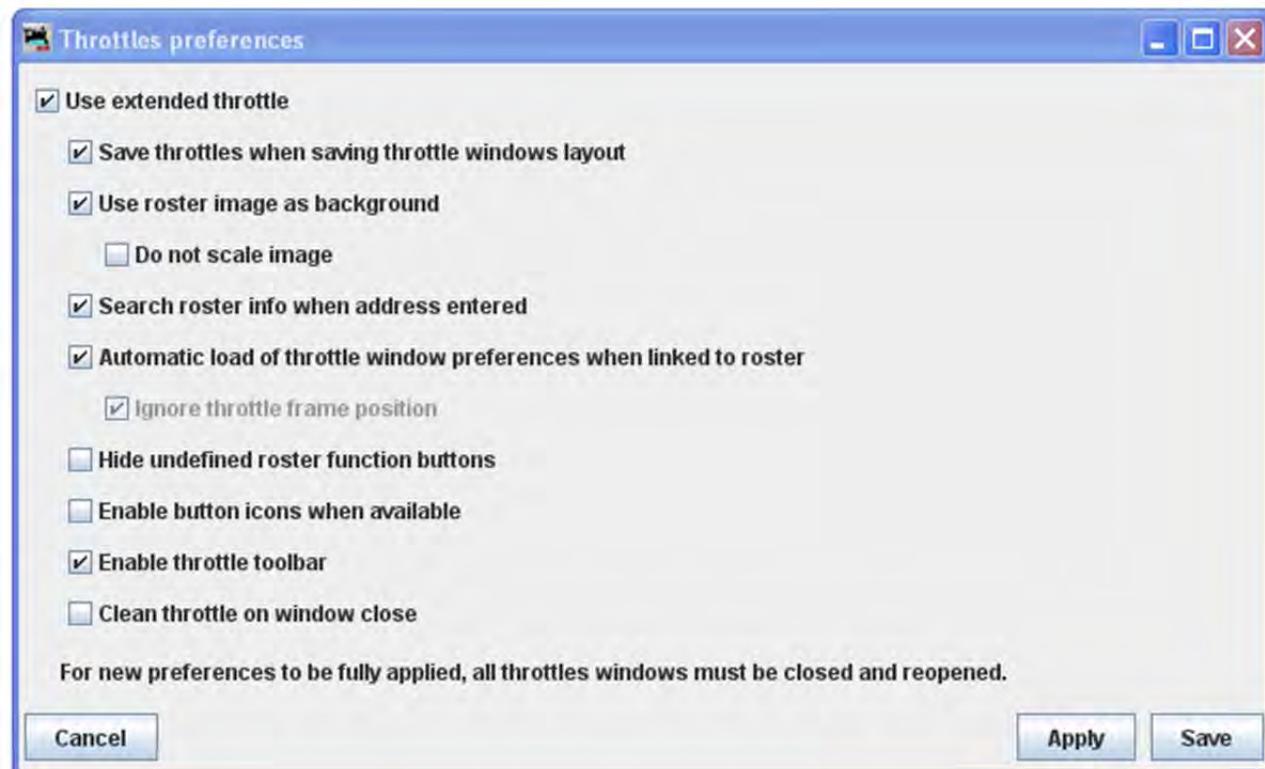
TOOLBAR and three panels which may be enabled or disabled via check box in the View menu. Each panel has a title bar with windows controls to minimize, maximize and exit:

**Warning!!!** Be careful with the left hand (minimize) buttons. In Windows, if the little guy is clicked it will minimize the panel, which means it is no longer visible but the restore button is lost behind the rest of the panels. The way to easily get it back, is to go into the view menu, uncheck it there, then go back again and re-check it. You may also drag the panels out of the way to uncover the Maximize icon for a minimized panel.



The Throttle toolbar is enabled from the [Throttles Preferences Pane](#)

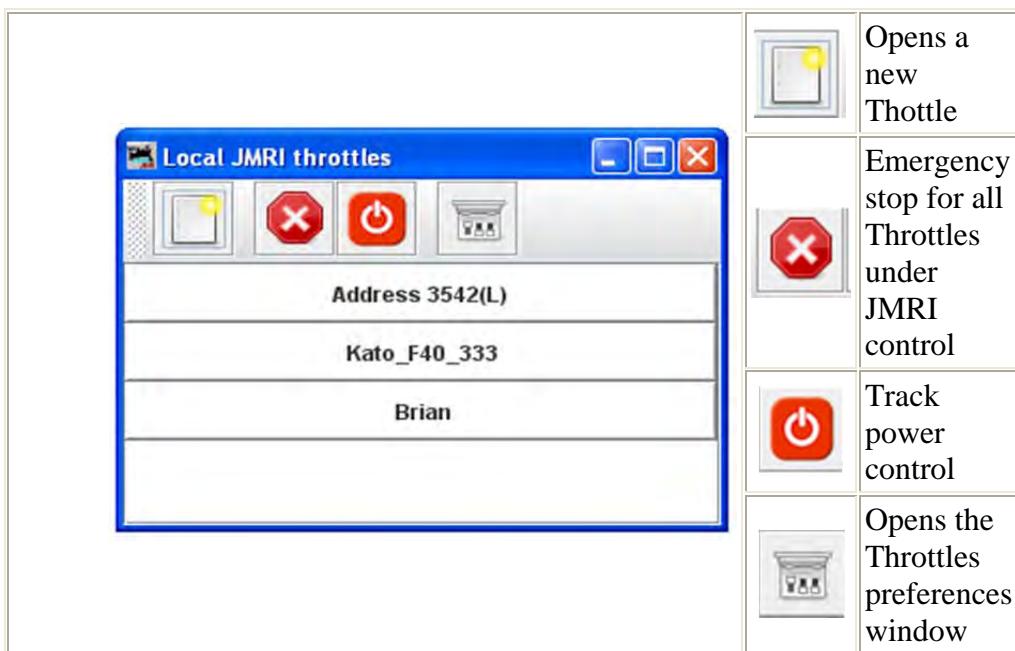
Use Throttles preferences window to set the desired preferences.



When it is enabled, a Throttle Window can host a set of Throttles. You can browse through these throttles: Add a new Throttle in that Throttle Window. Once the number of Throttles in a Throttle Window is greater than one, Next and Previous Icons are enabled.

-  Open a new Throttle Window
-  Closes the current Throttle Window
-  Return to Previous running Locomotive.

-  Goes to previous throttle.
-  Goes to next throttle
-  Goes to next running locomotive
-  Issues an emergency stop command to all locomotives under JMRI control.
-  Controls track power on or off, if supported.
-  Switch to or revert from Edit Throttle mode.
-  Opens the [Local JMRI Window](#)



ADDRESS PANEL (green shading) facilitates setting the address of the locomotive you wish to control with the throttle.



Primary use is to identify the decoders address, and to dispatch or release the identified address. Locomotive address may be entered by one of two methods: typed into text box or use drop-down list to select locomotive from your roster. . If you have added [Function labels](#), to your Roster, the label text from the Roster will be displayed on the throttle function buttons.

Click on the Set button to send the address to your system to make this throttle active.

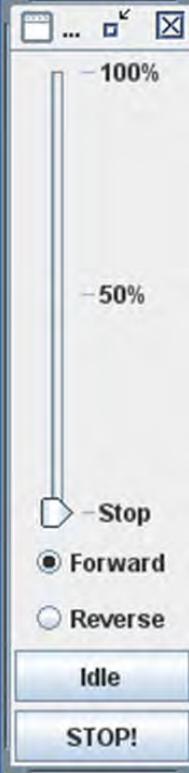
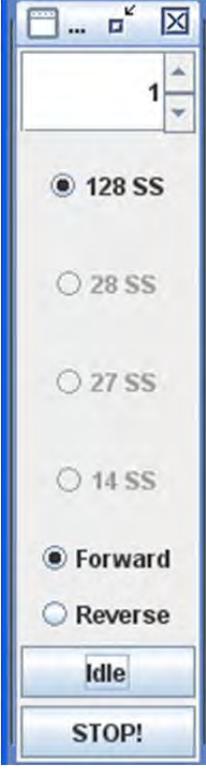
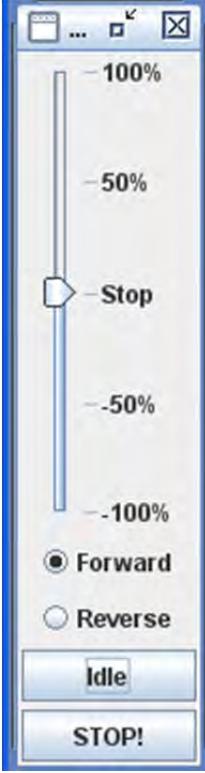
Dispatch button is used to dispatch the locomotive which releases the throttle for that address so that it can be acquired by another throttle

Release button is used to release the address from your system.

Program button opens the [Programmer](#) for the locomotive selected in ops-mode (Programming on the Main) Only active when roster entry is used to select the address for the throttle.

Any of the buttons may be grayed out depending on the status of your system.

CONTROL PANEL (blue shading) contains the controls for applying power to the locomotive that is addressed and controlling speed

		
SLIDER FROM 0% TO 100%	SPEED STEPS	SLIDER 100% TO 100% THROUGH 0%

After you have established an address for the throttle, you should be able to run the train on your layout. The Control panel is used to control the speed and direction on your locomotive when the throttle is used to operate on a layout.

The throttle slider controls the speed and indicates the percentage of power from **Stop** to **100%**. Use mouse to drag the slider to the desired speed

Alternately, the slider may be set to **STOP** in the middle and move to + 100% or to -100% to control locomotive speed.

In the Step mode the up and down arrows control the speed one step at a time, or you may enter a number into the text box area between 0 and the max step indicated.

 **Forward** and  **Reverse** set the locomotives direction.

Stop button executes an emergency stop, locomotive stops immediately overriding any BEMF or momentum programmed into the decoder.

Idle button stops the locomotive smoothly using any momentum setting programmed into the decoder..

Control Panel Properties may be set by right clicking on the Throttle Control Panel (Speed), the **Edit Speed Control Panel** dialog is displayed. This allows you to select either of the two slider or step speed controls



- Display Speed Slider(from 0 to 100)**-- displays the Throttle Control shown at the left
- Display Speed Steps** -- displays the Throttle Control shown in the middle
- Display shunting speed slider(from 100 to 0 to 100)** -- displays the Throttle control shown on the right
- Track sider in real time**

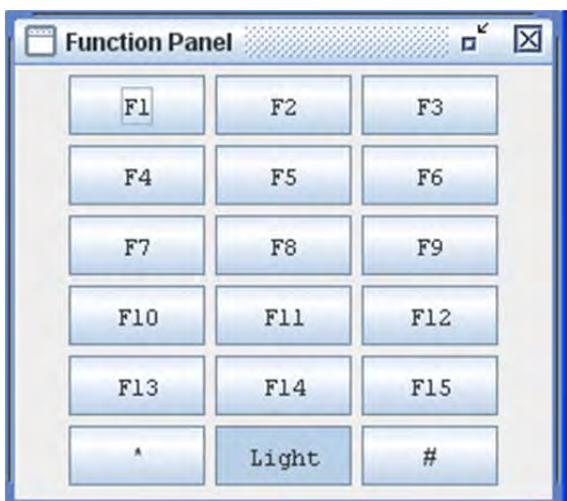
**Switch to continuous speed slider on function:**  Enter the function from the **Function Panel** that you want to use.

OK button Sets the selections

Cancel button cancels any settings

FUNCTION PANEL(yellow shading) contains all the function buttons used to control the addressed locomotives functions.

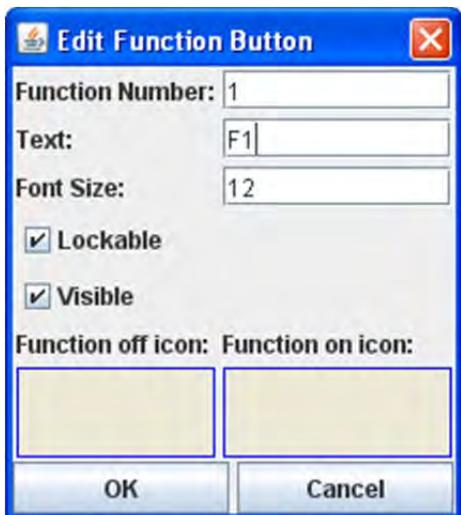
## THROTTLE FUNCTION PANEL



The **Throttle Function Panel** allows you to select the decoder functions from F0 through F15 on first overlay and F16 through F28 on second overlay. Many new Sound decoders use up to 28 functions.. use the to toggle between the two overlays

If you have entered [Function labels, using the Advanced Programmer](#), the label text will appear on the throttle Function buttons.

Another way to change the labels on the function buttons, is to right click on the button that you want to edit, the word **Properties..** is displayed and when clicked on, an **Edit Function Button** dialog box will be displayed.



**Edit Function Button** allows you to edit the text displayed on the button and the function assigned.

**Function Number:** text box to set the function assigned to the button.

**Warning!!!** Make sure you do not assign the same function number to more than one button, otherwise, undesirable results may occur

**Text:** the text you want displayed on the button.

**Font Size:** Select the font size in points.

**Lockable** - locks the function when button is clicked. eg makes the button a push on / push off button.

**Visible** - makes the button visible. When unchecked the button will not show in the panel. To restore use the **View** menu and select **Show All Function Buttons** option.

**Function off icon:**



Drag and drop icon of your choice into the box. To remove icon right click and click on Remove.

## Function on icon:



Drag and drop icon of your choice into the box. To remove icon right click and click on Remove.

sets all the values edited.

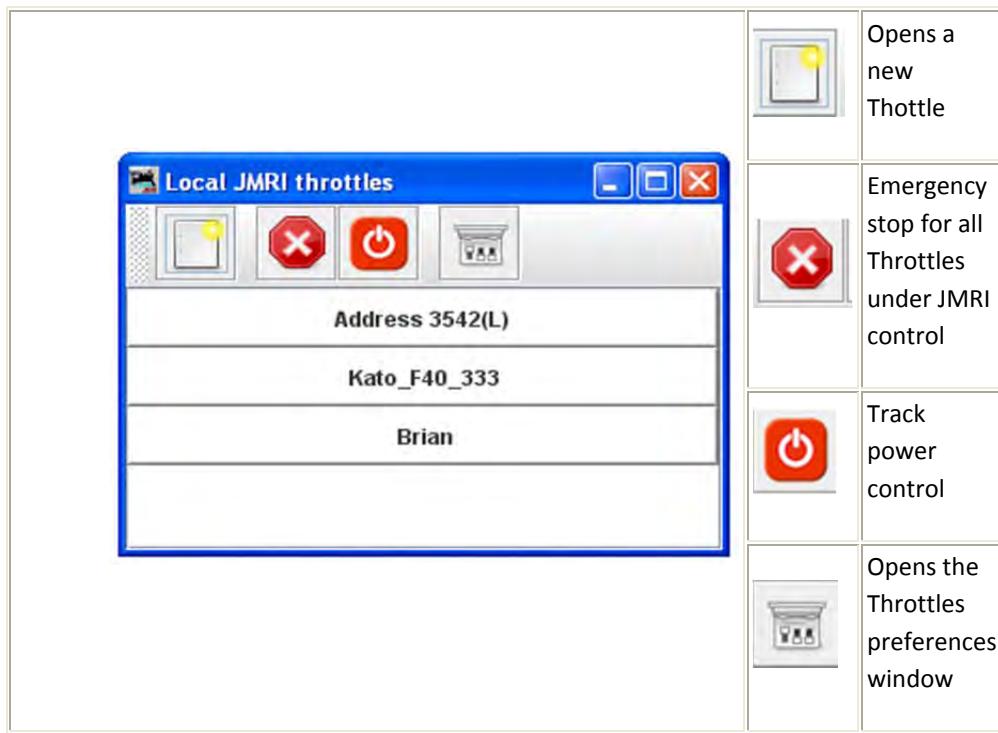
exits dialog without change.

You can use the **Save** button on the [Address Panel](#) to save the edited functions to your locomotives Roster entry.

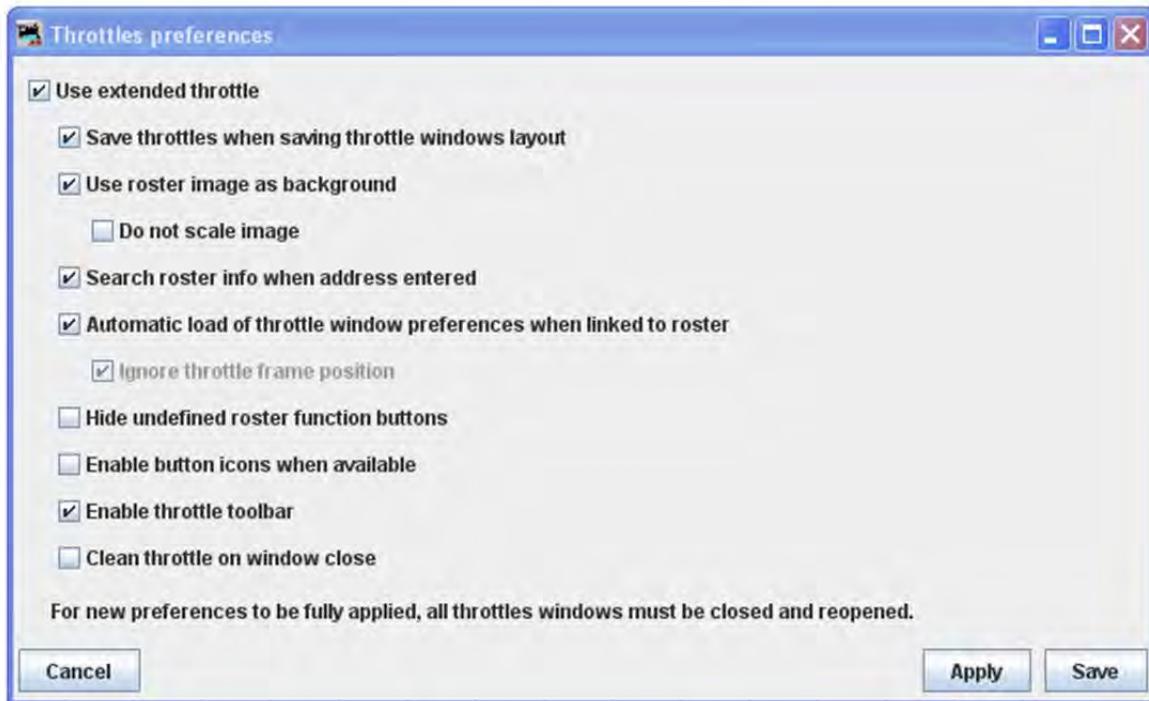
The descriptions shown above are only a small part of what the **Throttle** Window can do. The author(s) of the **Throttle** Window have created an extensive set of Help files to help you customize Throttle Windows to your way of operating. To access Help, just open a New **Throttle**. Then, click on **Help** and select **Window Help** from the dropdown box. There's lots of good stuff in there.

- **Throttles List Window**

Opens the Local JMRI throttles Window,



Use Throttles preferences window to set the desired preferences.



- **Save Throttle Layout...**

Displays the **Save** dialog box to save your throttle as an XML file to the default folder, in Windows XP: C:\Document and Settings\userName\JMRI\throttles. This can be changed in the save dialog box.

- **Load Throttle Layout...**

Displays the **Open** dialog box allowing you to select a throttle file that has been saved in the default folder above, or the location of your choice.

- **Save as Default Throttle Layout**

Saves your current Throttle as the default layout

- **Load Default Throttle Layout**

Loads the Throttle that you saved as the default

### CONSISTING TOOL...

Opens the Consist Control window.

### Clocks ►

- [Setup fast Clock...](#)

Opens Fast Clock Setup window

- Nixie Clocks



- **LCD Clock**

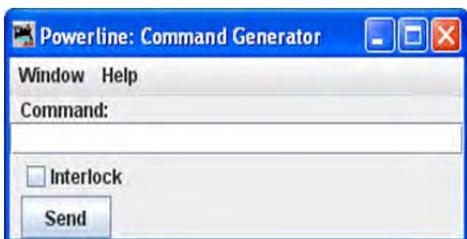


- **Analog Clock**



## POWER CONTROL...

Opens the Power Control Panel, which allows you to turn the power to layout ON/OFF



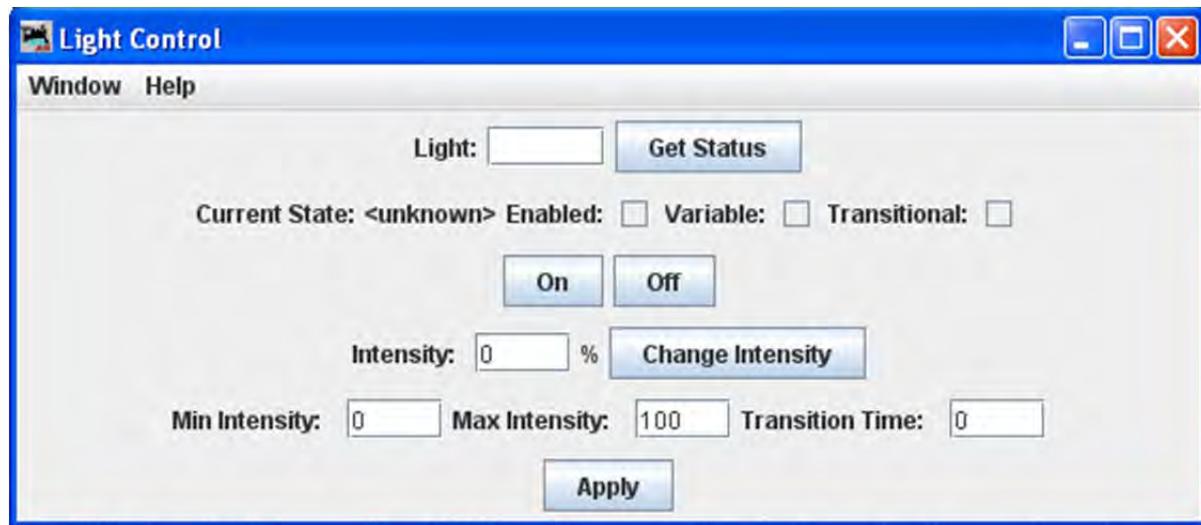
## TURNOUT CONTROL...

Simple Signal Logic (ADVANCED USERS, BEYOND THE SCOPE OF THIS MANUAL)

Sensor Groups.... (ADVANCED USERS, BEYOND THE SCOPE OF THIS MANUAL)

Speedometer...[\\_](#)

## LIGHT CONTROL...



This tool is used to control Power line Devices that are used to control your layout lighting.

Enter the light system name for the light you wish to control in the **Light:** text box

Click on either the **On** button to turn the light on or **Off** button to turn off the light.

**Current State:** Shows the current known state of the light.

**<Unknown>** Either no light selected or invalid light name.

**<Off>** Light is at minimum intensity, if variable intensity is supported, or off

**<On>** Light is at maximum intensity if variable intensity supported, or full on.

**<Intermediate>** Light intensity is between 0 and 100% and the current intensity is equal to the target intensity.

**<Transitioning Higher>** Target intensity is higher than the current intensity and light is adjusting every fast minute according to Transition Time value.

**<Transitioning Lower>** Target intensity is lower than the current intensity and light is adjusting every fast minute according to Transition Time value

**<Transitioning to Full On>** Target intensity is higher than the current intensity, and equal or higher than maximum intensity and light is adjusting every fast minute according to Transition Time value.

**<Transitioning to Full Off>** Target intensity is lower than the current intensity, and equal or lower than minimum intensity and light is adjusting every fast minute according to Transition Time value.

Configuration Options of Lights:

- Enabled:** The light will respond to its automatic control type.
- Variable:** Light may be commanded to values between 0% and 100%.
- Transitional:** Changes the intensity will use the transition time to step between current and target intensity.

**On** button turns on the light.

**Off** button turns off the light.

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Dispatcher... (ADVANCED USERS, BEYOND THE SCOPE OF THIS MANUAL)

---

Send DCC Packet... (NOT COVERED IN THIS MANUAL)

---

USS CTC Tool ► (ADVANCED USERS, BEYOND THE SCOPE OF THIS MANUAL)

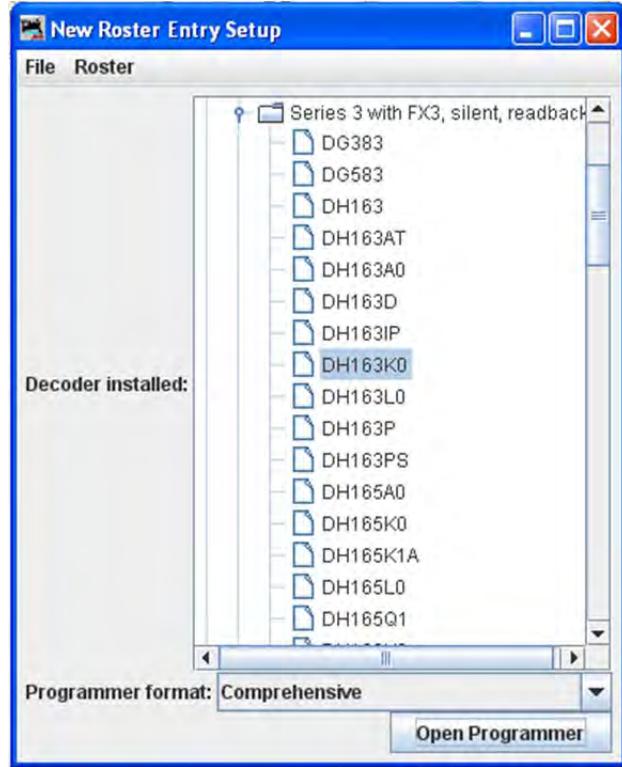
---

Operations ►

- **Settings**
- **Locations**
- **Cars**
- **Engines**
- **Routes**
- **Trains**

## ROSTER MENU

### Create Entry...



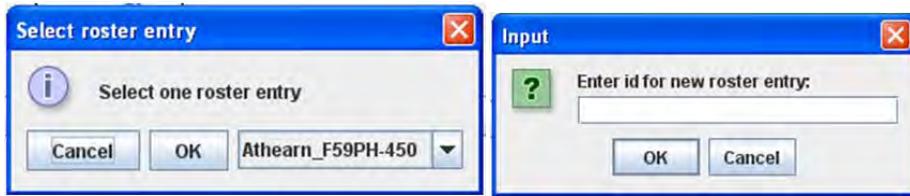
Select a decoder that matches the one installed in your locomotive. The Open Programmer button will now become activated and you'll be able to move on with the Programmer selected from the drop-down list, then click on the **Open Programmer** button, the selected Programmer window will open. All programmers, Basic and Comprehensive, open to the [Roster Entry pane](#).

### EDIT ENTRY...



### COPY ENTRY...

Opens the [Select roster entry](#) dialog box. After you select the roster, the [Input prompt](#) will be displayed. Useful when you have two locomotives with the same decoder program but different addresses.



## IMPORT ENTRY...

The **Open** dialog is displayed, select the roster file (roster.xml) that you wish to import. The [Input prompt](#) will be displayed. The roster file will be imported, update your roster index in the **Debug** menu



## EXPORT ENTRY...

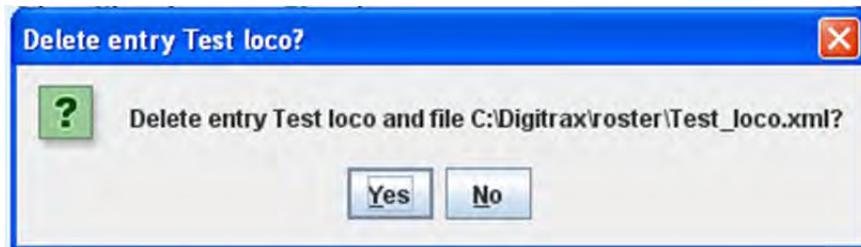
Opens the [Select roster entry](#) dialog box. Next the **Save** dialog will be displayed, select the location where you would like to save the roster file.



## DELETE ENTRY...

Opens [Delete roster entry](#) prompt box. Used to remove an entry from the DecoderPro roster.

Select the roster from the drop-down list that you wish to delete from DecoderPro. Click **OK** and the Confirmation box **Delete entry *fileName*?** is displayed.. Click **Cancel** button if you wish to abort this function.



**Yes** button deletes file, **No** button aborts the operation.

## PRINT SUMMARY...

# JMRI® User's Guide Version 2.12

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Opens your operating systems printer dialog and when print is selected, prints a complete summary of your roster entries. (typically 5 entries per page, so be prepared to print several pages).

## PRINT AND PRINT PREVIEW

Both generate a printout that looks like this. The difference is that preview is only on your screen, whereas print summary prints it onto paper.

The screenshot shows a window titled "DecoderPro Roster" with a header "January 16, 2009 2:21 AM". It contains five entries, each with a small icon of a locomotive and the text "Decoder Pro" above a "JMRI" logo. The entries are as follows:

ID:	Athearn_F59PH-450
Filename:	Athearn_F59PH-4500.xml
Road name:	MTRAK
Road number:	450
Manufacturer:	Athearn
Owner:	Dale A. Tripp
Model:	F59PH
DCC Address:	450
Decoder Model:	DZ123
Decoder Family:	Series 3 with FX3, silent, readback

ID:	Athearn_F59PH-461
Filename:	Athearn_F59PH-450.xml
Road name:	MTRAK
Road number:	461
Manufacturer:	Athearn
Owner:	Dale A. Tripp
Model:	F59PH
DCC Address:	461
Decoder Model:	DZ123
Decoder Family:	Series 3 with FX3, silent, readback

ID:	Atlas GP38-3501
Filename:	Atlas_GP38-3501.xml
Road name:	Santa Fe
Road number:	3501
Manufacturer:	ATLAS
Owner:	Dale A. Tripp
Model:	GP38
DCC Address:	3501
Decoder Model:	DN163A0
Decoder Family:	Series 3 with FX3, silent, readback

ID:	Atlas GP38-3520
Filename:	Atlas_GP38-3520.xml
Road name:	Santa Fe
Road number:	3520
Manufacturer:	ATLAS
Owner:	Dale A. Tripp
Model:	FS9PH
DCC Address:	9620
Decoder Model:	DN163A0
Decoder Family:	Series 3 with FX3, silent, readback

## PRINT PREVIEW SUMMARY...

Open print preview window and displays your roster but nothing will be sent to the printer.

## Roster Groups ►

### CREATE ROSTER GROUP

Use Create Roster Group to define any other groups you wish. Opens **Create new roster group** dialog



Type the name of your new roster group in the Create new roster Group

Cancel button if you do not want to create a new roster Group

OK button creates a new roster group

### SET ACTIVE ROSTER GROUP

Opens the **Select roster group** dialog. Once the associations have been made, then you can select the Active Roster Group.



The Global Roster Group all rosters entries is the current active group. You may select one of the Roster Groups to be active from drop-down menu

Press **Cancel** button if you do not want to set an active roster Group

OK button sets the selected roster group as active

### DELETE ROSTER GROUP

Opens the Delete roster group entry. This does not delete individual roster entries.



Select the Group Roster that you want to delete from the drop-down menu

Press **Cancel** button if you do not want to delete a roster Group

**OK** button deletes the selected roster group as active

## TABLE ASSOCIATION

### ASSOCIATION OF ROSTER ENTRIES TO A ROSTER GROUP

Once the groups are named, then you “associate” the roster entries with their group. This can be done two ways.

1. You can use the **Associate Roster Entry to Group** to select a group and a roster entry. This method is best used when only a few associations need to be made, like when a new loco has been added to the roster. Then you can concentrate on the groups it belongs to.
2. The other method is to use the **Table Association** selection. At the top of the table you select the group you wish the roster entries to be associated with, then the roster entries that you Opens the **Roster Group Table** which will allow you to assign roster entries to a Roster Group.

The window title is "Roster Group Table". The menu bar includes "Window" and "Help". A dropdown menu "Select Roster Group:" is set to "Santa Fe". The main area is a table with columns: Road Num..., ID, Road Name, Manufact., Owner, and Add to ... (checkboxes). The table lists various locomotives and their details, with checkboxes in the last column indicating association status.

Road Num...	ID	Road Name	Manufact...	Owner	Add to ...
505		AMTRAK	ATLAS	Dale A. Tripp	<input type="checkbox"/>
450	Athearn_F59PH-4...	AMTRAK	Athearn	Dale Tripp	<input type="checkbox"/>
481	Athearn_F59PH-4...	AMTRAK	Athearn	Dale Tripp	<input type="checkbox"/>
3276	Atlas GP-30 3276	Santa Fe	Atlas	Dale Tripp	<input checked="" type="checkbox"/>
3501	Atlas GP38-3501	Santa Fe	ATLAS	Dale Tripp	<input type="checkbox"/>
3520	Atlas GP38-3520	Santa Fe	ATLAS	Dale Tripp	<input type="checkbox"/>
4803	Atlas SD26	Santa Fe	Atlas	Dale Tripp	<input type="checkbox"/>
6365	B23-7-6365	Santa Fe	Atlas	Dale Tripp	<input type="checkbox"/>
6365	B23-7-6366	Santa Fe	Atlas	Dale Tripp	<input type="checkbox"/>
6390	B23-7-6390	Santa Fe	ATLAS	Dale Tripp	<input checked="" type="checkbox"/>
6932	Bachman DD40X-...	Union Pacific	Bachman	Dale Tripp	<input type="checkbox"/>
1000	Bachmann 44ton ...	none	Bachma...	Dale Tripp	<input type="checkbox"/>
2003	Bachmann Acela	AMTRAK	Bachma...	Dale Tripp	<input type="checkbox"/>

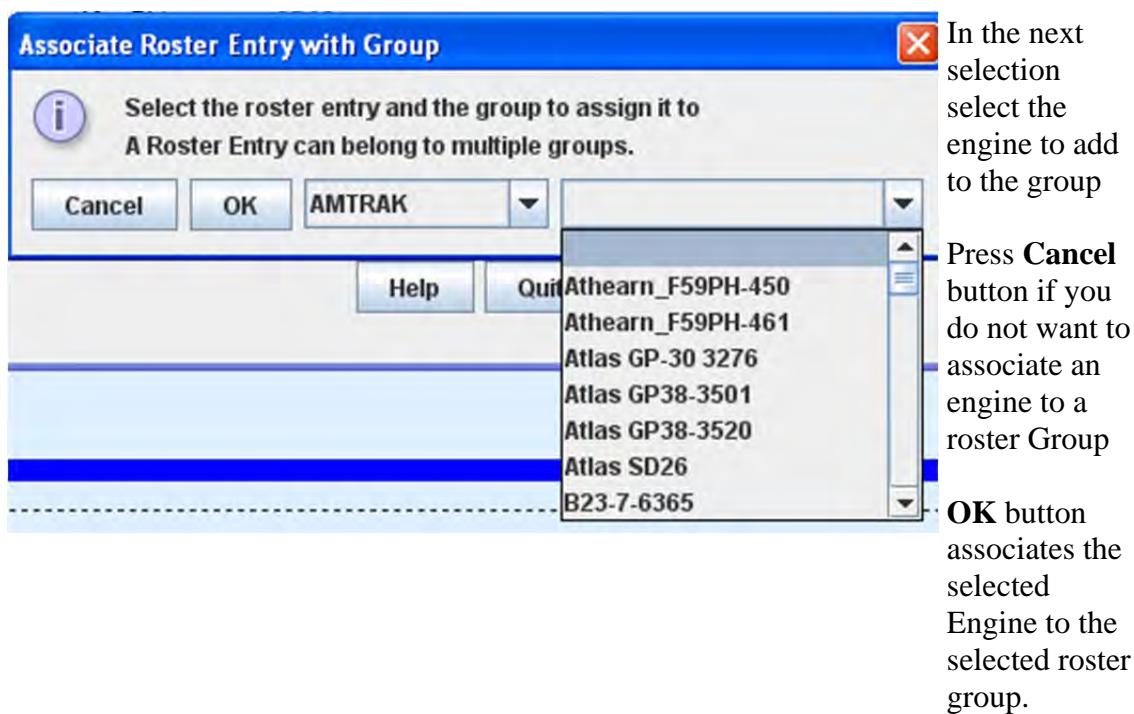
Select Roster Group: the roster group that you want to add entries to.

The table shows all the engines in your roster.

In the right column, Add to... select the entries that you wish to add to the Roster Group, click individually to select a single item, hold the shift key down to select a range of items, hold the CNTRL key down to randomly select items. Close the Table and the entries will be added to the group.

## ASSOCIATE ROSTER ENTRY TO GROUP

Opens the **Associate Roster Entry** dialog with Group which allow you to select individual items.



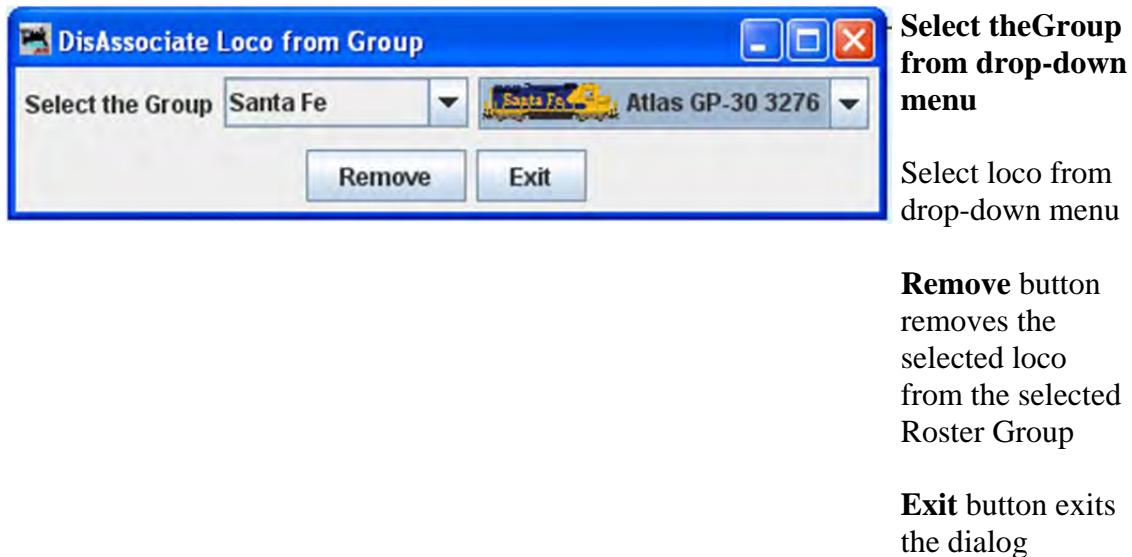
Once the associations have been made, then you can select the Active Roster Group. Once this is done then the Print and Print Summary actions will show only the roster entries associated with that group. As an example you could select the Group **Santa Fe** and only the roster entries in this Roster Group will be printed. The printout does not currently show the active group in the header. The active group will also influence any drop down box which has a list of entries in it, such as Throttle, edit entry, copy, etc. Also, when adding a new roster entry it will automatically be associated with the currently active group, so it is good practice when finishing working with a group to return the active group to Global.

## RESTORING ROSTER TO INCLUDE ALL ENGINES

TO RETURN YOUR ROSTER TO SHOW ALL ENGINES, **SET ACTIVE ROSTER GROUP** TO GLOBAL. THEN YOU MAY BE CERTAIN THAT YOU ARE WORKING WITH ALL ENGINES IN YOUR ROSTER.

## DISASSOCIATION OF ROSTER ENTRY TO GROUP

Opens the **DisAssociate Loco from Group** dialog.



## EXPORT COMPLETE ROSTER...

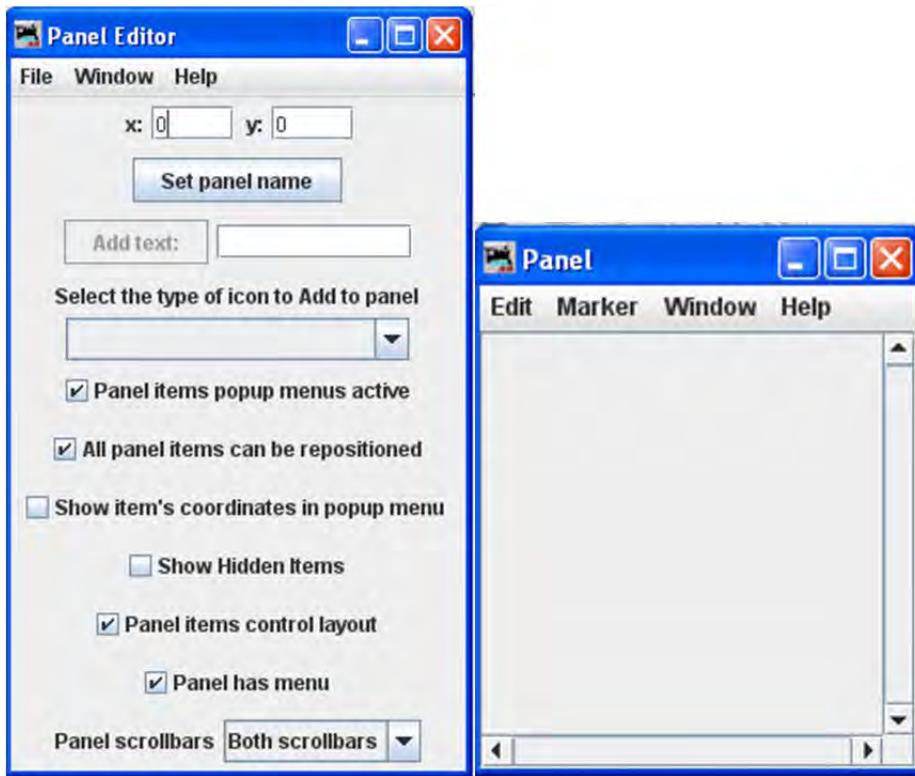
## PANELS MENU

**DecoderPro** is only one facet of the JMRI suite of programs. Another facet is **PanelPro**, which is software that allows you draw a track diagram and then interface the items in that diagram to the electronic hardware on the real layout so that the hardware can be operated via the JMRI Interface. For a tutorial on how to work with PanelPro go to **PanelPro Layout Editor Tutorial**

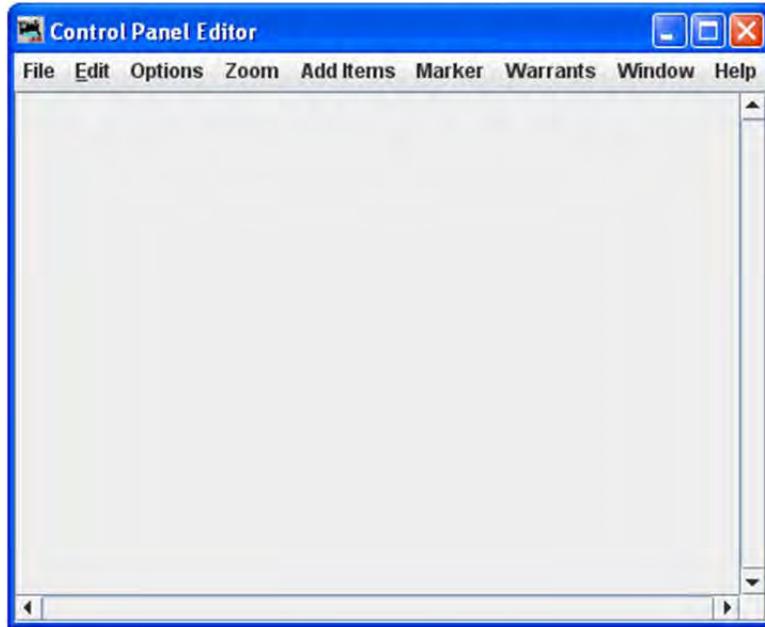
(<http://jmri.org/community/clinics/NMRA2008/LayoutEditorClinic2008/LayoutEditorClinic.pdf>) and [PanelPro Clinic](#) (pdf and flash video files). The subject of panels is included here only show what is available in the DecoderPro menus with a brief illustration/description of what these menu selections access. They are covered here because there is a Panels menu on the DecoderPro main window that allows access to some of the PanelPro functions.

## NEW PANELS... ►

## PANEL EDITOR



CONTROL PANEL EDITOR



LAYOUT EDITOR

For more information on how to use the Layout Editor  
<http://www.jmri.org/help/en/package/jmri/jmrit/display/LayoutEditor.shtml>

# JMRI® User's Guide Version 2.12



## LOAD PANELS...

The **Open** dialog opens, select the panel file that you would like to load.

## STORE PANELS...

The Save dialog opens, select the location on your computer that you would like to store your panel file.

## HOW HISTORY

Opens untitled window with History of panel operations

## SHOW PANELS ►

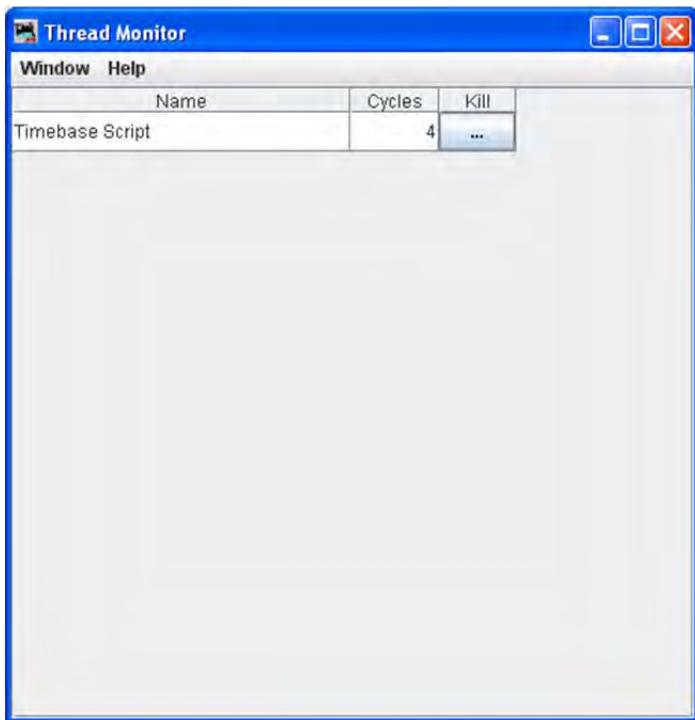
A list of available panels is displayed; select the panel that you would like to display on your desktop window. The selected file will display on your computer.

## RUN SCRIPT...

Opens the **Find desired script file** dialog, you can select the script that you would like to open.

## THREAD MONITOR

Opens the [Thread Monitor](#) pane.



## SCRIPT OUTPUT

Displays the **Script Output** window.

## SCRIPT ENTRY

Displays the **Script Entry** window, in which you may enter scripted function and click on the **Execute** button to execute the script.

## OPERATIONS MENU

Go to Operations Chapter for Operations details

## SETTINGS

Opens the [Operations Setting](#) window.

## LOCATIONS

Opens the [Locations](#) window.

## CARS

Opens the [Cars](#) window.

## LOCOMOTIVES

Opens the [Locomotives](#) window.

## ROUTES

Opens the [Routes](#) window.

## TRAINS

Opens the [Trains](#) window.

### System

(THIS MENU NAME WILL DEPEND UPON THE SYSTEM THAT YOU SELECTED IN PREFERENCES. THE OPTIONS ARE LISTED. IF (NONE) IS SELECTED IN PREFERENCES THIS MENU WILL NOT BE DISPLAYED.)

- [Acela](#)
- [CMRI](#)
- [EasyDCC](#)
- [Grapevine](#)
- [LocoNet](#)
- [NCE](#)
- [OakTreeSystems](#)
- [Powerline](#)
- [QSI](#)
- [RPS](#)
- [SECSI](#)
- [SPROG](#)
- [TMCC](#)
- [wangrow](#)
- [XpressNet](#)
- [Zimo](#)

## ACELA MENU

## COMMAND MONITOR

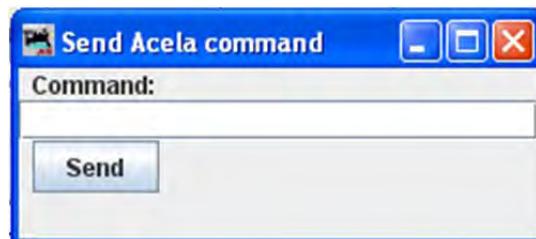
# JMRI® User's Guide Version 2.12

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Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

## SEND COMMAND

Opens the **Send Acela command** prompt, type in your command and click on **Send** button to execute the command.



## CONFIGURE NODES

Opens the Configure Nodes window. This tool facilitates configuring the Acela network nodes.



## CMRI MENU

### CMRI MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMMAND

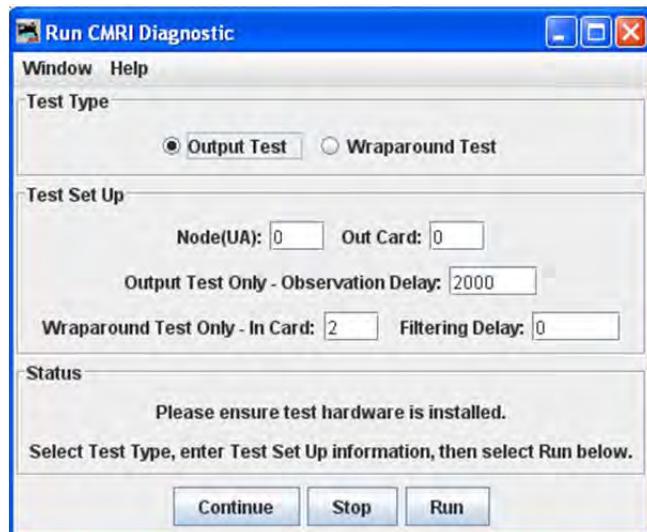
Opens the **Send CMRI serial command** prompt. You may poll devices on the CMRI serial link, using the **Send poll** button. You can send a command to the device using the **Command:** text box and the **Send** button.



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### RUN DIAGNOSTICS

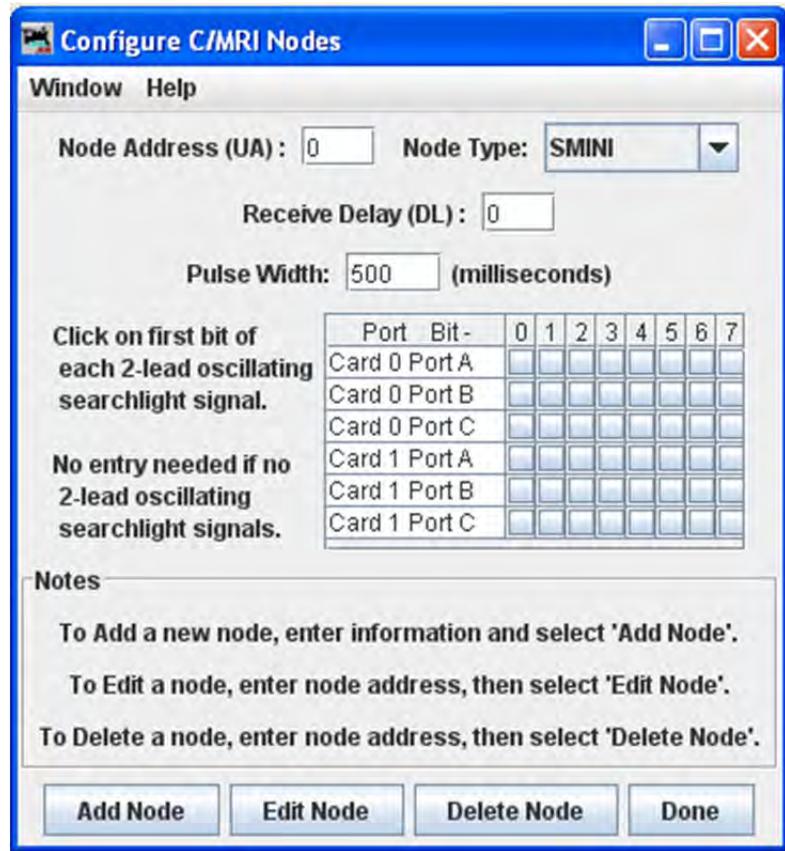
Provides a tool for testing your CMRI serial cards in the system using either an Output Test or a Wraparound Test.



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### CONFIGURE C/MRI NODES

Tool allows you to configure your C/MRI system Nodes.



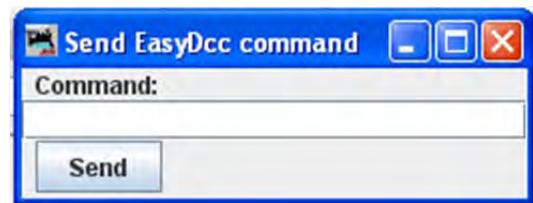
## EASYDCC MENU

### COMMAND MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMMAND

Opens the Send EasyDcc command prompt, which is used to send commands using DecoderPro.



## GRAPEVINE MENU

### COMMUNICATIONS MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

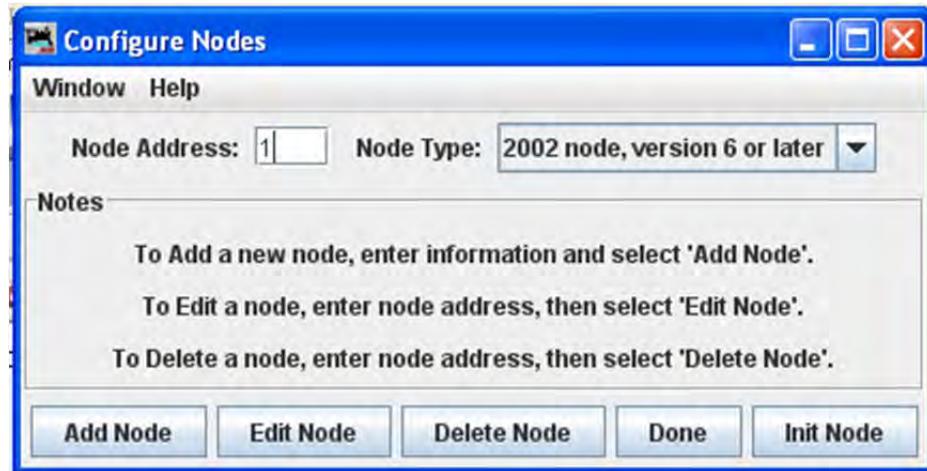
## SEND COMMAND

Opens **Send Grapevine serial command** prompt. Type **Command** and click the **Send** button to send the command via serial Bus. Type node **Address** and click on **Query Node** button to query the Grapevine serial bus node.



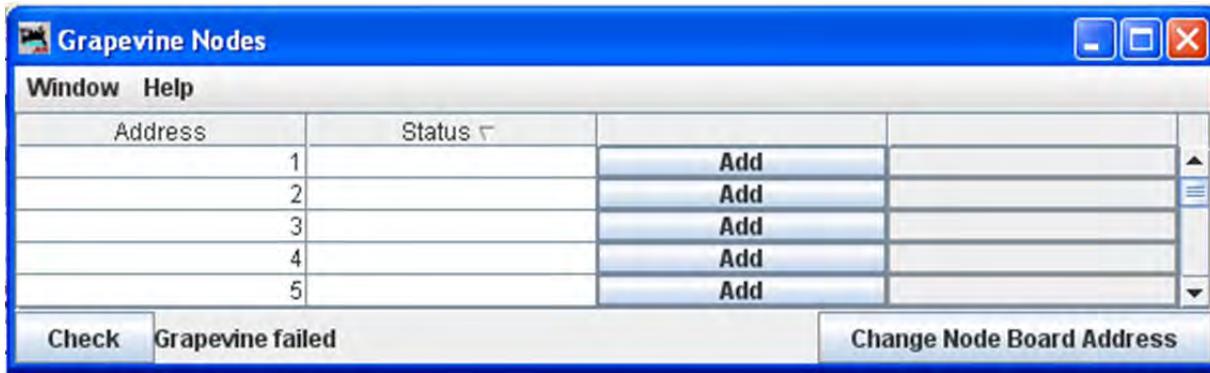
## CONFIGURE NODES

Opens **Configure Nodes** window, which provides the tools for setting the Grapevine Serial Bus nodes.



## NODE TABLE

Opens **Grapevine Nodes** window which displays a table of the nodes.



## LOCONET MENU

### MONITOR LOCONET

Opens the [Monitor LocoNet Window\(Generic Communications Monitor Window\)](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### MONITOR SLOTS

Slots are used to control individual locomotive and consists. The display includes the decoder's speed step format, current speed and function settings, consist information and status. You may choose to show all slots or just the ones being actively used.



The checkboxes at the top allow to select what slots are displayed.

**Show unused slots**

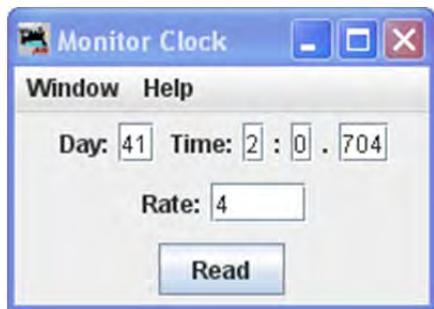
**Show system slots**

Executes an **Emergency Stop** for all locomotives.

The columns are:

Column	Displays	
Slot	The number of the slot	
Address	Locomotive address the slot controls	
Speed	For unconsisted locomotives and addresses that are at the top of a consist, this is the current speed setting. It is an internal value for consisted slots.	
Decoder Type	The format of the commands being sent to the decoder, typically, either 128 step or 28 step, though other values are possible.	
Status	One of the four possible states:  Free      Not reserved for any particular use, no contents Idle      Not reserved for any particular use, no contents Common    Not in use at the moment, but still contains valid data for the last decoder to use it. In Use     Currently controlling a decoder	
Consisted	Displays the consist status of the slot, whether it is not consisted, the top of a consist, included in a consist, etc.	
Throttle ID	The UT4 throttles have a fixed throttle ID. The DT400 has a fixed common leading HEX value and a user programmable second HEX value. . It is displayed as two hexadecimal bytes, see the Digitrax instructions for details.	
Direction	Whether the decoder is currently being commanded to go Forward or Reverse.	
F0-F8	The current function settings	

**MONITOR CLOCK** A DIGITRAX LOCONET CAN CONTAIN IT'S OWN FAST CLOCK TIMEBASE. THIS CAN BE DRIVEN EITHER BY A DCS100/DCS200 COMMAND STATION, OR BY A SEPARATE FAST CLOCK MODULE SUCH AS THOSE MADE BY LOGIC RAIL TECHNOLOGIES.



The **Clock Monitor** tool provides a convenient way to:

- the current contents of the LocoNet fast clock

- Set the **Day** and **Time**
- Set the **Rate**. Note that you can't explicitly pause a LocoNet clock, but you can stop it by setting the rate to zero.

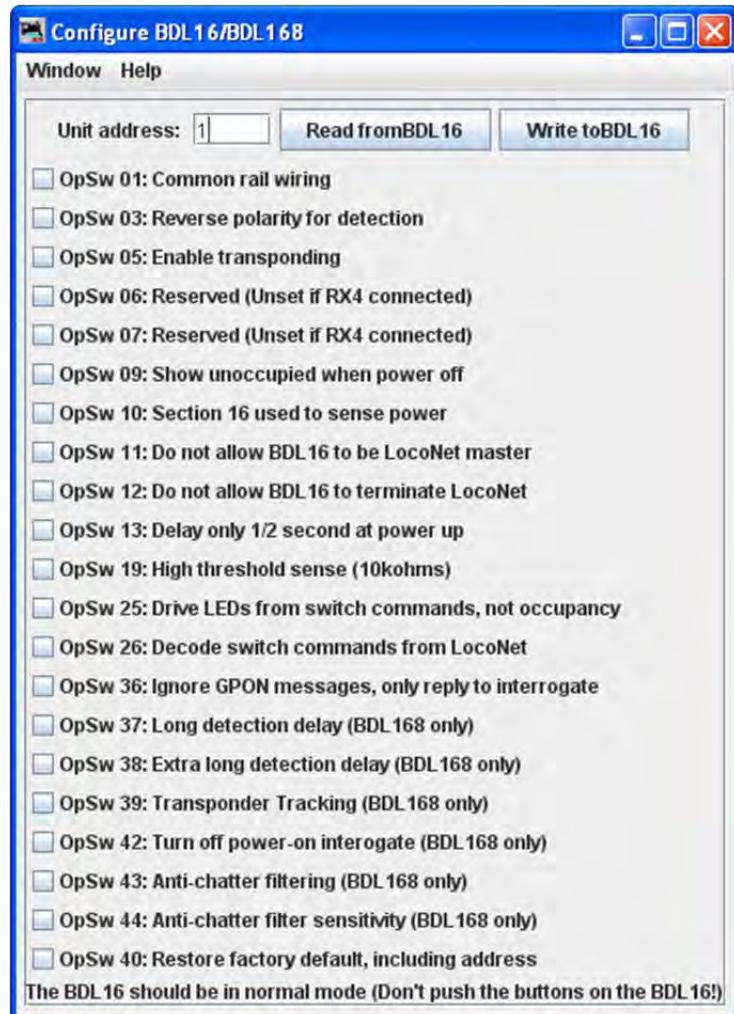
If you are using a DCS100 or DCS200 command station to create your LocoNet fast clock, you may have noticed that it doesn't keep particularly good time. If you select the "Correct LocoNet Fast Clock Master", JMRI will adjust the rate of the LocoNet clock so that it keeps better time.

## MONITOR LOCONET STATS

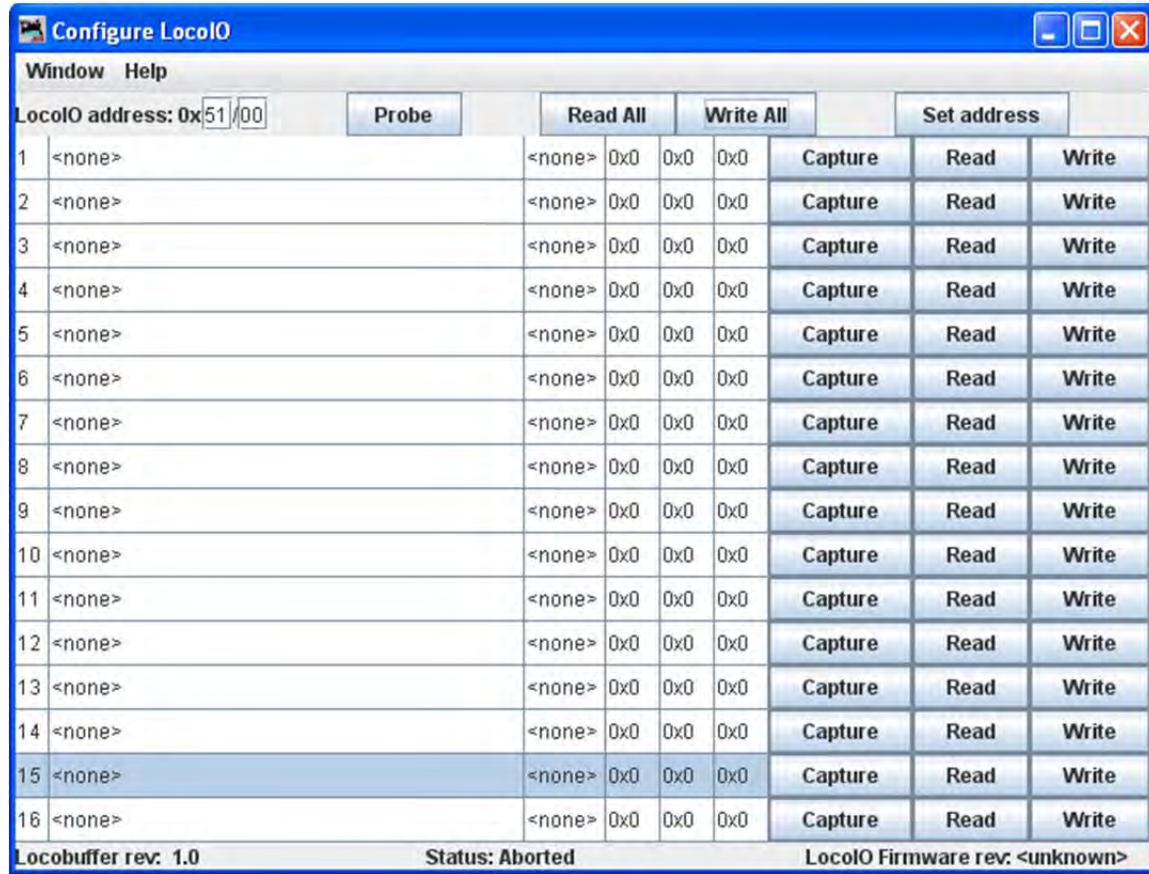
If active it will display the statistics related to traffic on the LocoNet Monitor **LocoNet Stats** Window.

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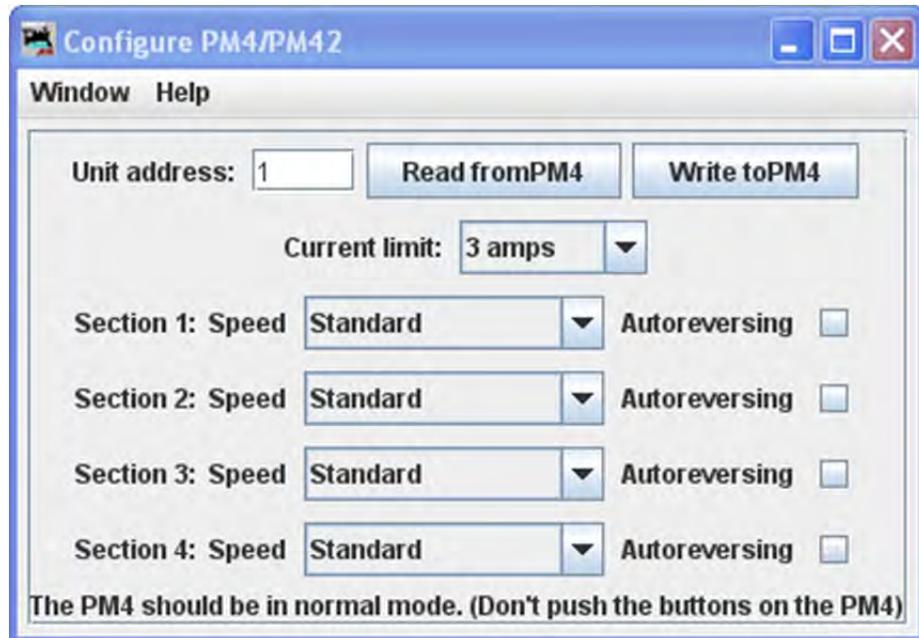
## CONFIGURE BDL16/BDL168



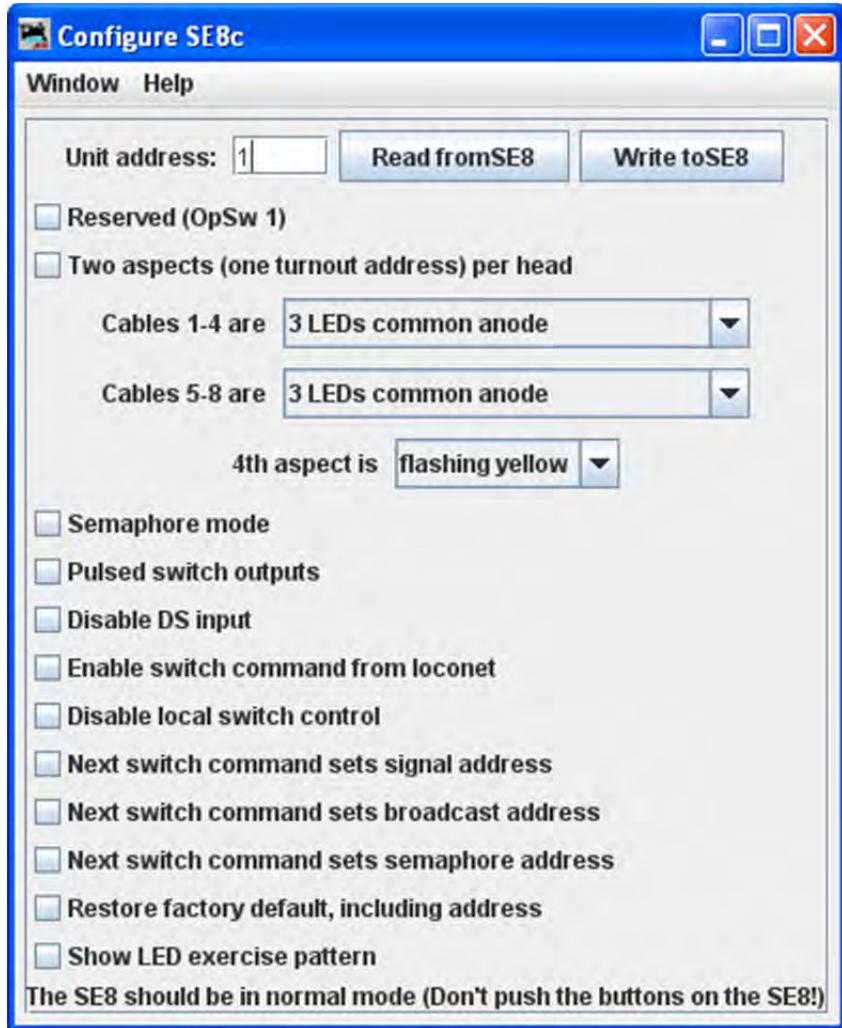
## CONFIGURE LocoIO



## CONFIGURE PM4/PM42



## CONFIGURE SE8C



## CONFIGURE DS64

The DS64 programming tool lets you configure the internal options of a DS64 directly from your computer.

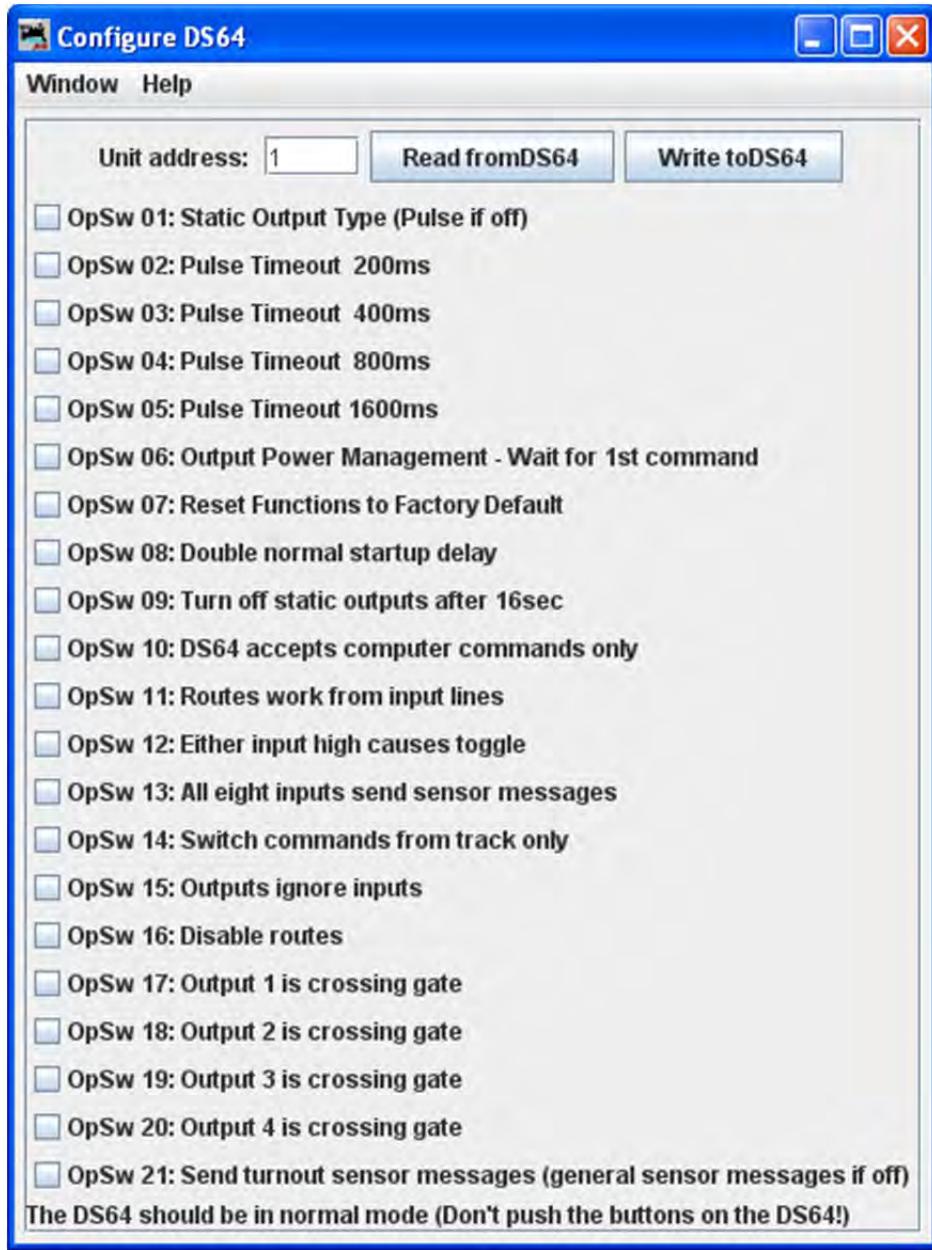
Type the address of a DS64 board in the text field and click . The tool will read back the current state of the various options, and set the check boxes to correspond to their current values.

You can then, if you wish, change the checkboxes and click to make your changes permanent.

## LIMITATIONS

Because of the way the DS64 board works, this tool can't change the basic address of the unit.

At present, DS64 routes cannot be programmed by this tool. It's possible, but nobody has written the code for it yet because JMRI routes are more powerful and easier to use.

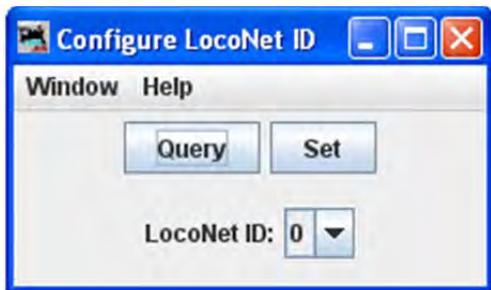


## CONFIGURE COMMAND STATION

Opens the Configure Command Station window

## CONFIGURE LOCONET ID

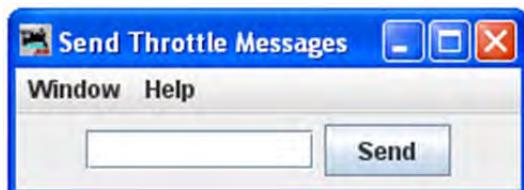
Opens the **Configure LocoNet ID** dialog that allows you to set the LocoNet ID **Value**:



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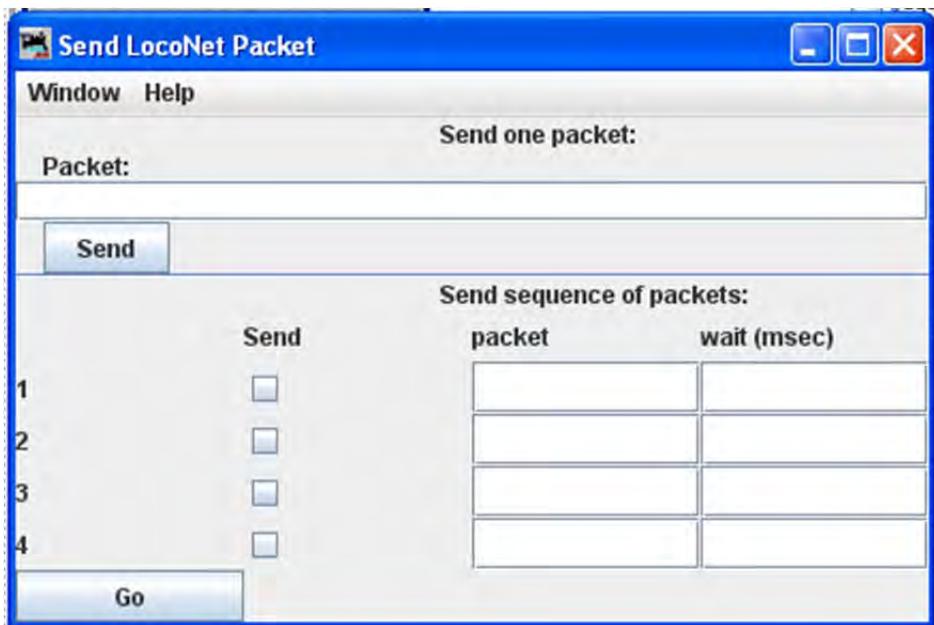
## SEND THROTTLE MESSAGES

Opens **Throttle message** prompt with limited capability to send messages to handheld throttle.



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## SEND LOCONET PACKET



LocoNet packets are sent in raw hexadecimal format, you may use the [Monitor Window](#) in the **Show Raw Data** option to monitor the packets.

The top section lets you send a single LocoNet packet. Type the hexadecimal numbers and click , you should include the byte for the checksum at the end of the message.

The bottom section lets you enter from one to four packets that will be repeatedly sent in sequence, with the user-defined delays in between. Press the to start transmission sequence, and press again to stop the sequence.

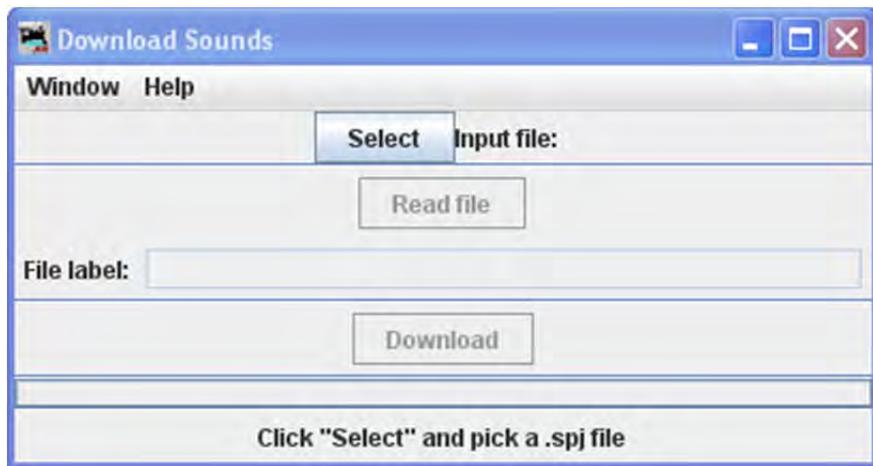
## **SELECT PR3 MODE**

Opens the **Select PR3 Mode** dialog.



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## **DOWNLOAD FIRMWARE**



Digitrax sound decoders are loaded with "sound projects", stored in "Sound Project" (.spj) files. Those contain a number of "sound fragments" in .wav format, plus some additional control information.

The Decoder Sound Downloader tool lets you load a new .spj file into a Digitrax sound decoder via a Digitrax PR2 or PR3 interface. If you're using a PR3, it needs to be put into "Programmer mode" before trying to download, see the main [PR3 page](#).

Digitrax provides sample sound project files at their Sound Depot (<http://www.digitrax.com/sounddepot.php>) web site. You can also find links to documentation and additional tools there.

JMRI also provides tools for [editing sound project files](#) to include new sounds and even to [change the sound logic](#). When you first select the Download Sounds tool, it opens a dialog with most of the controls disabled:

(Click on any image on this page to see a larger version)

The status line at the bottom will walk you through the steps needed.

1. First, click "Select" and pick the .spj file you want to download.
2. Next, click "Read" to read the file (this is a separate step so you can just click "Read" multiple times if you're editing and saving new versions of the file).

If everything is OK, the file will be read into the program and verified, a version string from the file will be displayed, and the "Download" button will be enabled.

3. Click "Download" to start the download process. It will take a little while. The progress is described in the status line:

"Starting download; erase flash"

The first step is to erase the decoders memory so it can take new data. This will take up to about 30 seconds, depending on the specific decoder.

"Sending initialization message"

Set up the decoder to accept data after being erased. This should only take a fraction of a second.

"Send SDF data"

Load the Sound Definition data into the decoder, which should only take a few seconds

"Send WAV data"

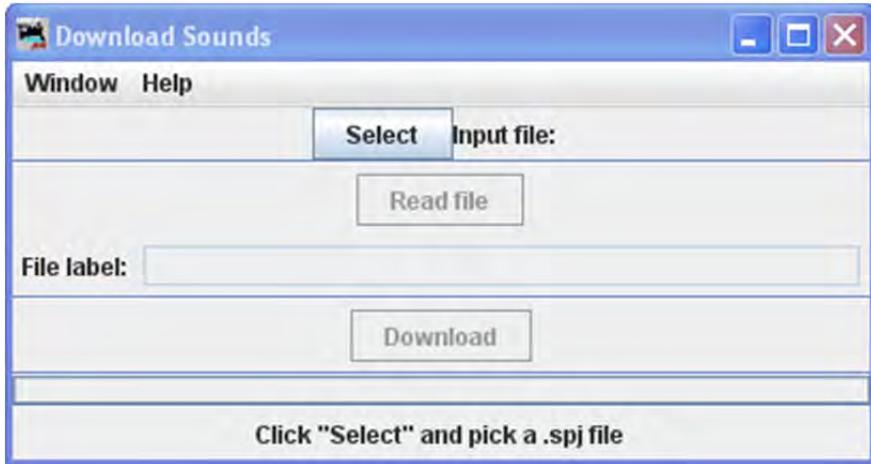
The sound data is being downloaded. As each block is sent you'll get an update: "Send WAV data block 1", then 2, then 3, etc.

"Done"

The download completed OK.

If something goes wrong, the final status will be "Download aborted". The most common reason is that the PR2 couldn't handle the data that was being send, which is listed as "PR2 not ready". If this happens repeatedly, make sure that the serial port and cable that the PR2 is using as the control lea

## DOWNLOAD SOUNDS



Digitrax sound decoders are loaded with "sound projects", stored in "Sound Project" (.spj) files. Those contain a number of "sound fragments" in .wav format, plus some additional control information.

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"Sending initialization message"

Set up the decoder to accept data after being erased. This should only take a fraction of a second.

"Send SDF data"

Load the Sound Definition data into the decoder, which should only take a few seconds

"Send WAV data"

The sound data is being downloaded. As each block is sent you'll get an update: "Send WAV data block 1", then 2, then 3, etc.

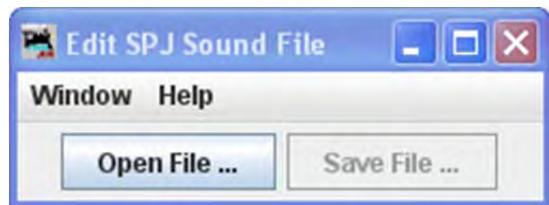
"Done"

The downloadload completed OK.

If something goes wrong, the final status will be "Download aborted". The most common reason is that the PR2 couldn't handle the data that was being send, which is listed as "PR2 not ready". If this happens repeatedly, make sure that the serial port and cable that the PR2 is using as the control lea

## EDIT SPJ SOUND FILE

Opens Sound File editing tool

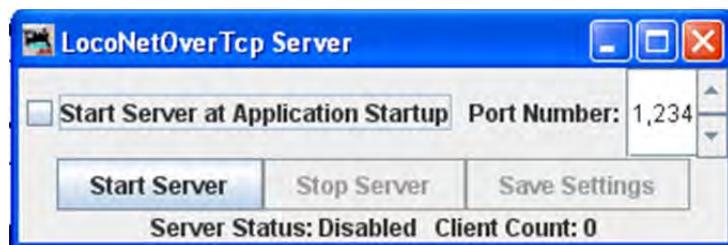


## START LOCONET SERVER

Starts the LocoNet server.

## START LOCONET OVER TCP SERVER

Opens the **LocoNetOver Tcp Server** dialog.



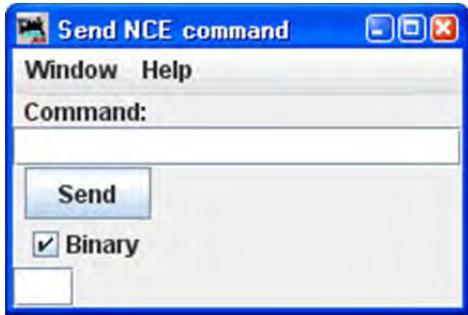
## NCE MENU

## COMMAND MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

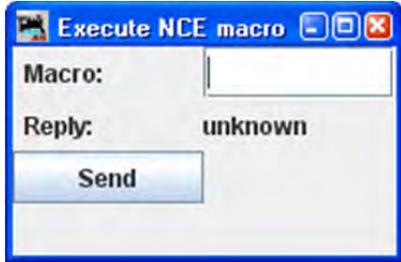
## SEND COMMAND

Opens the **Send** prompt with a text box to enter the NCE Format command that you want to send.



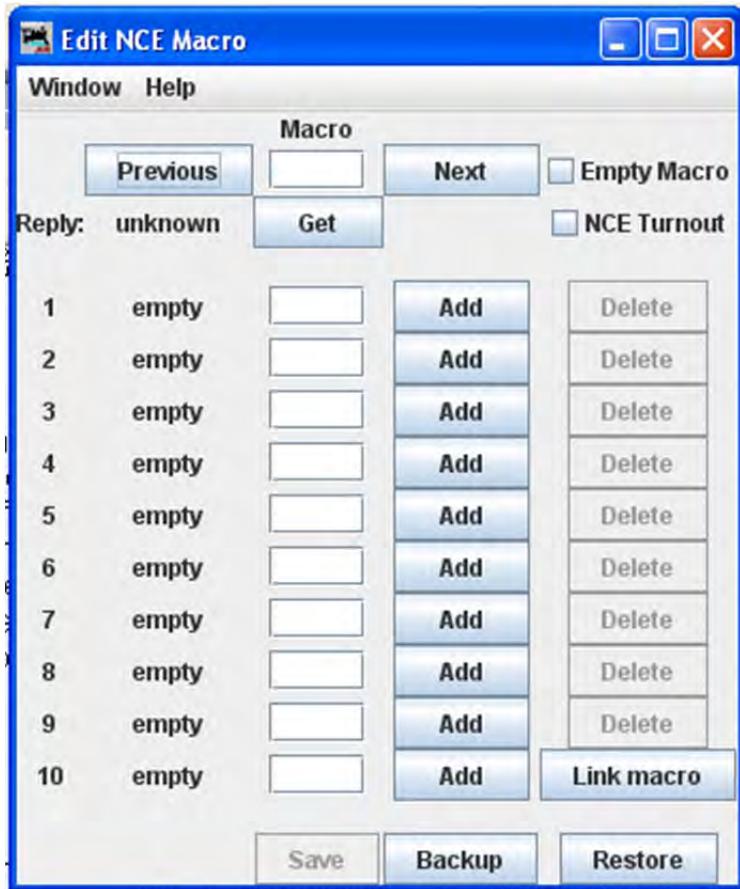
## SEND MACRO

Opens the **Execute NCE Macro** Window which allows you to enter the Macro number to be executed. Clicking the **Send** button sends the macro.



## EDIT MACRO

This tool allows you to review, edit and save NCE style macros. It also allows you to backup and restore all the NCE command station macros to and from a file. The file format is identical to NCE, so you can restore a file that was generated by the NCE backup command. It is recommended that you set the baud rate at 9600 when using this tool.



### Backup button

Click on the **Backup** button located on the bottom row. This will open the **Save** dialog. This will read the NCE command station memory and store the contents into the file you selected.

### Restore button

Click the **Restore** button located on the bottom row. This will display the **Open** dialog, select the file you want to restore to the NCE command stations memory and click on **Open** button.

### Get button

To review a macro, enter the number of the macro in the text box under the heading **Macro** and click the **Get** button. This will retrieve the macro from the command station's memory. If the macro currently exists, **Reply:** will be macro found. If the macro does not exist, the **Reply:** will be macro empty. If there is a macro, the editor will show a list of accessories that the macro is programmed to activate.

### Add button

The **Add** button will add an accessory's address

## Delete button

The **Delete** button will remove an accessory's address

## Link Macro button

Links this macro to another one.

## Previous and Next buttons

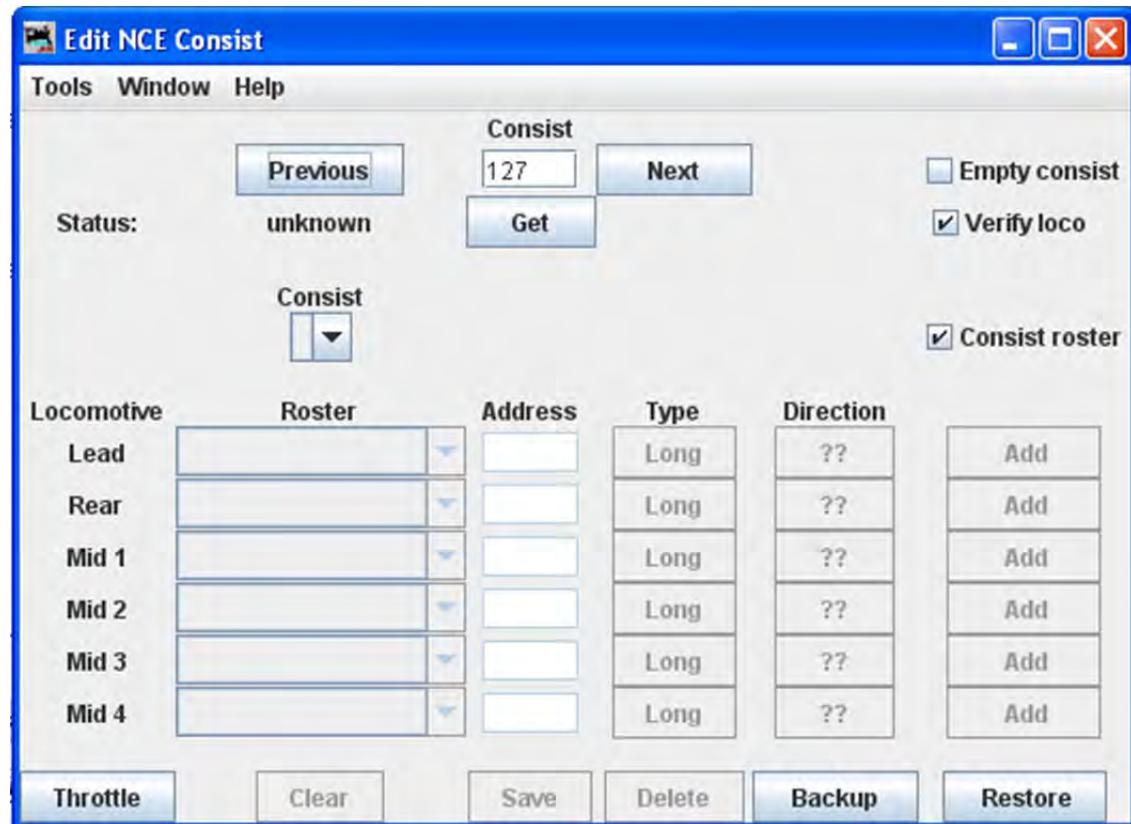
Allow you to search the macros.

## Save button

Saves macros to the NCE command station

## **EDIT CONSIST**

This tool allows you to review, edit and save NCE style consists. Also allows you to backup and restore all the NCE command station consists to and from a file.



**Backup** button allows you to backup all of your consists to a file from the NCE command Station.

**Restore** button allows you restore consists from a file to the NCE command Station.

**Get** button is used to retrieve the consist from the command station's memory.

You may add a locomotive by entering the address and clicking the ?? button to set forward or reverse running. The **Type** button toggles between **Long** and **Short** address (remember that NCE allows both long and short addresses in the range below 128). Click the **Add** button and that locomotive will be added to the consist.

Alternately, you may add a locomotive from your roster with the drop-down list, then click the **Add** button.

**Consist roster** enables saving and maintaining consist roster when checked.

**Save and Load** Button is displayed as a **Save** button when program has detected that a change has been made to a consist. When you select a consist to load from the consist menu, it becomes the **Load** button.

**Clear** button removes all the locomotives from a consist.

## DCC PACKET ANALYZER

The DCC packet analyzer entry is software to log data from a hardware device sold by NCE which allows the user to observe the packets on the NCE Command Bus, or alternatively directly from the track. The latter feature allows the device to look at track packets sent from any Command Station that conforms to the NMRA standard (such as Digitrax or Lenz). The input signal is interpreted and sent to JMRI through a serial interface. With it the user can see speed and function instructions being sent from the Command Station to the decoder

## Monitor Clock

Opens the [NCE Clock Monitor](#) window. When the clock is running as clock master mode, the internal clock rate is adjusted to match time with the NCE command station clock. The goal is the minute should roll over at the same time for the internal clock and ProCab displays.

## Show Cabs

Opens a window that displays the cabs currently on the system. This is handy for determining the cab number assigned to a throttle that doesn't have a display. Just use "Show Cabs" to display the cabs currently on the system. Then plug in the cab in question and use it again to see which one is added. If you have a standalone set-up bench it's even easier. Cycle the power to clear the command station memory. Then plug in the new cab and Show Cabs will display its number

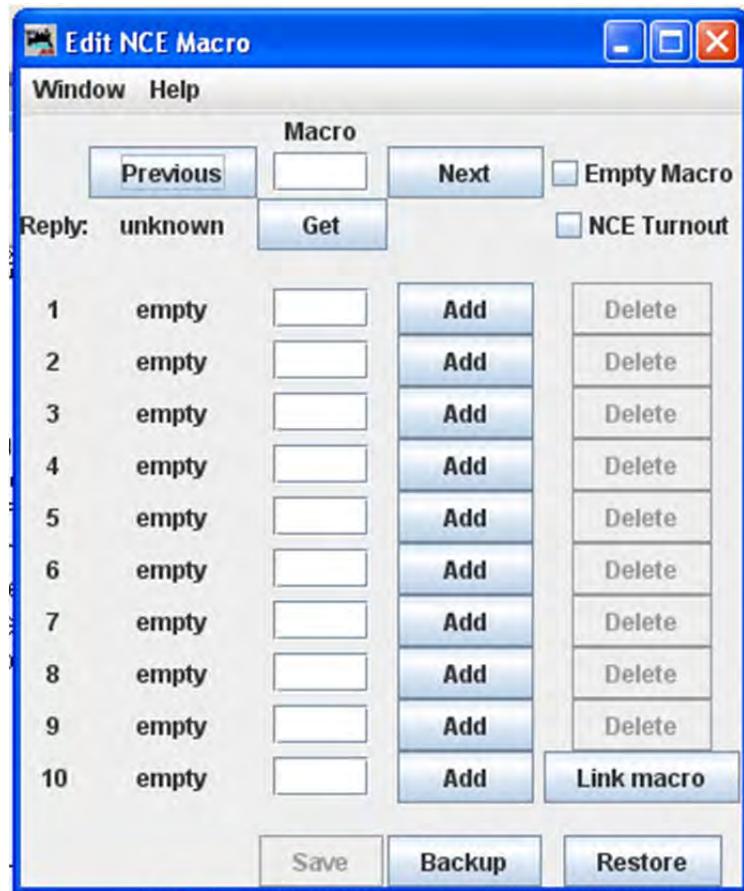
## Booster Programming

Booster Programming is stated to be only for NCE booster testing, and warns that the booster must be disconnected from the track before using.

---

## EDIT NCE MACRO WINDOW

This tool allows you to review, edit and save NCE style macros. It also allows you to backup and restore all the NCE command station macros to and from a file. The file format is identical to NCE, so you can restore a file that was generated by the NCE backup command. It is recommended that you set the baud rate at 9600 when using this tool.



### Backup button

Click on the **Backup** button located on the bottom row. This will open the **Save** dialog. This will read the NCE command station memory and store the contents into the file you selected.

### Restore button

Click the **Restore** button located on the bottom row. This will display the **Open** dialog, select the file you want to restore to the NCE command stations memory and click on **Open** button.

## Get button

To review a macro, enter the number of the macro in the text box under the heading **Macro** and click the **Get** button. This will retrieve the macro from the command station's memory. If the the macro currently exists, **Reply:** will be macro found. If the macro does not exist, the **Reply:** will be macro empty. If there is a macro, the editor will show a list of accessories that the macro is programmed to activate.

## Add button

The **Add** button will add an accessory's address

## Delete button

The **Delete** button will remove an accessory's address

## Link Macro button

Links this macro to another one.

## Previous and Next buttons

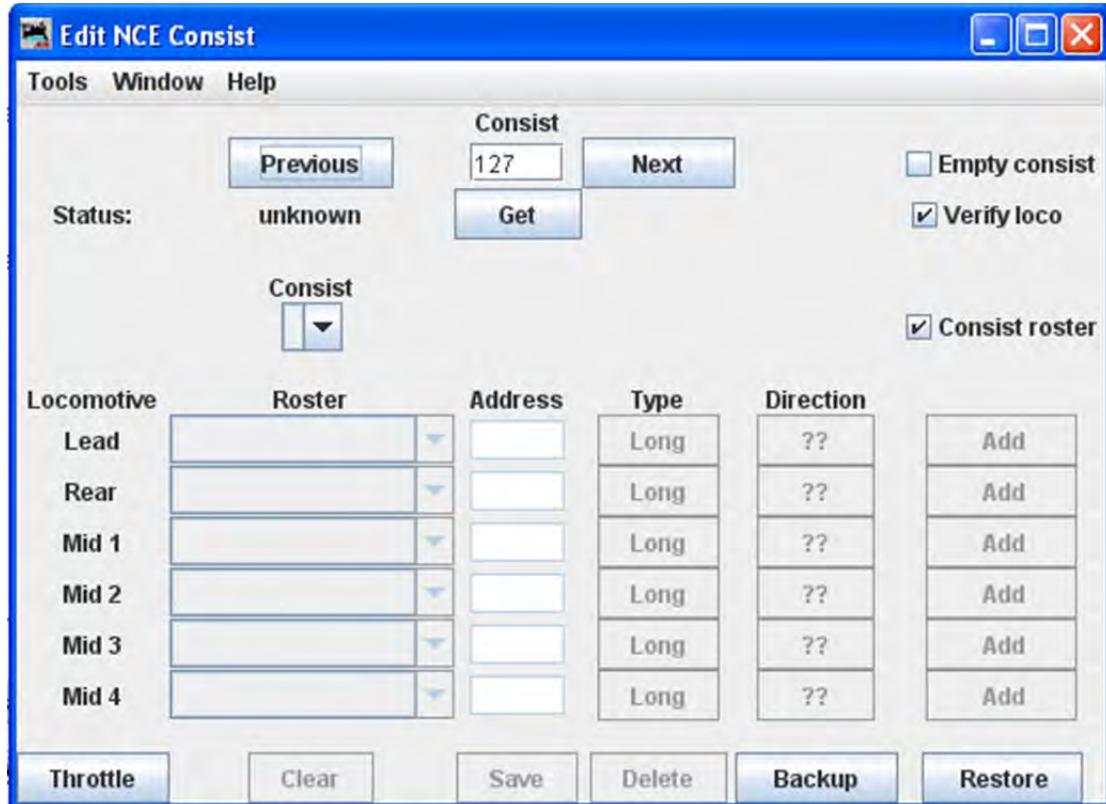
Allow you to search the macros.

## Save button

Saves macros to the NCE command station

## EDIT CONSIST WINDOW

This tool allows you to review, edit and save NCE style consists. Also allows you to backup and restore all the NCE command station consists to and from a file.



**Backup** button allows you to backup all of your consists to a file from the NCE command Station.

**Restore** button allows you restore consists from a file to the NCE command Station.

**Get** button is used to retrieve the consist from the command station's memory.

You may add a locomotive by entering the address and clicking the **??** button to set forward or reverse running. The **Type** button toggles between **Long** and **Short** address (remember that NCE allows both long and short addresses in the range below 128). Click the **Add** button and that locomotive will be added to the consist.

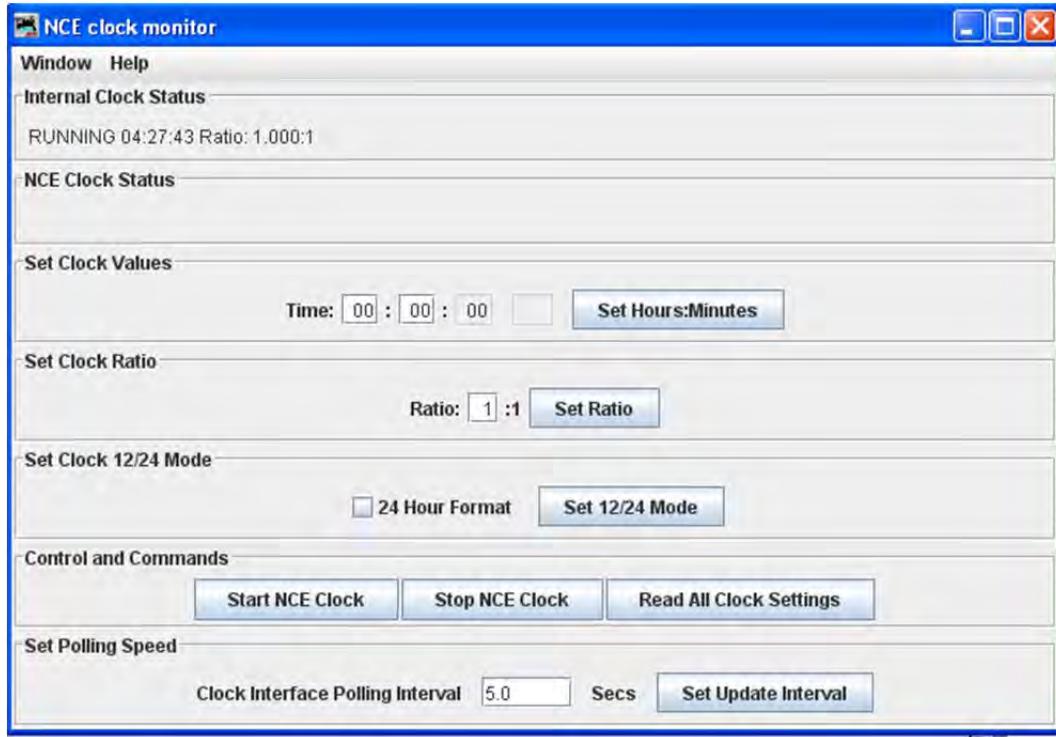
Alternately, you may add a locomotive from your roster with the drop-down list, then click the **Add** button.

**Consist roster** enables saving and maintaining consist roster when checked.

**Save** and **Load** Button is displayed as a **Save** button when program has detected that a change has been made to a consist. When you select a consist to load from the consist menu, it becomes the **Load** button.

**Clear** button removes all the locomotives from a consist.

## NCE CLOCK MONITOR WINDOW



## OAKTREESYSTEMS MENU

### COMMUNICATIONS MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMMAND

Opens the Send Oak Tree serial command prompt, which will allow you to type in a **Command:** then click on . You may also type in an **Address:** and poll the system by clicking on the .



## POWERLINE MENU

### COMMUNICATIONS MONITOR

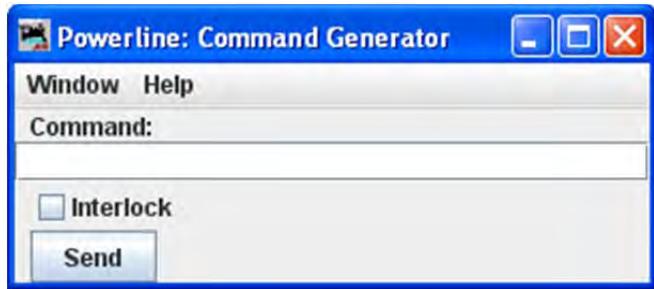
# JMRI® User's Guide Version 2.12

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Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

## SEND COMMAND

Opens the **Send power line device command** prompt to allow you to type in a **Command** and it to the powerline device.



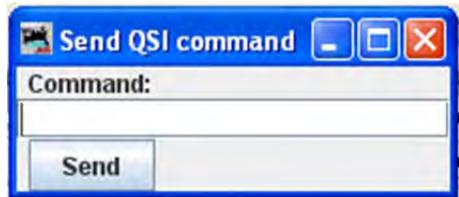
## QSI MENU

### Command Monitor

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

## SEND COMMAND

Opens the **Send QSI command** prompt to type in a **Command:** and click on .



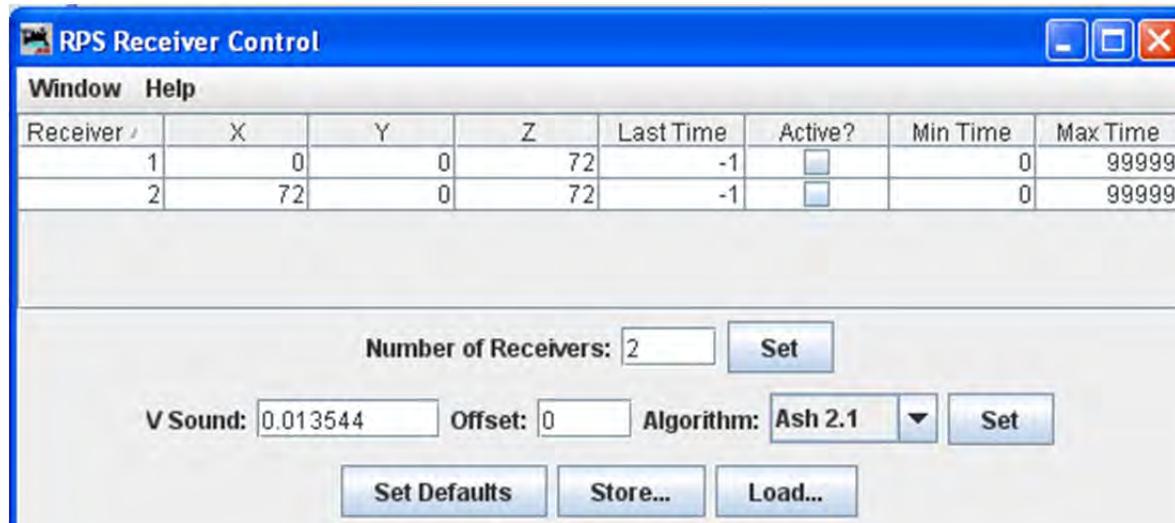
## RPS MENU

### RPS MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

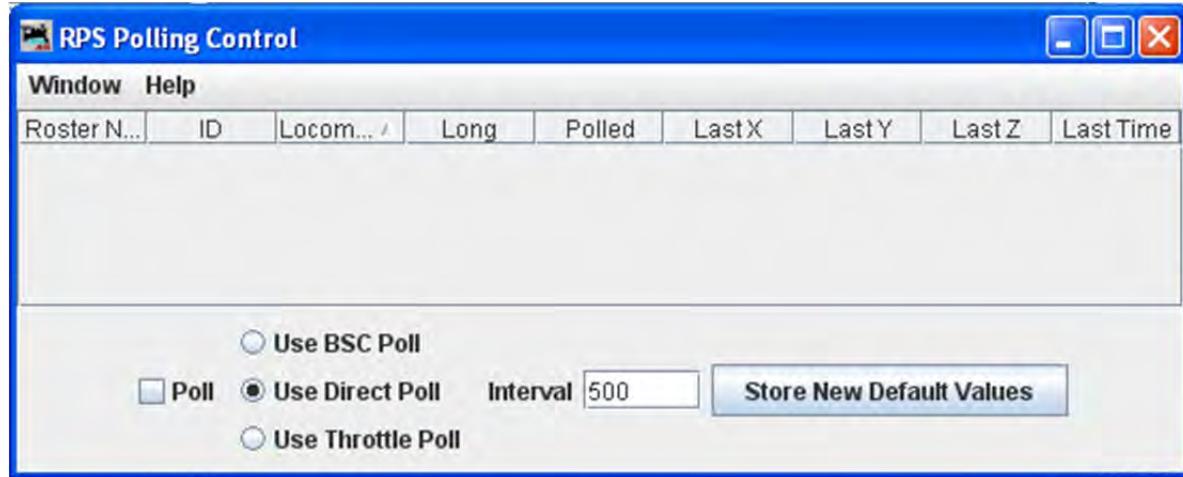
### RPS RECEIVER CONTROL

Opens the [RPS Receiver Control](#) window, which will detect how many receivers it has and set up a table with the right number of rows.



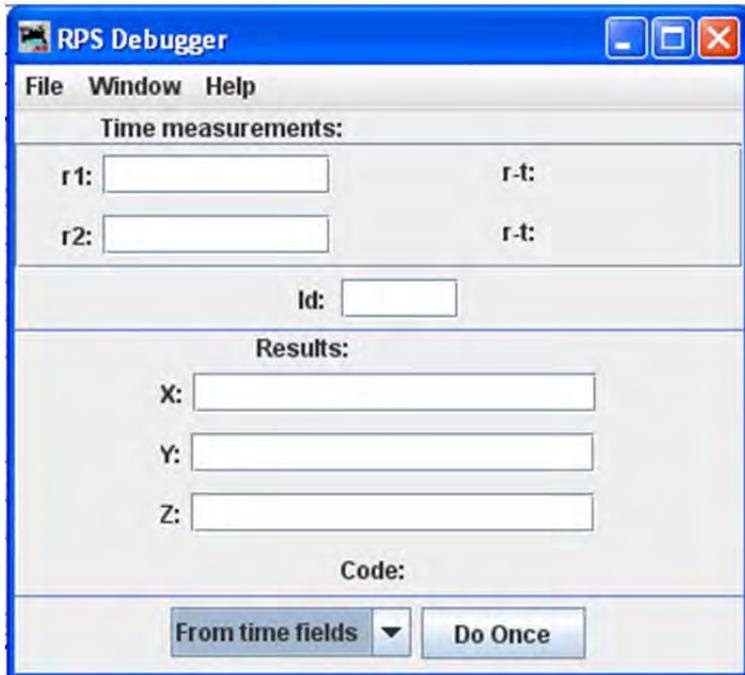
## RPS POLLING CONTROL

Opens the [RPS Polling Control](#) window where you tell the RPS system which of your locomotives have RPS transmitters installed, and how often to talk to them.



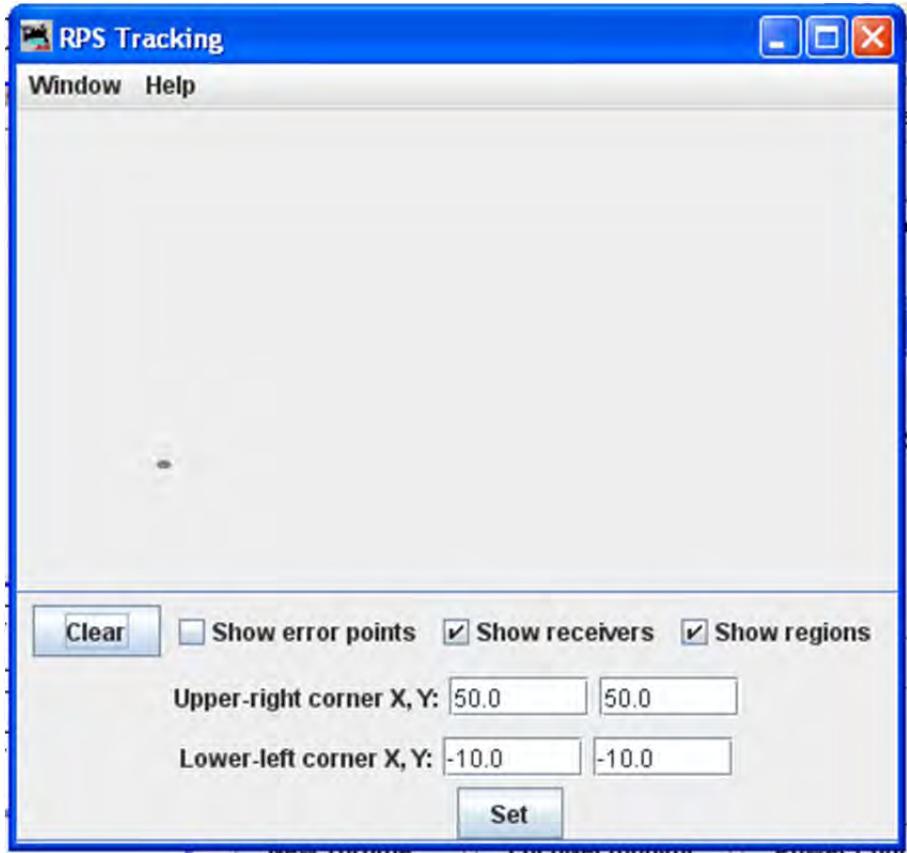
## RPS DEBUGGING WINDOW

Opens the [RPS Debugger](#) window that lets you look at information as it moves through the RPS system.



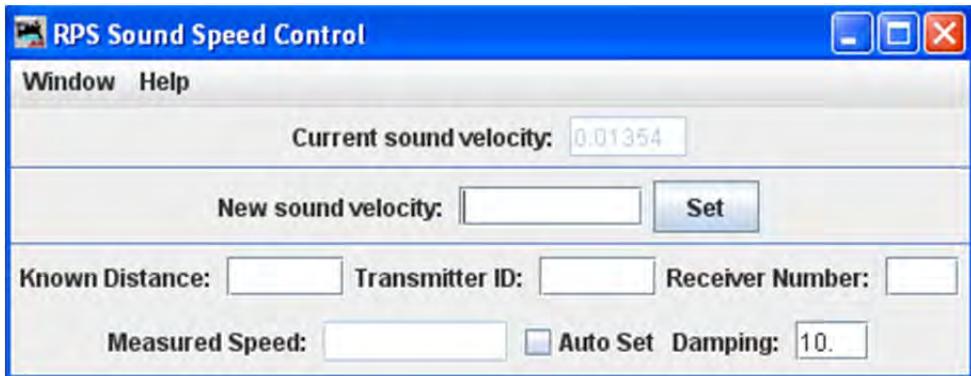
## RPS TRACKING DISPLAY

Opens the [RPS Tracking](#) frame that displays two types of things, the measured positions and paths of RPS transmitters and the ***detection regions*** used for RPS blocks and sensors.



## RPS SOUND SPEED MONITOR

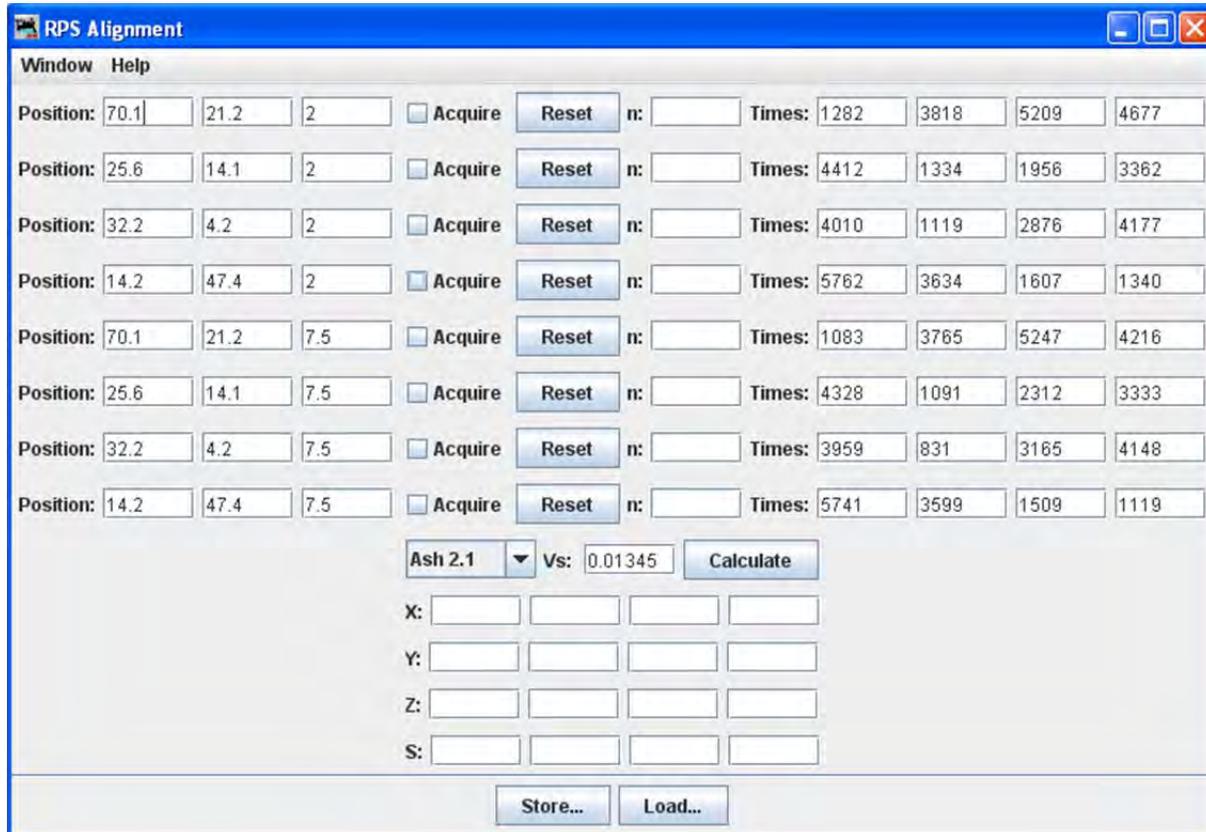
Opens the [RPS Sound Speed Control](#) window that lets you monitor and control the speed of sound used by the RPS system.



---

## RPS ALIGNMENT TOOL

Open the [RPS Alignment](#) window that allows you to align the sensors.



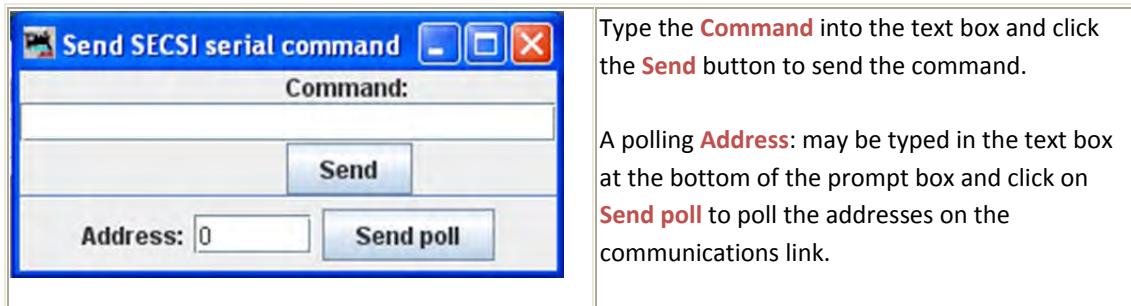
## SECSI MENU

### COMMUNICATIONS MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMMAND

The [Send SECSI serial command](#) prompt opens.



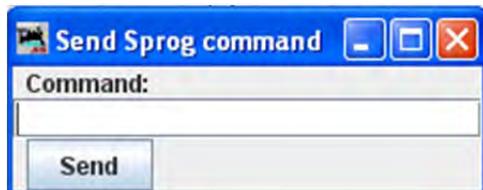
## SPROG MENU

### COMMAND MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMAMND

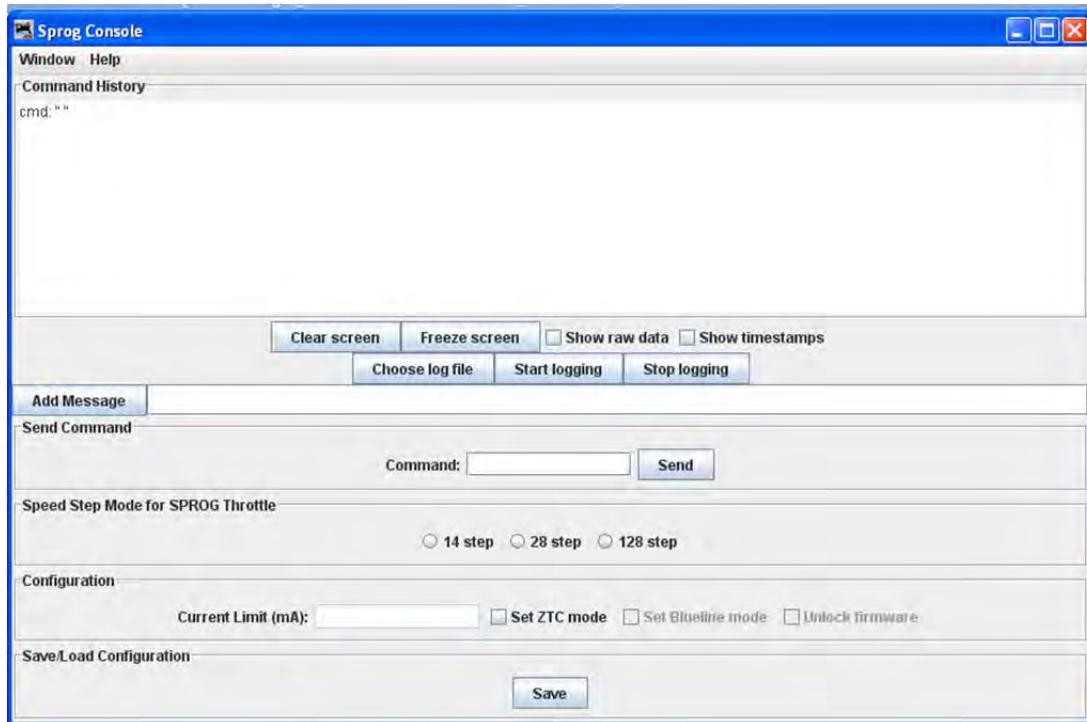
Opens the Send prompt with a text box to enter the **Command** message that will be sent to the DCC system when you click on the **Send** button.



### CONSOLE

Opens the [Sprog Console](#) window that combines the communications monitor, Send Command and other features into a single user interface.

The Console combines the Communications Monitor, Send Command and other features into a single interface.



## GET SPROG FIRMWARE VERSION

Retrieves the SPROG firmware version and displays that information.

## SPROG V3/V4 FIRMWARE UPDATE

Starts the SPROG Firmware Update wizard.

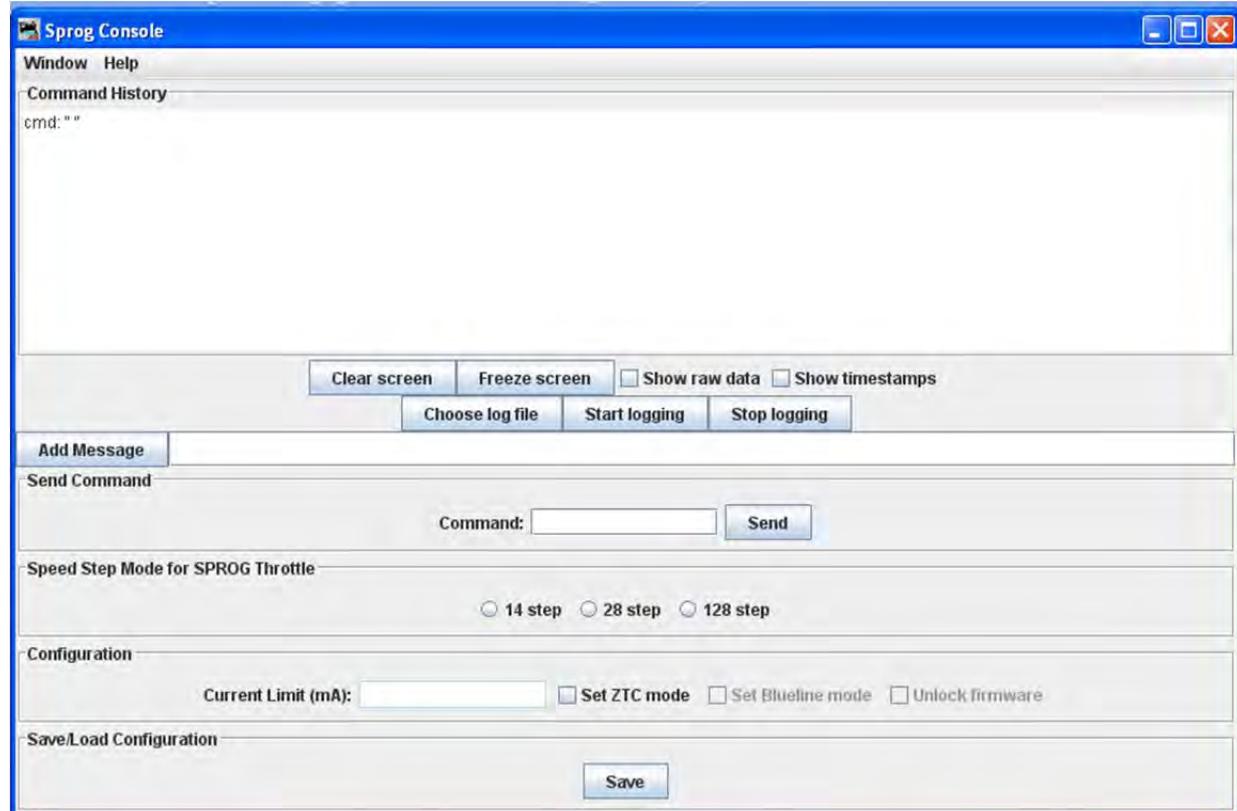


## SPROG II FIRMWARE UPDATE

Starts the SPROG II Firmware Update Wizard (basically the same as above)

## SPROG CONSOLE

The Console combines the Communications Monitor, Send Command and other features into a single interface.



## TMCC MENU

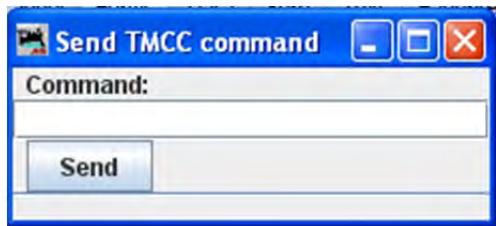
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## TMCC MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

## SEND COMMAND

Opens the Send TMCC command prompt to send a command to the DCC system by typing in the **Command** text box and clicking the **Send** button to send the command.



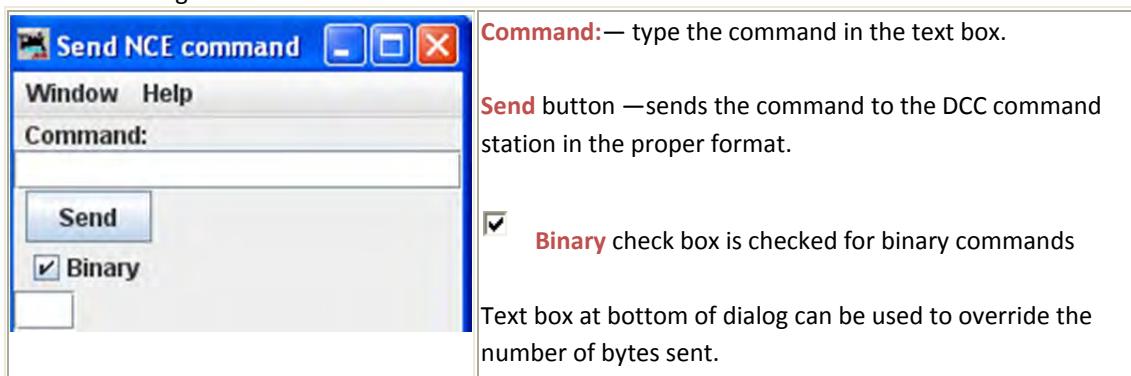
## WANGROW MENU

### COMMAND MONITOR

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMMAND

Opens the NCE Command Generator, Whose binary commands are designed to work in a computer friendly mode.  
Command format (cmd number) (data) (data) ...  
Commands range from 0x80 to 0xBF



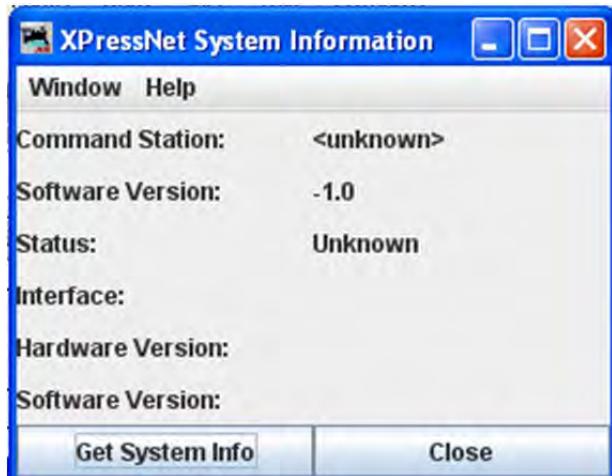
## XPRESSNET MENU

### XPRESSNET MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

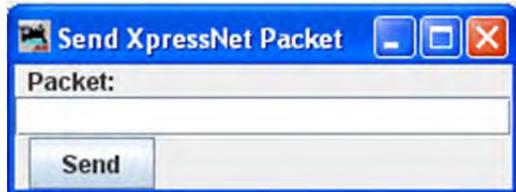
### XPRESSNET SYSTEM INFORMATION

Click on the **Get System Info** button to query the system (Lenz or other) for system information that will be displayed in the dialog. Click on **Close** button to close the dialog.



## SEND XPRESSNET COMMAND

Opens the Send XpressNet Packet prompt so that you can type in a Packet: and click on the **Send** button to transmit via XpressNet to your system.

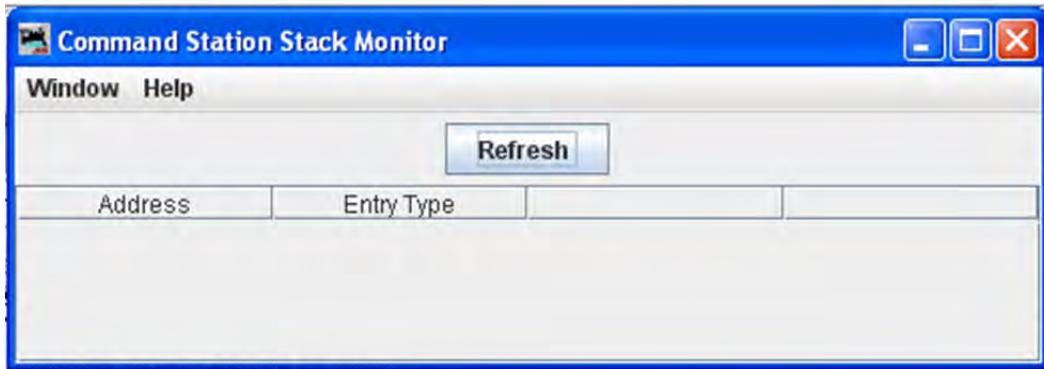


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## COMMAND STATION DATABASE MANAGER

Opens the [Command Station Stack Monitor](#) window that allows you to monitor the status of the command station stack (database).

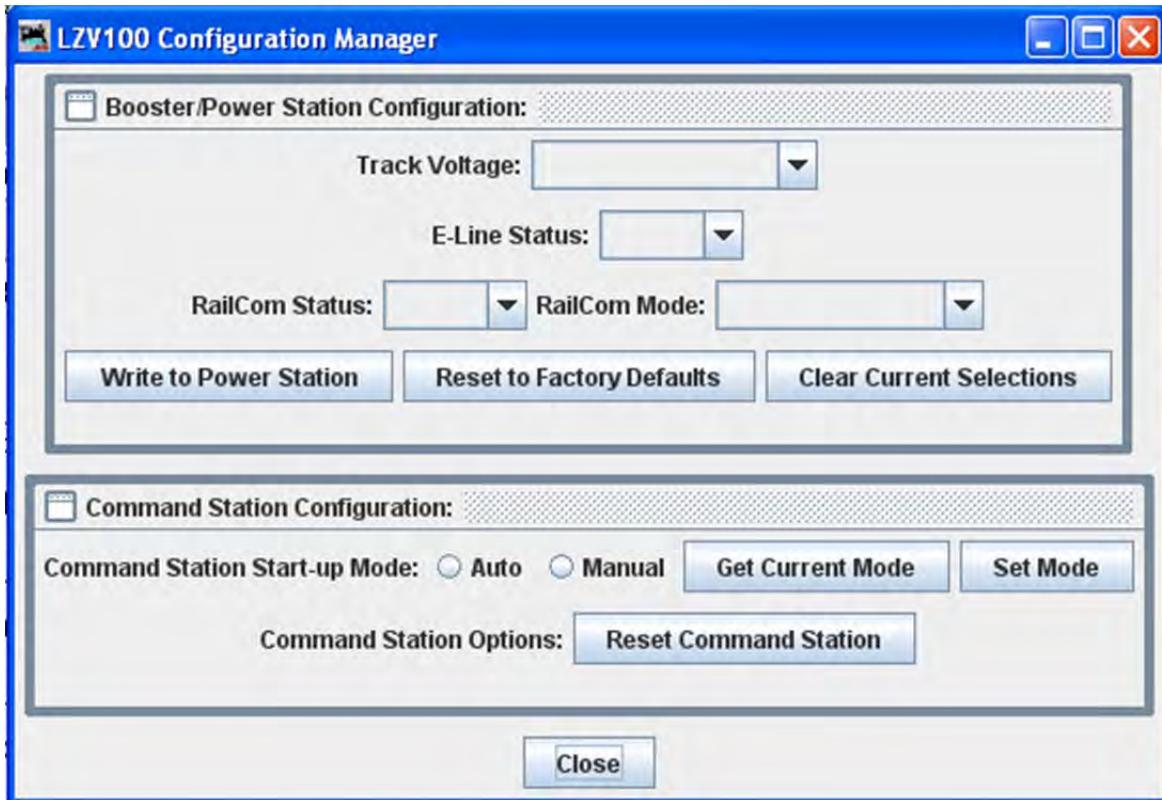
Click the **Refresh** button to update the display to the current information.



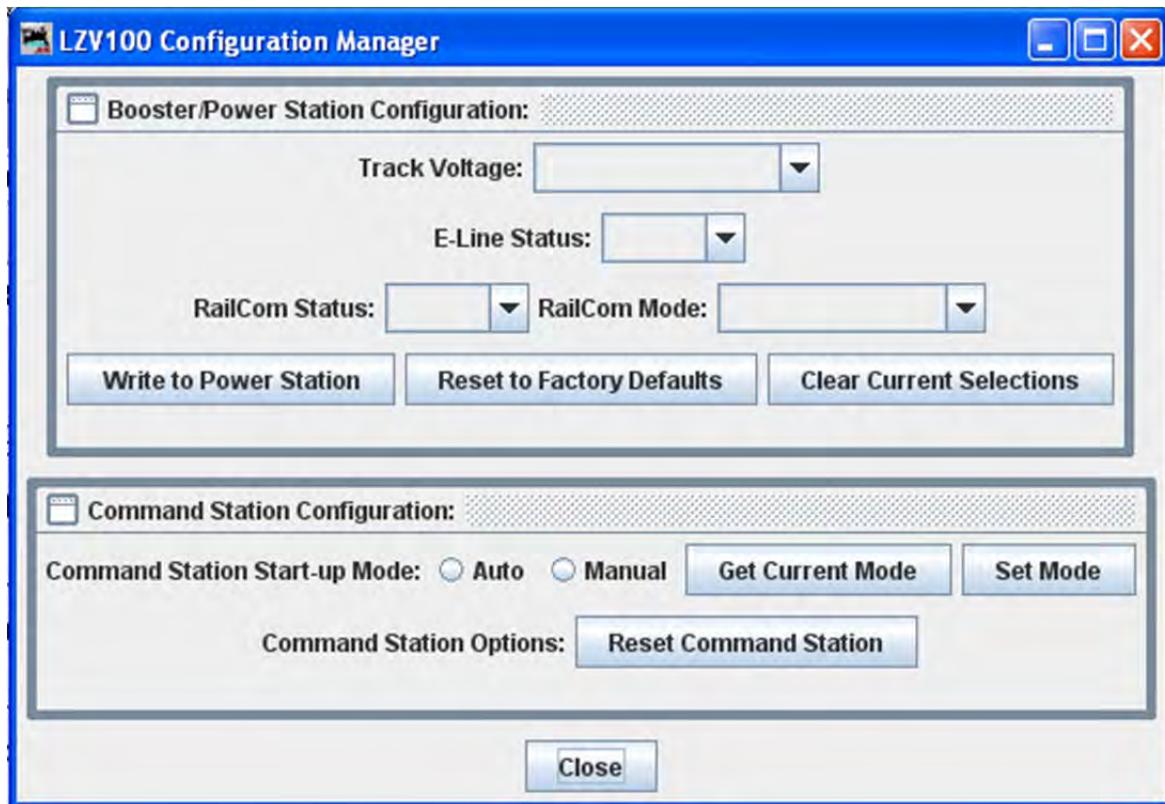
## LI101 CONFIGURATION MANAGER



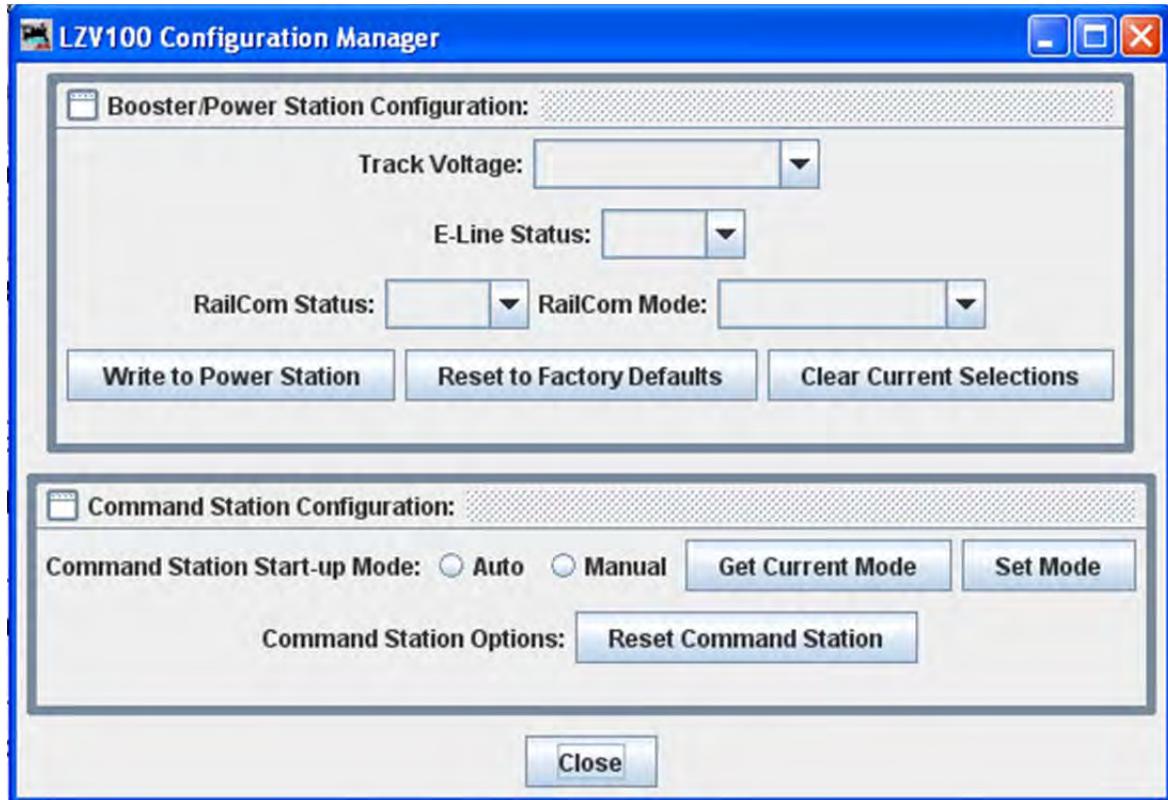
## LZ100 Configuration Manager



## LZV100 CONFIGURATION MANAGER



## LV102 CONFIGURATION MANAGER



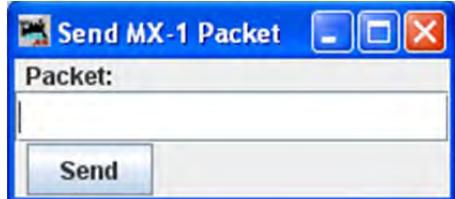
## ZIMO MENU

### COMMAND MONITOR

Opens the [Communications Monitor Window](#) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

### SEND COMMAND

Opens the Send prompt with a text box to enter the Packet message that you want to sent.

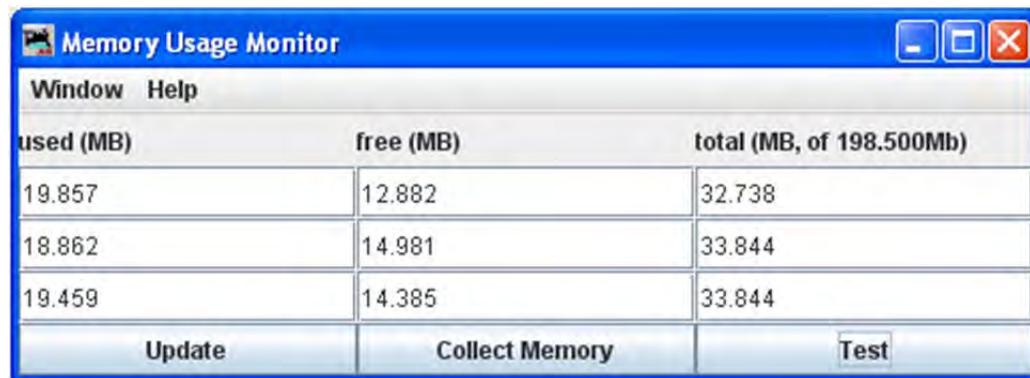


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## DEBUG MENU

## MEMORY USAGE MONITOR

Opens the [Memory Usage Monitor](#) tool lets you see how much memory JMRI is using in your computer.



There are three columns in the display at the top of the panel:

- **used (MB)** - the amount of memory currently in use.
- **free (MB)** - the amount of memory currently allocated to JMRI, but not in use, free for later use.
- **total (MB, of 198.500 Mb)** - the total memory available to JMRI.

The buttons located at the bottom each column:

- **Update button**- puts a new series of values in the bottom row of the memory display and moves the old values up one row.
- **Collect Memory button**- reduces the amount of used memory to the minimum possible by asking Java to run a garbage collection.
- **Test button**- Runs a test of the memory allocation and collection process ( not used by regular users)

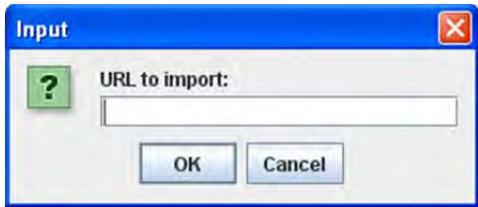
---

## IMPORT DECODER FILE

Opens your operating systems **Open** dialog to locate a decoder definition file to install in DecoderPro.

## IMPORT DECODER URL

Opens an **Input** prompt in which you type a URL of a file to download and install a decoder definition file in DecoderPro.



## RECREATE DECODER INDEX

After adding a decoder definition, updates the decoder index that is used by the Programmers in DecoderPro.

## RECREATE ROSTER INDEX

After importing a new roster file, updates the roster index used by DecoderPro.

---

## CHECK XML FILE

Opens the operating systems **Open** dialog, and checks the syntax of the selected XML file and either displays an information box with OK or the line number of the error message. Used when you create your own decoder definition.

## VALIDATE XML FILE

Opens the operating systems **Open** dialog, and validates the selected XML file against the DTD for that file and either displays an information box with OK or an error message. Used when you create your own decoder definition or modify any XML file used in DecoderPro.

## CHECK DECODER NAMES

Opens the **Open** dialog from which you may select a decoder definition file that will be checked for standard names and lists the items contained in the file that do not have standard names. These are not errors, but they will not show up in the Comprehensive Programmer. To display they must be put in a pane in the decoder definition. Used when you create a decoder definition.

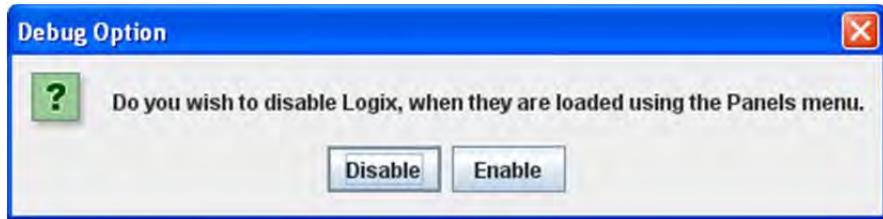
## CHECK PROGRAMMER NAMES

Opens the **Open** dialog from which you may select a programmer definition file that will be checked for standard programmer names and lists the items contained in the file that do not have standard names. This feature is used when developing your custom programmers.

---

## LOAD LOGIXS DISABLED

Will disable/enable Logixs when loaded by the Panels menu.



## LOG MESSAGE

Opens the **Make Log Entry** prompt to allow you manually enter an entry in the log file.



**Message:** Type your message and then click the to add the message to the log file.

## DISPLAY MESSAGE LOG

Displays window with Log messages displayed.

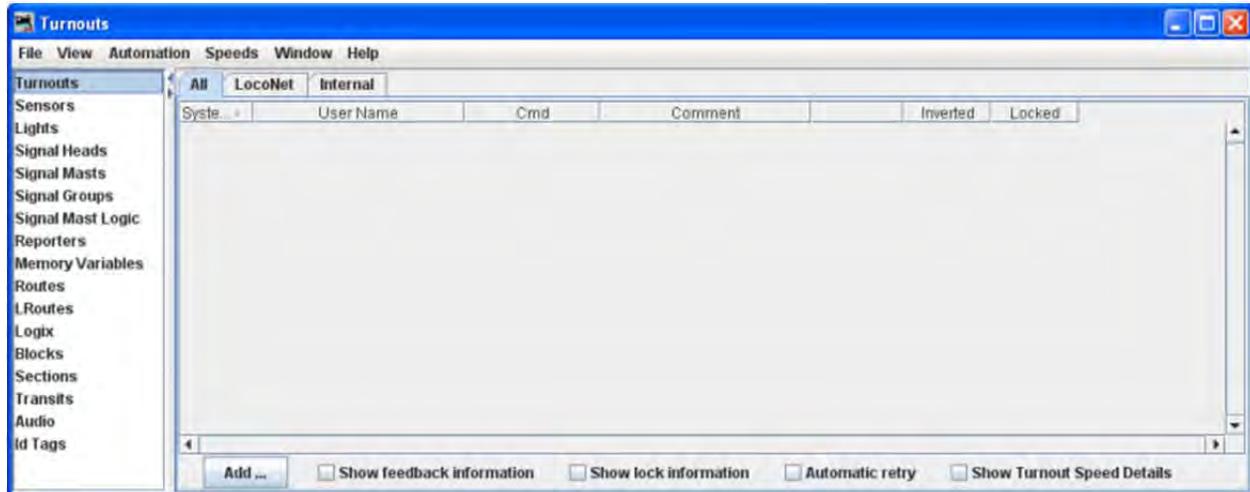
## DISPLAY LOG CATEGORIES

Displays the **Display Log Categories** window which displays a list of all the jmri log message categories.

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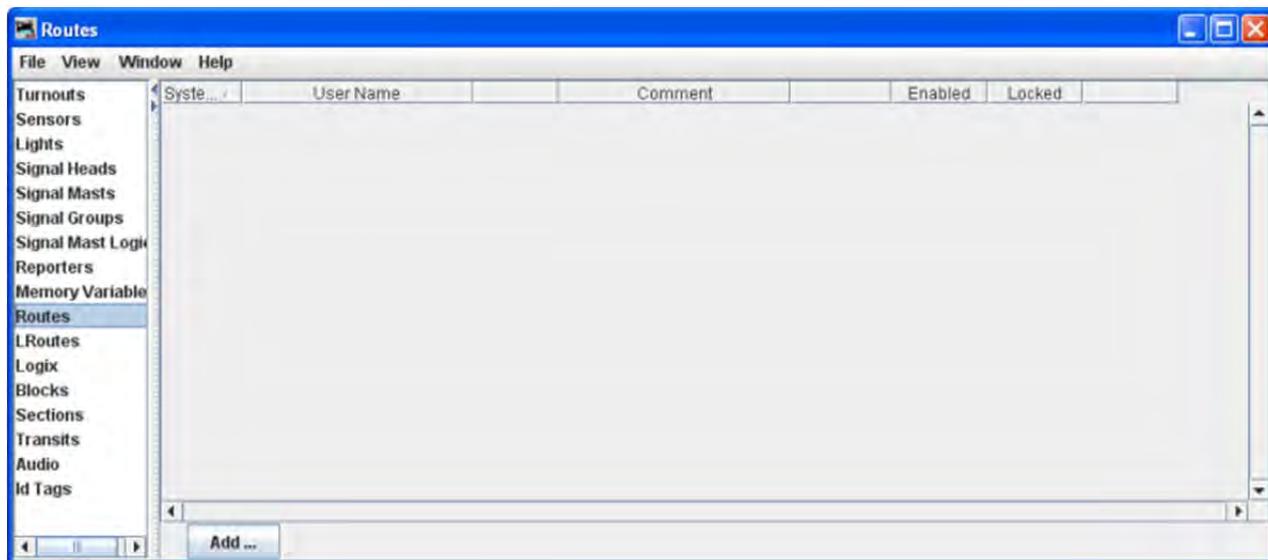
## LISTED TABLE ACCESS

Opens the Turnouts window and lists the turnout tables in use.



## LISTED TABLE ACCESS - DIRECT TO ROUTES

Opens the **Routes** window.



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## PRICOM ►

- PRICOM PACKET TESTER ►
  - Connect—See the PRICOM Pocket Tester Details
- PRICOM FLASH UPDATE

Opens the **PRICOM Flash Updater** window to facilitate updating the firmware.

## USB INPUT CONTROL

The [USB Assignments window](#) lets you connect JMRI sensors and memories to USB input devices on your computer. For example, you could have a JMRI sensor go ACTIVE when you type a key or press a joystick button. You can then use [Routes](#) and [Logix](#) to use that USB input to control your layout.

## USB DEVICE VIEWER

Allows user to view USB devices in use.

---

## RAIL DRIVER THROTTLE

Opens a [Throttle](#) window that is designed to work with [Rail Driver](#).

---

## START MINI WEB SERVER

Starts a Web Server on your computer. You can access the Index.shtml page using the URL displayed in the dialog.

The **JMRI mini web server** (<http://jmri.org/help/en/html/web/index.shtml>) is meant to be a quick and easy way for model railroaders, not Masters of the Web, to get a web connection to JMRI up and running.



---

## START WI THROTTLE

Opens the WiThrottle window which controls the connection between Wi Throttle and iphone, or ipad touch and JMRI

Additional information on [creating a Wi Throttle](#).



## WINDOW MENU

### MINIMIZE

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- DecoderPro
- Power Control
- Throttle

Shows all DecoderPro windows that are open, active windows will be checked.

## HELP MENU

### WINDOW HELP...

Displays help that for the current window.

### GENERAL HELP...

Displays general information about DecoderPro and other JMRI programs.

### LICENSE...

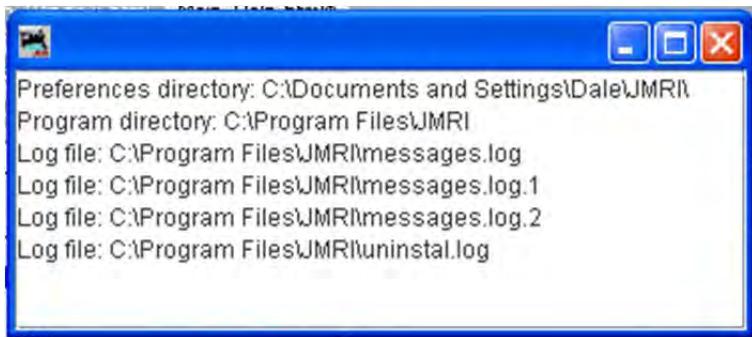
Displays the License agreement under which JMRI operates.

# JMRI® User's Guide Version 2.12

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## LOCATIONS...

Opens an information box showing the location of JMRI programs and files related to DecoderPro.



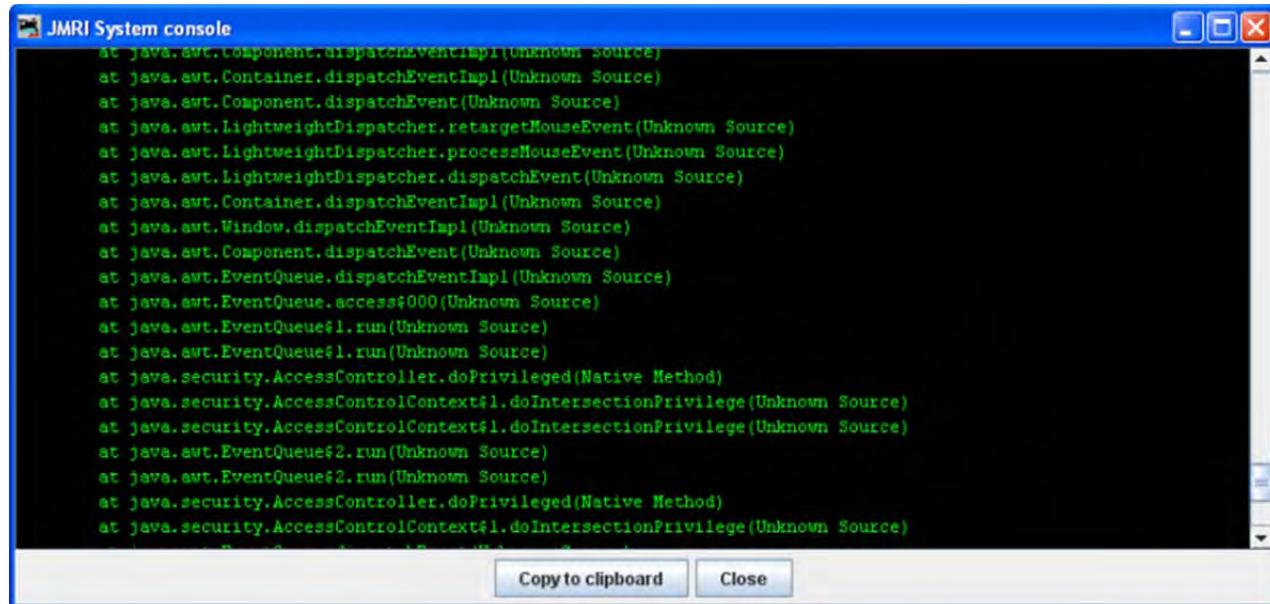
## CONTEXT...

Opens the **JMRI Context** window that shows the configuration setting for your DecoderPro installation.



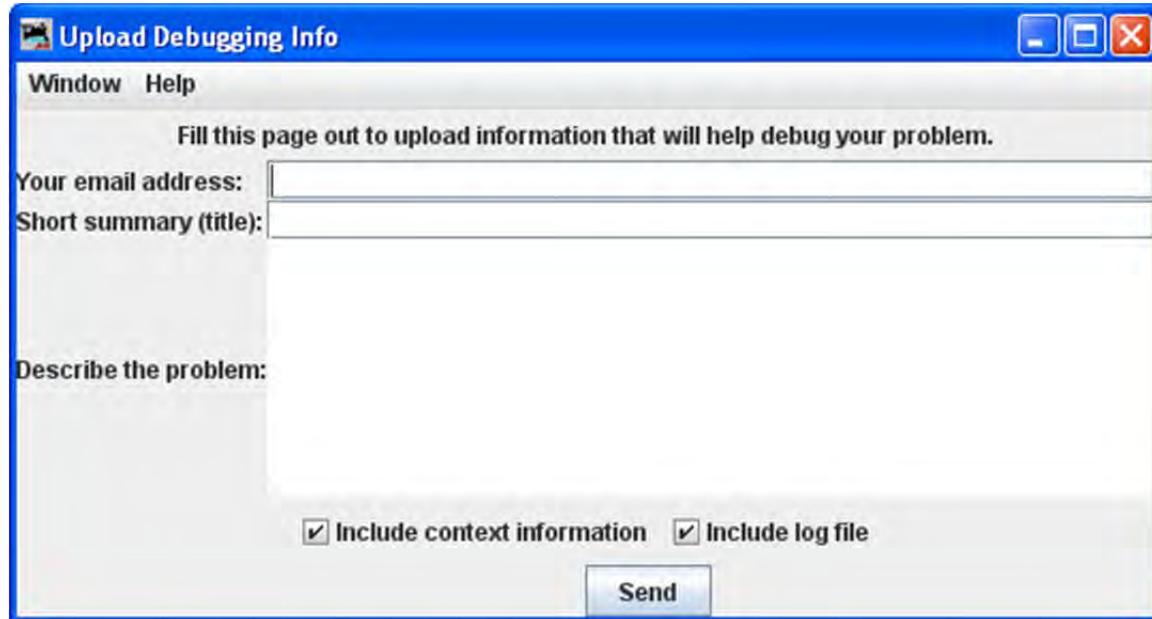
## SYSTEM CONSOLE...

Opens the JMRI System console window that displays the Java Execution activity.



## UPLOAD DEBUGGING INFO...

Opens the **Upload Debugging Info** Window





## CHAPTER 9 – OPERATE TRAINS

### WHAT DOES OPERATIONS DO?

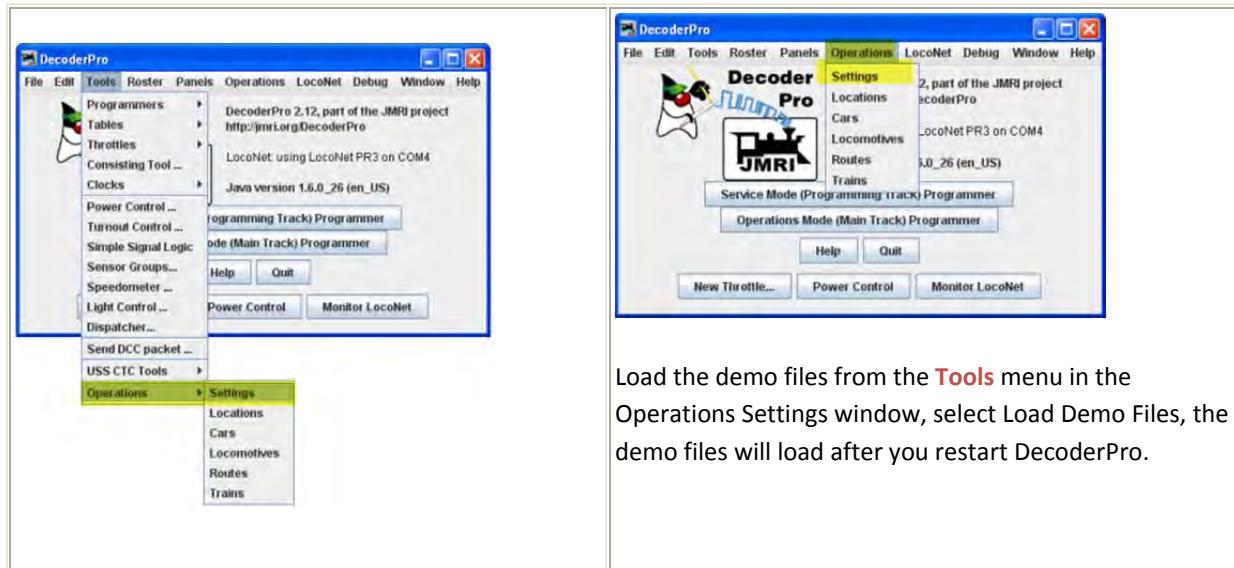
Using JMRI to operate trains allows you to build computer generated car manifests for your railroad. A manifest or switch list details the work that a train will perform during an operations session. The Manifest provides a list of car pick up and set out and shows where the car's are located and where they should be eventually positioned on the railroad. The program allows you to build a roster of cars, define locations on the railroad, and route for trains to travel. The Car roster includes information about the car, including road name, number, type of car, color, length, weight, date built, and owner. Trains are assigned routes that define locations where cars can be picked up or set out. Features include the ability to control what car types, road names, and car loads a location can service, the available track space for a location, and the maximum length the train can be between any two locations on the train's route.

Locations can have spurs, yards, staging and interchange tracks. Spurs are used to service industries, and can optionally have custom schedules assigned to them. Trains can be configured to require a caboose. Optionally, trains can be configured to require a caboose or car with Flashing Rear End Device (FRED). The program generates car manifests for each train and switch lists for any location. A switch list for a location shows the work for all the trains that visit the location. The program can also place icons representing trains on a JMRI panel. The icon can be taught to move in the panel along with the train from location to location.

The operations program is included in the JMRI/DecoderPro® suite of tools and can be found under the main menu heading **Tools-->Operations**.

### OPERATIONS DEMO FILES

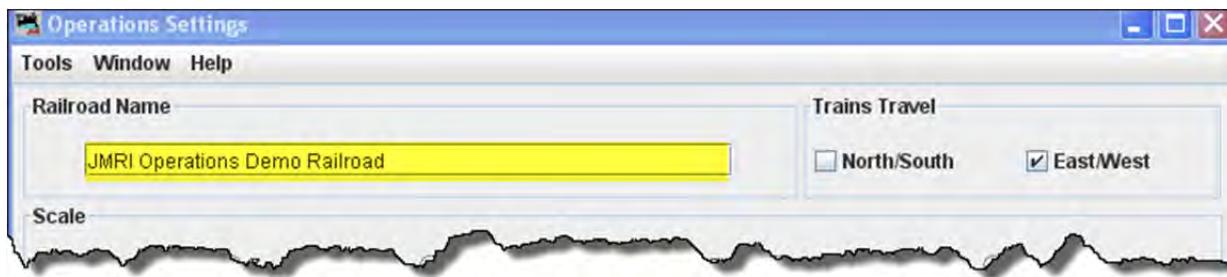
The operations program provides a set of demo files to help introduce you to some of the features and capabilities of this program.



Load the demo files from the **Tools** menu in the Operations Settings window, select Load Demo Files, the demo files will load after you restart DecoderPro.



Selecting Load Demo Files closes DecoderPro® and it must be restarted to open the Demo Railroad.

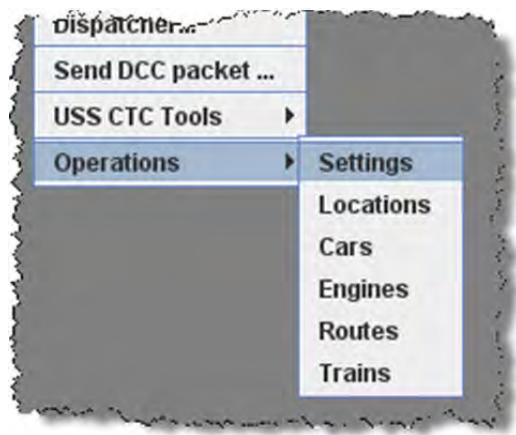


The program will create a backup of your current configuration if you have one, and then load the demo files. Restart JMRI to complete the demo load process. To get rid of the demo files, use the **Restore** function in the **Tools** menu of the **Operations Settings** to reload the first backup date, which is the blank entry form.

The program also supplies a simple panel to show how the train icons work. Load the panel before building the trains by selecting in the main JMRI menu, "Panels->Load Panels .." a window should appear and open the "operations" directory and then open the "Operations Demo Panel" xml file.

## QUICK START

In the Main DecoderPro menu Select **Tools** menu.



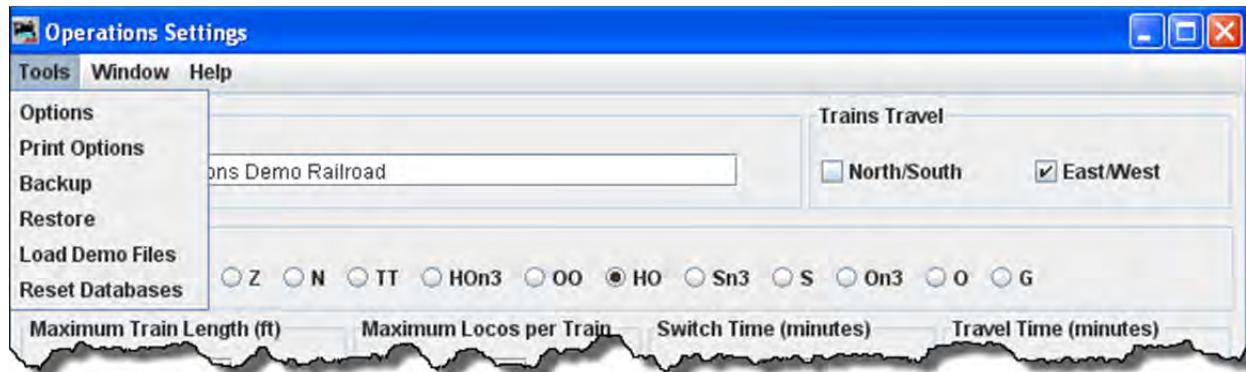
There are six items in this menu. It is recommended that you start with **Settings** and work your way down to **Trains**. We also recommend that when defining your locations that you first use yard and spur tracks, and try staging and interchange tracks when you're more comfortable with how the program operates.

## BRITISH RAILWAYS

The program supports an alternate set of railway terminology for our British modelers. To use British terminologies, go to the JMRI Advanced Preferences (Edit->Preferences.. select the Show Advanced Preferences checkbox) and select English (United Kingdom) in the "Locale:" menu box. The program will also convert from centimeters to meters when entering wagon, locomotive, or location lengths, just append "cm" to any length.

## OPERATIONS SETTINGS WINDOW

### MENUS



### TOOLS

### OPTIONS

The Options window allows you to set several options that can be modified.



## Normal Aggressive

There are two build train options, normal and aggressive. Normal is recommended when you are beginning, as Normal builds guarantee that when a car is delivered(set out) by a train that there will be track space available for the car.

Aggressive builds makes the car's track space available as soon as a car is scheduled for a pickup.

Note that once you've built a train, the build option can not be changed until all trains are terminated or reset.

## Local Car Movement

This set of options controls the local car movements. Normally, it is better not to allow a car to move from one spur directly to another spur in the same location. This type of move is very unrealistic. If you need these types of moves, select the appropriate checkbox.

### **Enable Type, Road and Load Restrictions into Staging**

This option restricts trains to staging tracks that only accept the train's rolling stock type, road and load names. This is useful when you want trains delivered to staging tracks based on the train's rolling stock restrictions. However, if you want certain car types, car loads, or road name to be transported by a train, but not delivered to staging, deselect this feature

### **Prompt for Departure Track from Staging**

If you would like the program to ask you which track a train should depart from staging during the train build, select this option. Normally, during the train build the program would select the least recently used track when determining the track to depart from. Note that the program will only prompt you if there are two or more trains available in staging that meet the train's requirements.

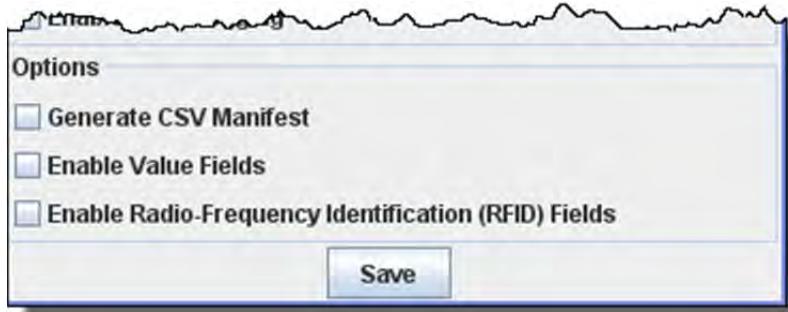


### **Enable Car Routing**

When car routing is enabled, the program will use multiple trains to deliver a car to its final destination. It is recommended that you leave the option enabled. With car routing enabled, you can use a [Schedule](#) to deliver a car to a specific location. The car routing algorithm will search for the most efficient route for the car to travel. The algorithm will try to find a route using a maximum of five trains to complete the car move. Note that the program never gives up trying to route a car. If a car has been assigned a "Final Destination" the program will try and route the car after every move.



If you want the operations program to log your locomotive, car, or train movements to file, select the appropriate checkboxes. The program will create a new directory called logger in the operations directory. For each day's session the program will create a new file(.csv) using the day's date.



To create your own custom manifest using a comma separated value (.csv) file, select this option. You can use a program like Excel to create a manifest to your liking. The manifest is located in the operations directory in a directory called

**csvManifests.** Each line of the file starts with a two or three letter code, followed by the code's description, and then any parameters associated with the code

Code	Description	Parameters
------	-------------	------------

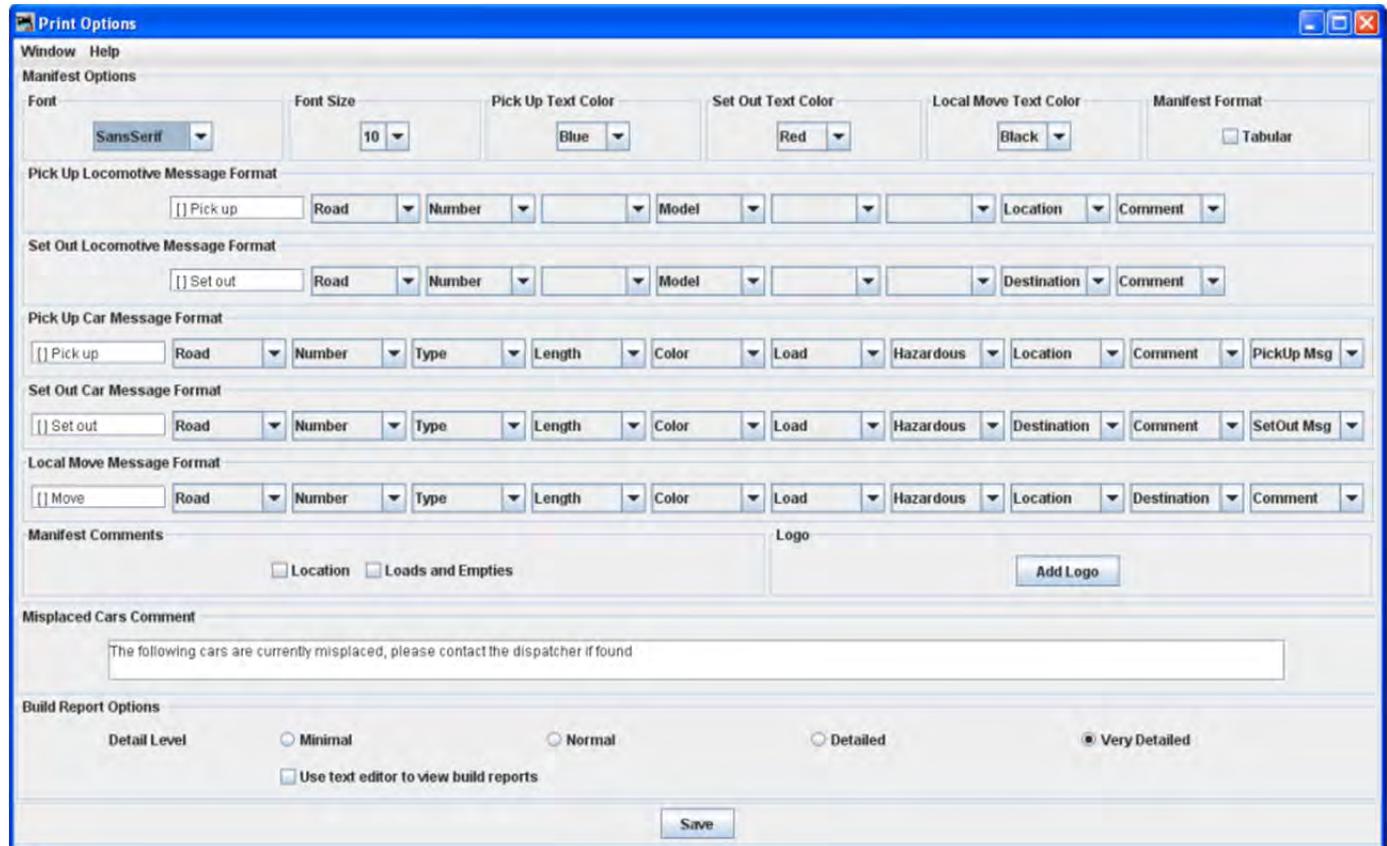
AH	Add Helpers	
AT	Arrival Time	Time
CC	Change Locos and Caboose	
CL	Change Locos	
DT	Departure Time	Time
DTR	Departure Time Route	Time
LC	Location Comment	Comment
LN	Location Name	Name
NW	No Work	
PC	Pick up car	See below
PL	Pick up loco	See below
RC	Route Comment	Comment
RH	Remove Helpers	
RN	Railroad Name	Name
SC	Set out car	See below
SL	Set out loco	See below
TC	Train Comment	Comment
TD	Train Departs	Name
TL	Train Length	Length
TM	Train Manifest Description	Description
TN	Train Name	Name
TW	Train Weight	Weight
TT	Train Terminates	Name
VT	Valid	Month/Day, Year

Time Time uses the format HourMinute

The car parameters for pick up car (PC) and set out car (SC) are road, number, type, length, load, color, location name, track name, destination name, destination track name, owner name, kernel name, car comment, pick up comment, set out comment, C, F, H, RFID. Where C = Caboose, F = FRED, and H = Hazardous.

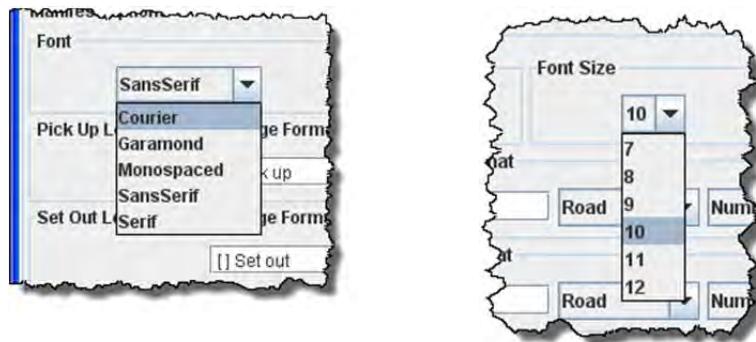
The loco parameters for pick up (PL) and set out loco (SL) are road, number, model, length, type, hp, location name, track name, destination name, destination track name, owner name, consist name, car comment, RFID.

## PRINT OPTIONS

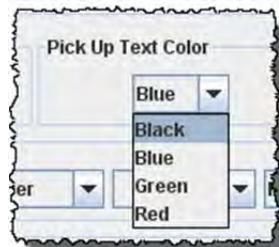


You can modify how the program prints the train manifests and the amount of detail that the build report provides.

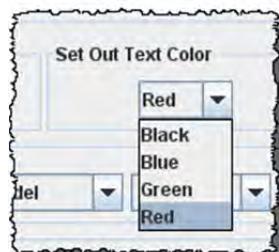
## MANIFEST OPTIONS



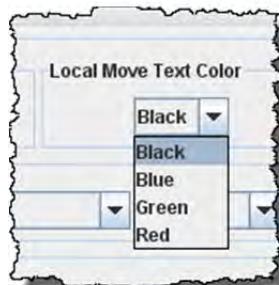
Select the desired **Font** and **Size**



Assign manifest print color for car or locomotive **Pick Up**



Assign manifest print color for car or locomotive **Set Out**



Assign manifest print color when the operation is to move a car from one track to another at same location



Select if you want manifest printed in tabular format. It works best with mono-spaced fonts, **Courier** or **Monospaced**

## PICK UP LOCOMOTIVE MESSAGE FORMAT

You may customize the messages for your manifest and switch list printing. Select formats from dropdown menus. To remove an attribute select blank. The Prefixes in the text boxes may be edited. If you want to use the text color options, the set out, pick u and move prefixes must be unique.

## SET OUT LOCOMOTIVE MESSAGE FORMAT

## PICK UP CAR MESSAGE FORMAT

## SET OUT CAR MESSAGE FORMAT

## LOCAL MOVER MESSAGE FORMAT

## Manifest Comments

Each location can have an optional comment. You can print these comments on your manifest if the  **Location** is selected.

Select  **Loads and Empties** to show how many car loads and empties are in the train.

## Logo

allows you to add a logo in the top right hand corner of your manifests and switch lists, press and select a file with the image you want to display. Each train in your roster may have a different logo, this is set in [Trains Setup](#)

Missplaced Cars Comment

## Build Report Options

**Detail Level** You can adjust the amount of information that the build report will show. Select one of the four levels. The program when generating the build reports stores the **Very Detailed** information to disk.

-  **Minimal** -- provides the least amount of information. Can provide information when train build is not completed.
-  Normal -- setting shows which engines and cars are being excluded from the train, and which engines and cars are being picked up and dropped.
-  Detailed -- setting will generate quite a few pages depending on the size of your railroad. It will show all available cars and engines, and a bit how the program finds destinations for the cars and engines.
-  Very Detailed -- setting produces the most pages, and will show why cars are not picked up or dropped.

Be sure and press **Save** button after changing the build report selection.

- **Backup**

Opens the system **Save** dialog

- **Restore**

Opens the system **Open** dialog

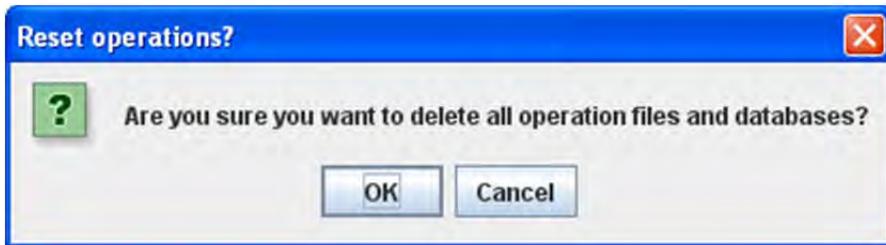
- **Load Demo Files**

Opens the **Demo load successful** dialog box



- **Reset Databases**

Opens the **Reset operations?** Dialog box

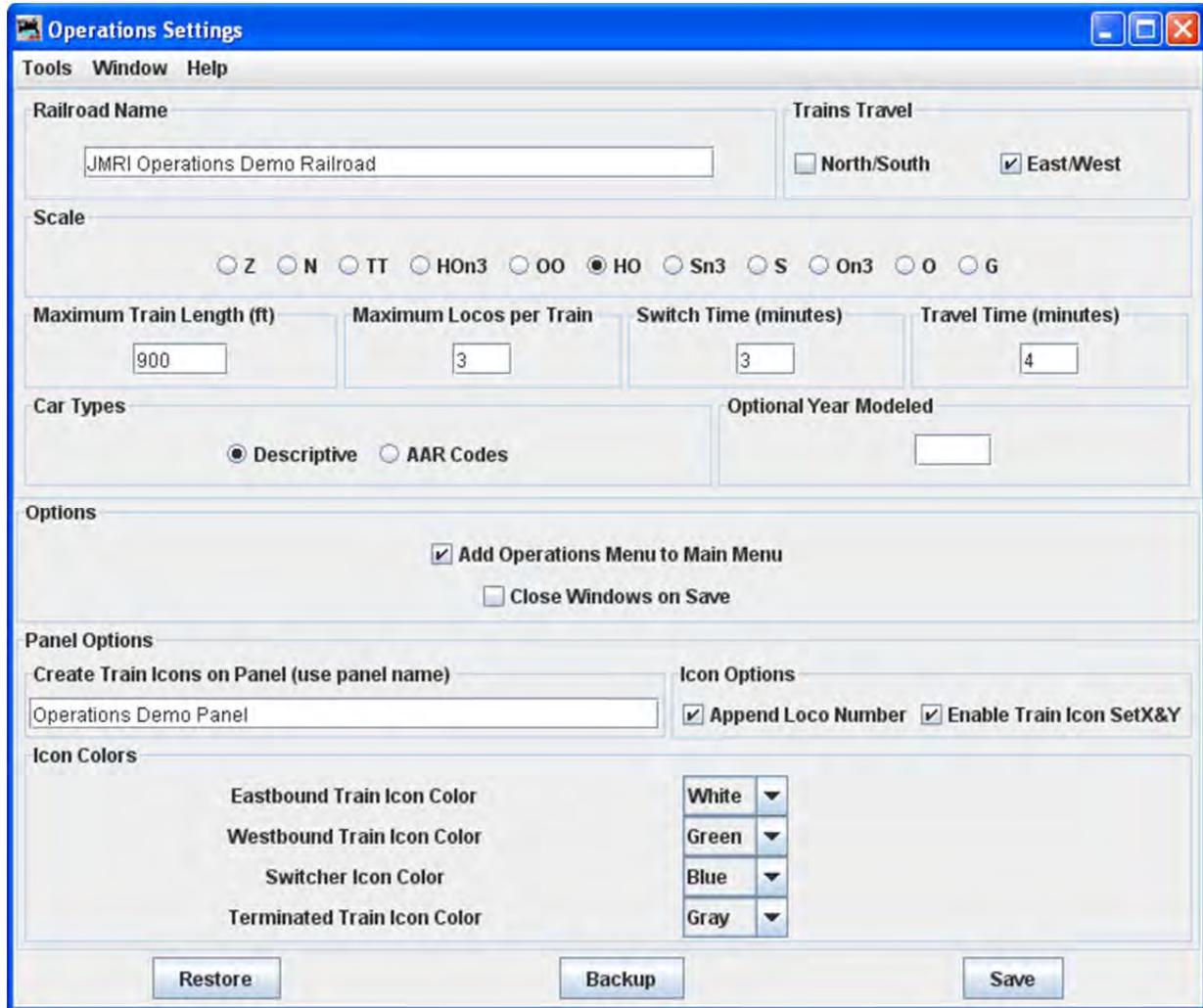


## WINDOWS

JMRI normal window menu

## HELP

JMRI normal help menu



### Railroad Name

Enter the name of your railroad. This name will show up on your manifests You may use a different name for every train in your roster. See [Train Options](#) for details.

### Trains Travel North/South East/West

If your railroad depicts trains traveling north and south select the "North/South" box, if your trains travel east and west select the "East/West" box. You must select at least one direction, and can if desired select both.

### Scale

Select the radio button for the scale of your railroad. This is useful when you enter the length of cars and tracks. You can enter the number of actual inches and the program will convert to scale feet. Append a double quote to the length when entering actual inches. The program will also automatically assign the proper NMRA weight for a car based on scale and length.

## Maximum Train Length(ft.)

This field provides the maximum default train length between cities. Later you can override this length if you wish a shorter train between any two locations. A 1000 foot train can carry approximately 20 cars, and is of course dependent on the car lengths assigned to the train.

## Maximum Locos per Train

Now set the maximum number of locomotives that you want the program to assign to a train. If you don't want the program assigning engines, set this value to 0.

## Switch Time (minutes)

## Travel Time (minutes)

The program when generating switch lists for the various locations on your railroad, will estimate the arrival times for your trains based on the train's departure time and the switch and travel times. Enter the average number of minutes it takes to drop or pick up a car on your railroad. Then enter the average amount of time in minutes it takes to travel from one location to the another. Later when you create a [route in the Operations Route](#), you will be able to increase or decrease the train's travel time between any two locations.

## Car Types Descriptive AAR Codes

The program has two sets of car types for you to use. **Descriptive** provides type names like **Boxcar** and **Tankcar**, and **AAR** provides type names like **XM** and **T** for boxcars and tank cars respectively. Select the one that you prefer.

## Optional Year Modeled

You can optionally enter the year you want printed on your train manifests.

## Options

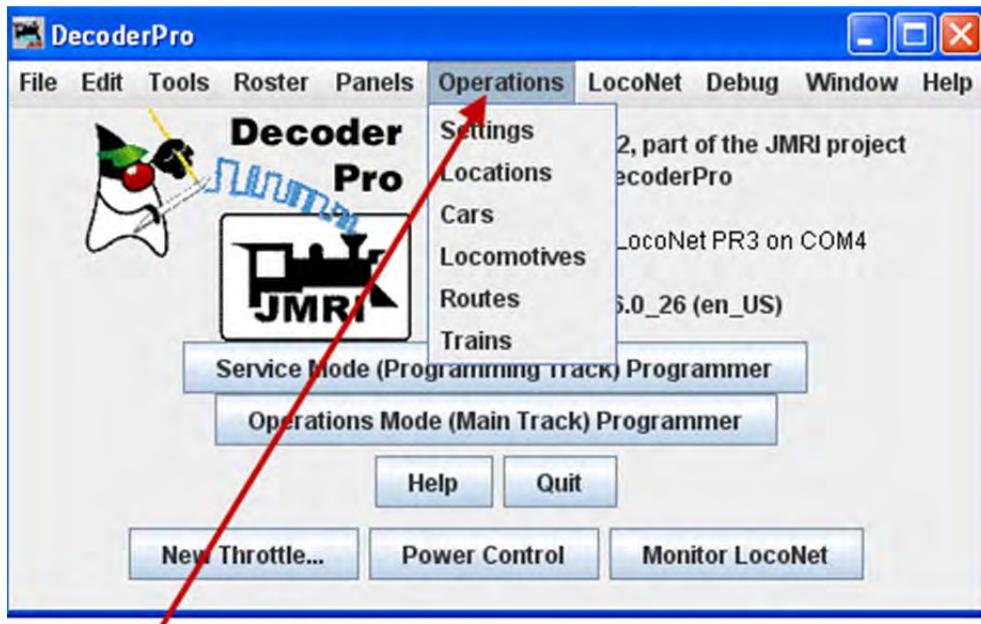


### Add Operations Menu to Main Menu

When selected, and saved, the operations menu will be added to the main menu bar the next time you start JMRI.. To remove it go through the same procedure... in the Settings window uncheck the box, "Save" the change and restart DecoderPro®.



### Close Windows on Save



With the box checked, the next time you open DecoderPro® the Operations drop down will appear

**Panel options** will not be covered in this manual at this time. Panels are normally created as a part of PanelPro®

Save when you're finished with the settings window, press the save button to store the setting in a file called **Operations.xml**. You can find this file in your JMRI directory in a folder called **operations**. The program will also create a backup file each time you press the **Save** button

**Backup** button will store a copy of the operation files in a new directory in operations called **backups**, and then stores the operation files in a directory that is based on the day you created the backup. For example, if today was November 21, 2008, the program will create a backup directory named **2008\_11\_21**.

**Restore** will prompt you to select which set of backup files you wish to use to recover your operation files. You must quit and restart DecoderPro® to complete the restoration of the operation files.

## OPERATIONS LOCATIONS WINDOW

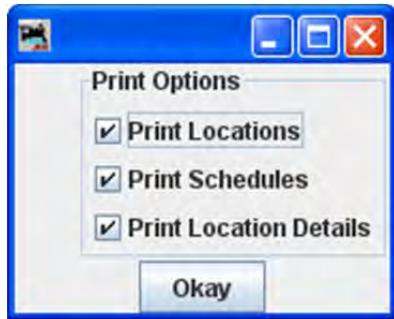
The Operations Tool, Locations opens the Locations window as shown. Locations are places on your railroad that trains visit to pick up or drop off cars and engines. Locations can be cities, towns, or just places where trains need to work cars. To enter a new location press Add button, which will open the **Add Location** window which we will discuss in a moment? But first let's discuss the "Locations" window itself.



## MENU BAR

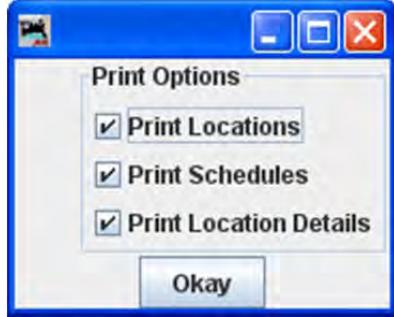
### TOOLS

- o PRINT



Click on opens system printer dialog.

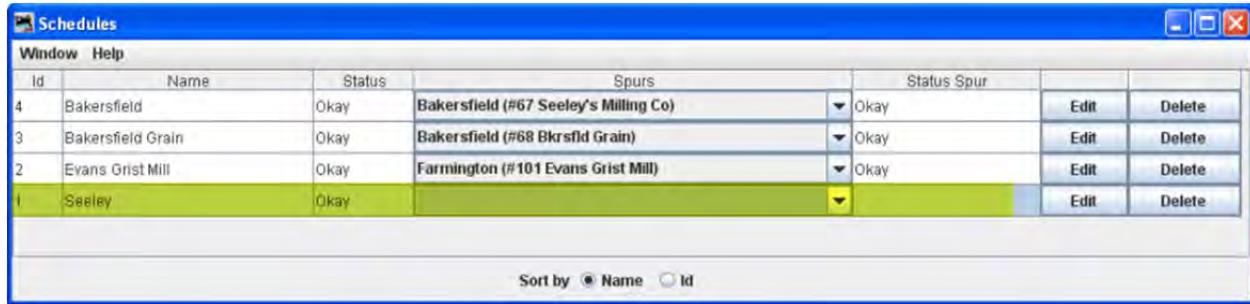
- o PREVIEW



Click opens the print preview window showing Location information.

- o SCHEDULES

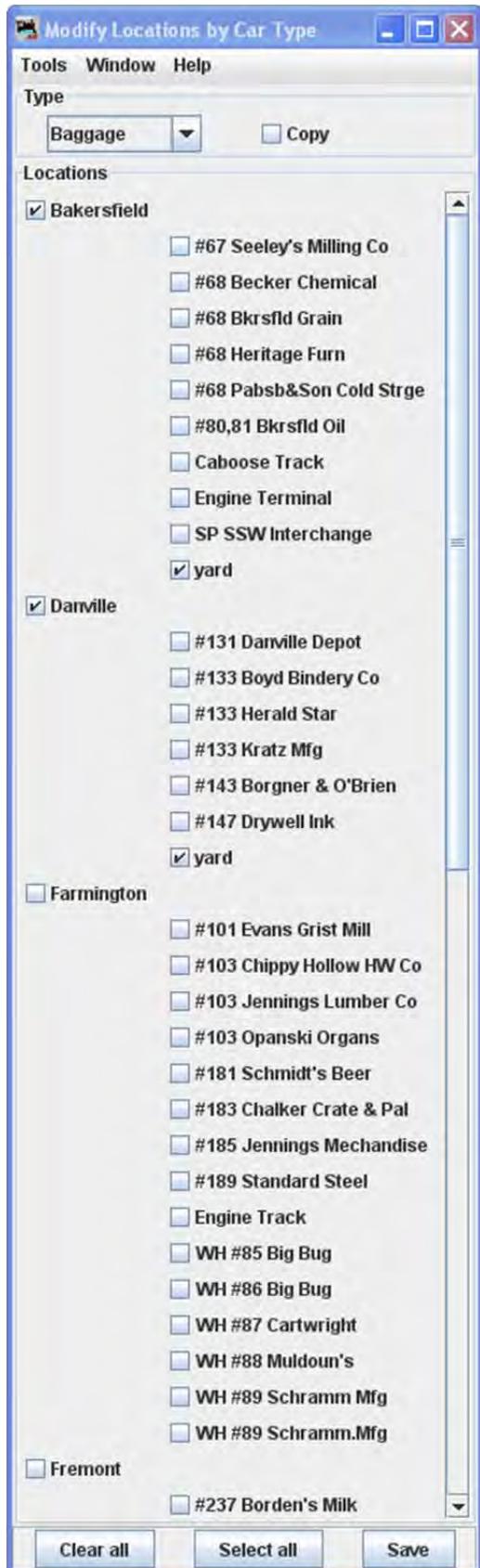
Opens the **Schedules** panel. (for details see Schedule)



If you would like to see cars delivered in a particular sequence, or with a specific load for delivery or shipping, the program allows you to apply a schedule to a siding. This is an optional feature and shouldn't be used until you become very familiar with how the program generates manifests and switch lists.

#### MODIFY LOCATIONS BY CAR TYPE

This tool can open from the **Locations** window **Tool** menu. Use this tool to quickly modify the type of cars your locations and tracks will service. This is very useful when adding a new car type to your roster.



## Menu Bar

### Tool

- **Print Locations by Car Type**  
Opens system printer dialog
- **Preview Locations by Car Type**  
Opens the list in printer preview window

### Window

### Help

First select the car type you wish to modify from the drop-down list. When the type is selected notice that all cars of that type at the locations selected will be checked.

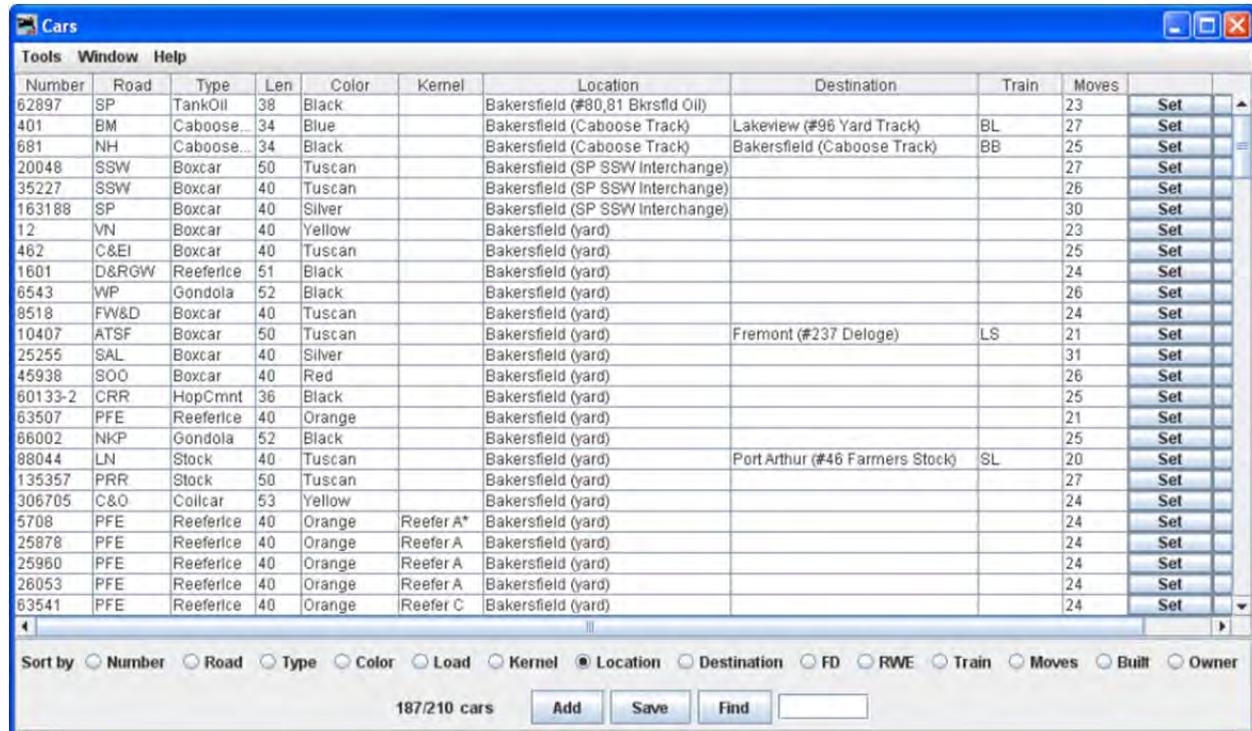
Select or deselect the locations and tracks you want to service, and press to modify your locations and tracks.

You can also  **Copy** how an existing car is serviced by your locations and apply those rules to another car. To make a car behave like another, first select the car you would

like to copy, then select the  **Copy**, the car type will now appear to the right of the checkbox, then select the type of car you want to modify, and press to have both car types serviced by the same locations and tracks.

- o **SHOW CARS**

Opens Cars window which lists cars for this location



## WINDOW

### HELP

At the bottom of the window you may select Sort order of the locations

Sort by  Name  Id      Sets the sort order for the locations

Press **Add** button to add a location

The **Add Location** window is opened. At this point only the Location Name and the type operation at this location entries are active.

### OPERATIONS LOCATIONS WINDOW

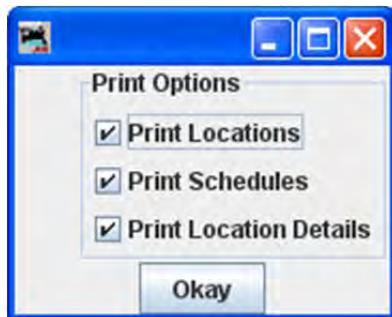
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## MENU BAR

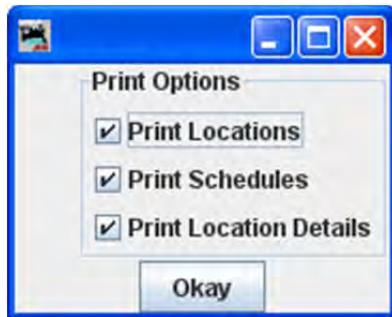
## TOOLS

- o PRINT



Click on opens system printer dialog.

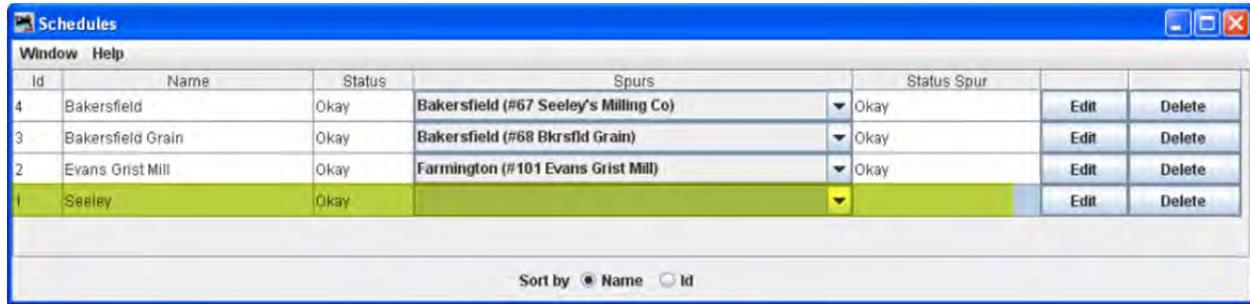
- o PREVIEW



Click opens the print preview window showing Location information.

- o SCHEDULES

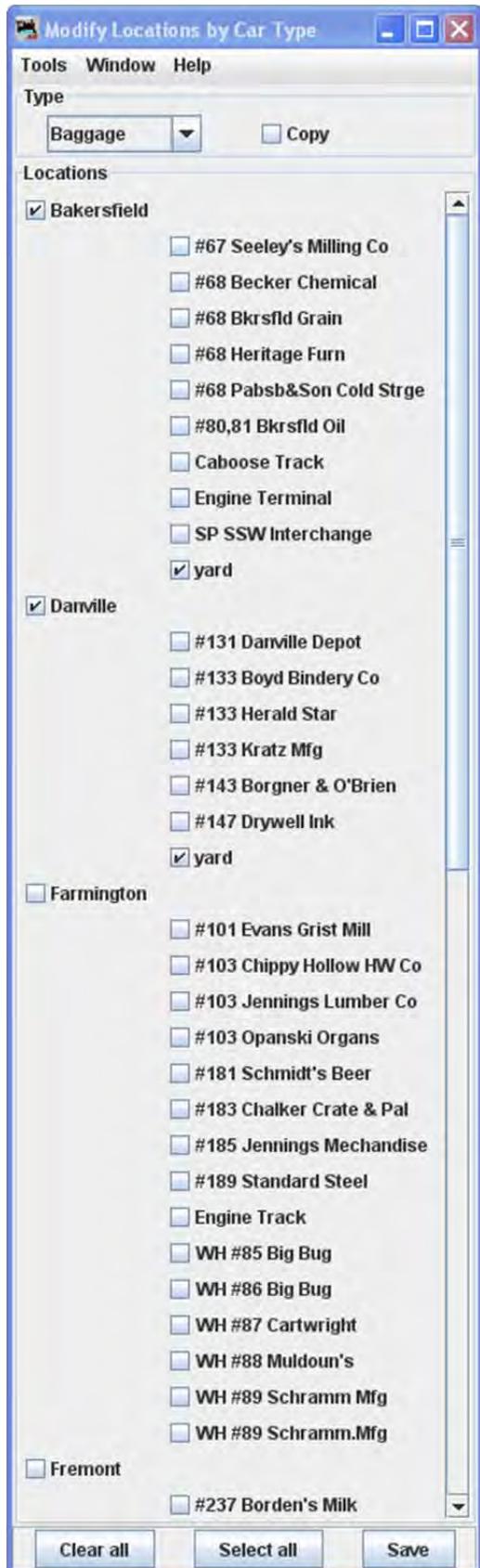
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## Menu Bar

### Tool

- **Print Locations by Car Type**  
Opens system printer dialog
- **Preview Locations by Car Type**  
Opens the list in printer preview window

### Window

### Help

First select the car type you wish to modify from the drop-down list. When the type is selected notice that all cars of that type at the locations selected will be checked.

Select or deselect the locations and tracks you want to service, and press to modify your locations and tracks.

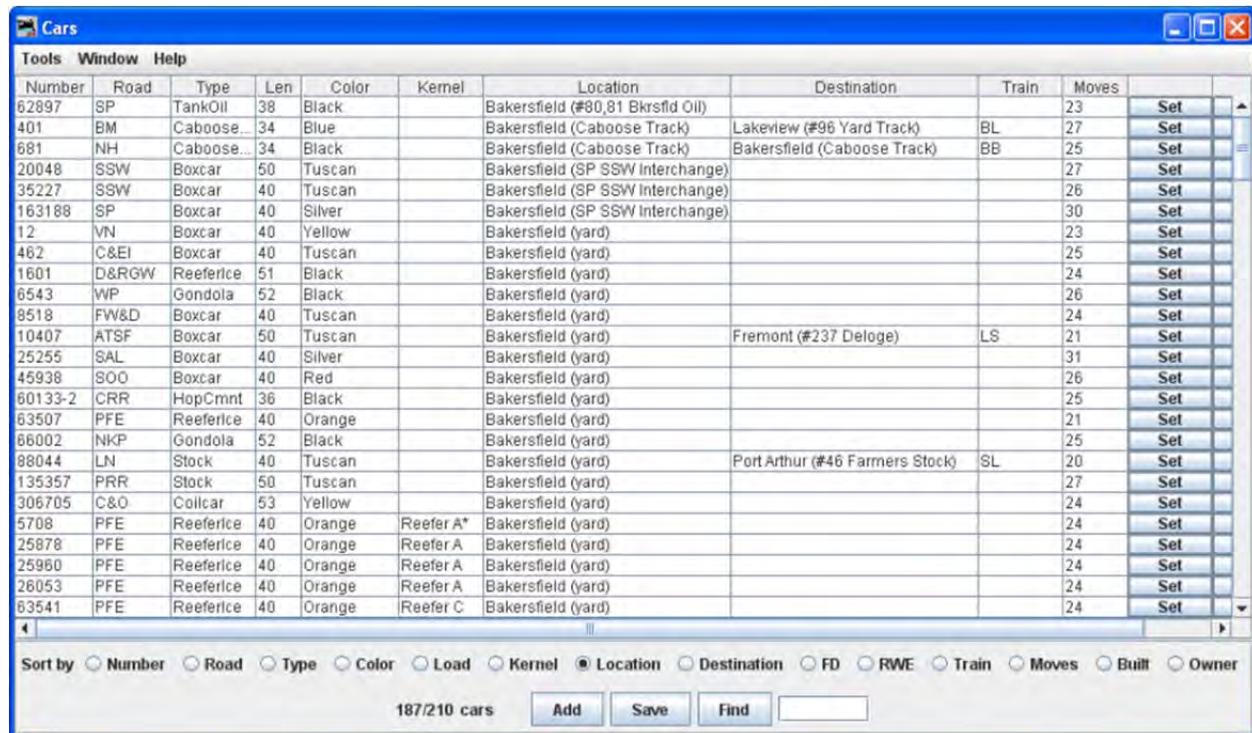
You can also  **Copy** how an existing car is serviced by your locations and apply those rules to another car. To make a car behave like another, first select the car you would

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- o

## SHOW CARS

Opens Cars window which lists cars for this location



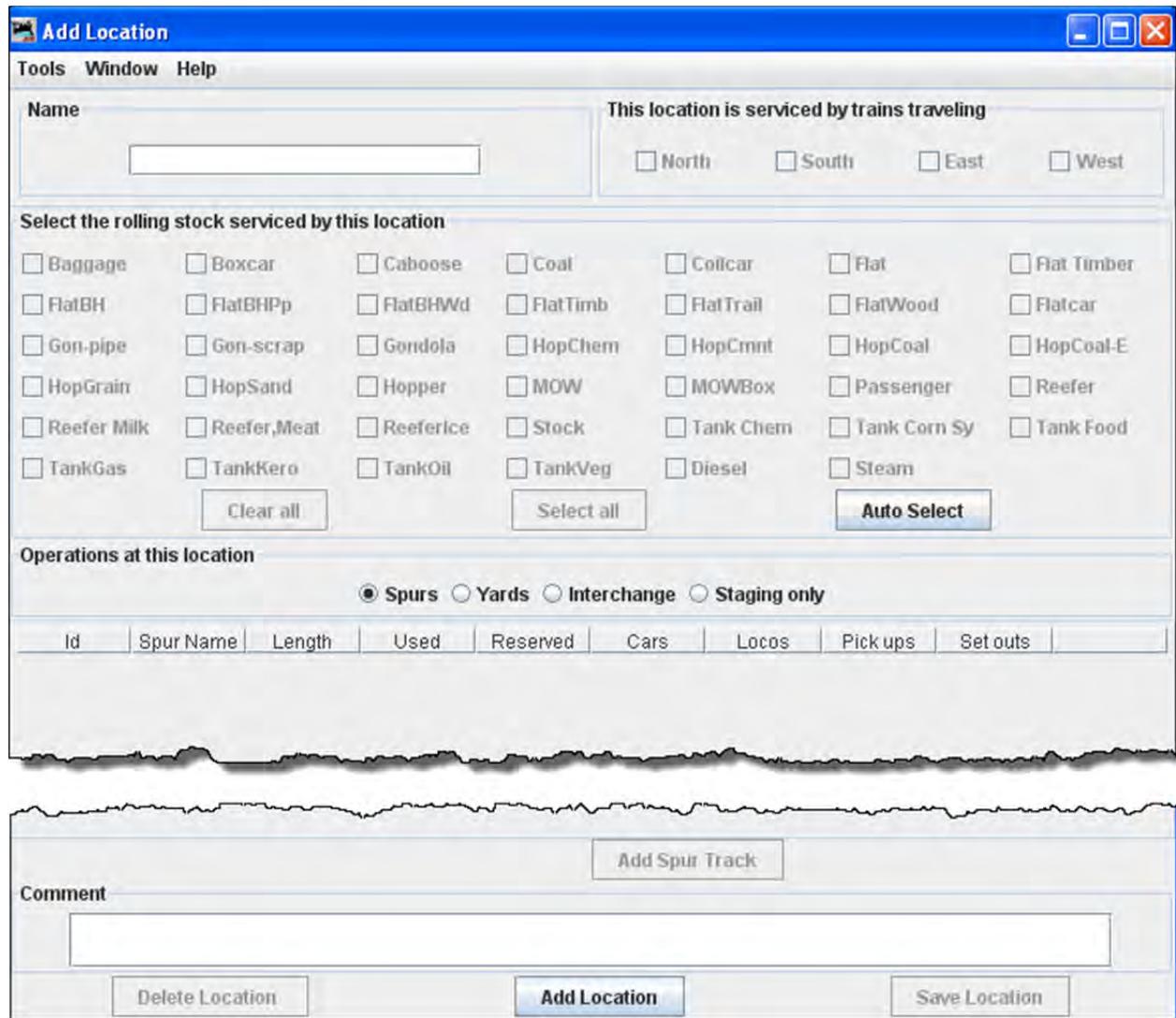
- **Window**
- **Help**

At the bottom of the window you may select Sort order of the locations

Sort by  Name  Id      Sets the sort order for the locations

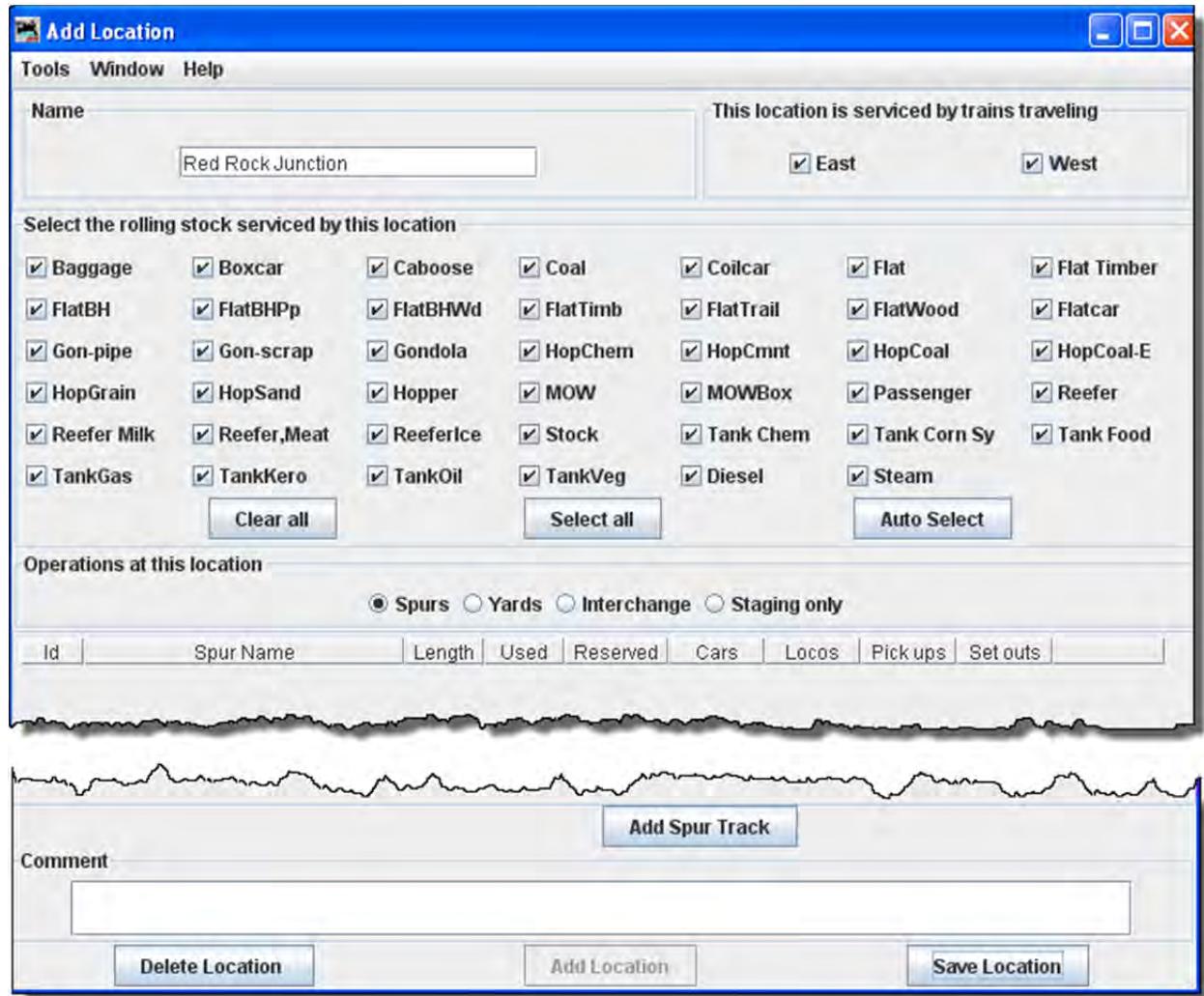
Press Add button to add a location

The **Add Location** window is opened. At this point only the Location Name and the type operation at this location entries are active.



**Name**  The location name must be unique; the program will not allow two locations with identical names. However, if you want more than one location to have the same name for your manifests and switch lists, add a hyphen and a number to the locations name. For example, **Boston-1** and **Boston-2** will print as **Boston**. The program will remove the hyphen and number when printing manifests and switch lists.

Press the Add Location button at the bottom of the panel. The various fields that were disabled should be enabled.



Each location can have several yards, spurs, interchange or staging tracks. Yards are where cars and engines are placed for temporary storage. A spur can be an industry or any place where a car is loaded or unloaded. For a train to service a location there must be at least one track for that location. See below how to add tracks to your location.

### Select the rolling stock serviced by this location

The tables show the length of the tracks, the amount of track that is occupied (Used) by cars and engines, the total number of cars and engines (Rolling Stock) at each location, the number of cars and engines that will be picked up (Pickups) by trains, and the number of cars and engines that will be delivered (Drops) by trains.

**This Location is Serviced by Trains Traveling**  North  South  East  West

You can decide which train direction the location can service. For example, if only south bound trains can access the location select South and deselect the other directions. This can be useful if you want to only support trailing point switching for a given location. If a location can support multiple directions then select the ones that are

appropriate.

## Operations at this location Spur Yards Interchange Staging only

To add a location, press the "Add ... Track" button. Now enter the name of the location along with the length of the track in scale feet or in actual inches. Append a double quote ("") to the length when entering actual inches and the program will convert the length into scale feet. Append cm if you want to convert from centimeters to meters. Press the "Add ... Track" button at the bottom of the panel and the disabled fields should now appear.

The **Add** button at the bottom of the window will change corresponding to the location you want to add.

### ADD SPURS, YARDS, INTERCHANGE, OR STAGING ONLY(CORRESPONDING TO THE PRESENT TASK)

To add a location , press the "Add ... (location)" button.

**Add Spur Track** button

**Add Yard Track** button

**Add Interchange** button

**Add Staging Only** button

EACH OF THESE BUTTONS OPENS A CORRESPONDING DIALOG TO DESCRIBE ITS FUNCTION.

### SAVE --- TRACK

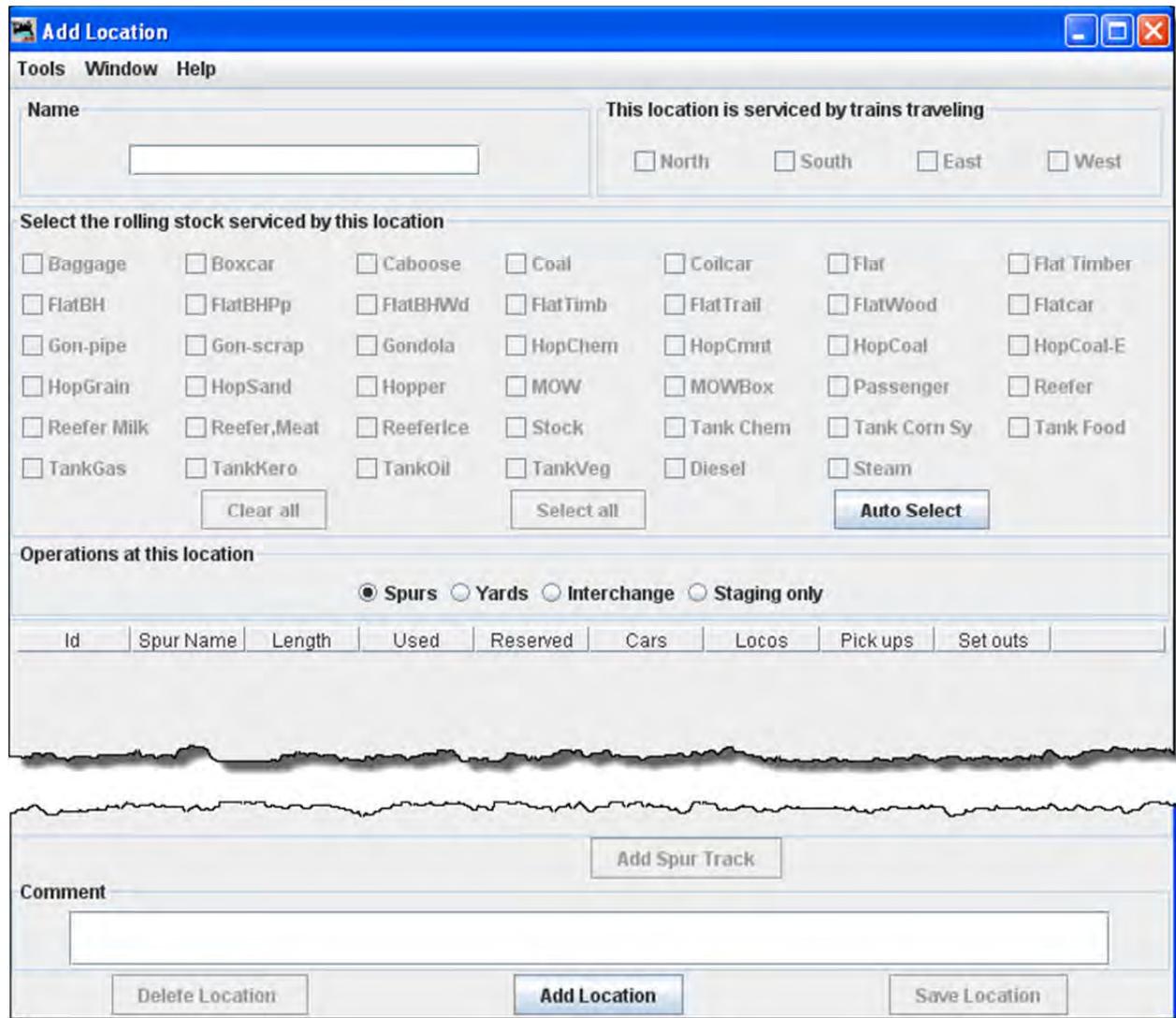
Press the **Save Location** button to save your work. The program will create a file (OperationsLocationRoster.xml) in your JMRI directory in a folder called "operations". The program will also create a backup file containing the last settings for all of your locations.

Spurs are very similar to [Yards](#), so see above for more information. You can if you wish schedule the order that cars will be delivered to a spur. See [Schedules](#) below for more information.

### OPERATIONS ADD SPURS

A spur is used to service an industry. To add a spur, press **Add Spur** button. Spurs are very similar to [Yards](#). You can if you wish schedule the order that car will be delivered to a spur, or demand cars with certain loads using [Schedules](#).

When a car is placed at a spur the car's load status is modified. The program provides two load names for all cars. The default **Empty** or **E** and the default **load** or **L**. If a car has one of these loads when it arrives at a spur, the load will change to the other, i.e. **E** becomes **L** and **L** becomes **E**.

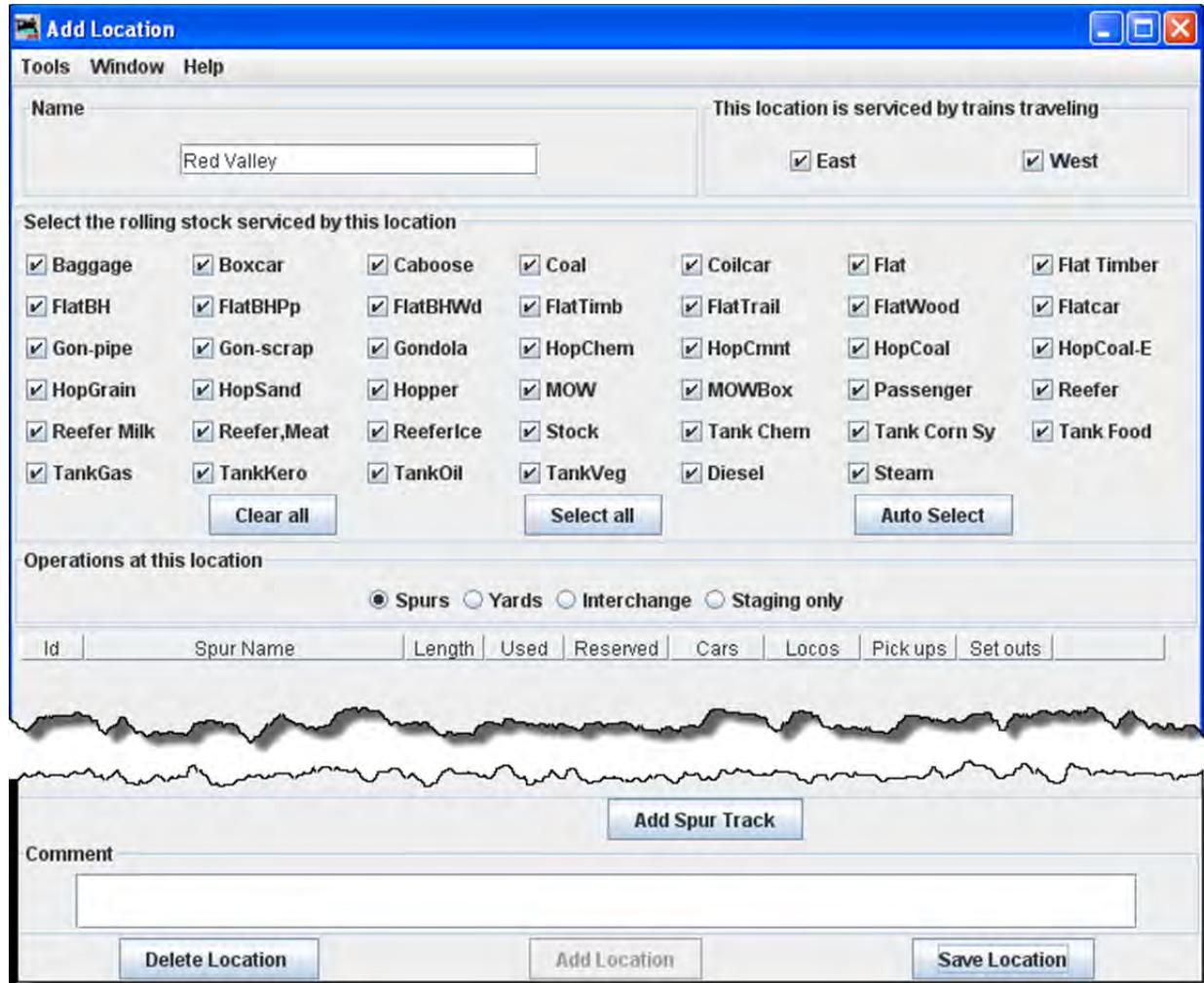


To add a location as a spur, in the **Add Location** window, type the **Name** [ ] of the spur location, note most of the window is greyed out until the location is added. The location name must be unique; the program will not allow two locations with identical names. However, if you want more than one location to have the same name for your manifests and switch lists, add a hyphen and a number to the locations name. For example, "Boston-1" and "Boston-2" will print as "Boston". The program will remove the hyphen and number when printing manifests and switch lists.

Now select **Operations at this location** [ ] **Spurs**, then press the Add Location button at the bottom of the window.

A spur can be an industry or any place where a car is loaded or unloaded. For a train to service a location there must be at least one track for that location.

Press the Add Location at the bottom of the panel. The various fields that were disabled should be enabled.



You may select **This location is serviced by trains traveling**, select at least or any number of the directions

depending on access to your siding. We have selected  East and  West

You can decide which train direction the location can service. For example, if only south bound trains can access the location select "South" and deselect the other directions. This can be useful if you want to support only trailing point switching for a given location. If a location can support multiple directions then select the ones that are appropriate.

**Local Switcher:** If you want only a local switcher to service a siding, deselect all of the direction boxes for that siding. The program will only allow a train that has one location in its route (local switcher) to service the siding. This would be useful if you wanted your trains to pick up and drop cars to a yard, and then have a local switcher move them to the town's sidings.

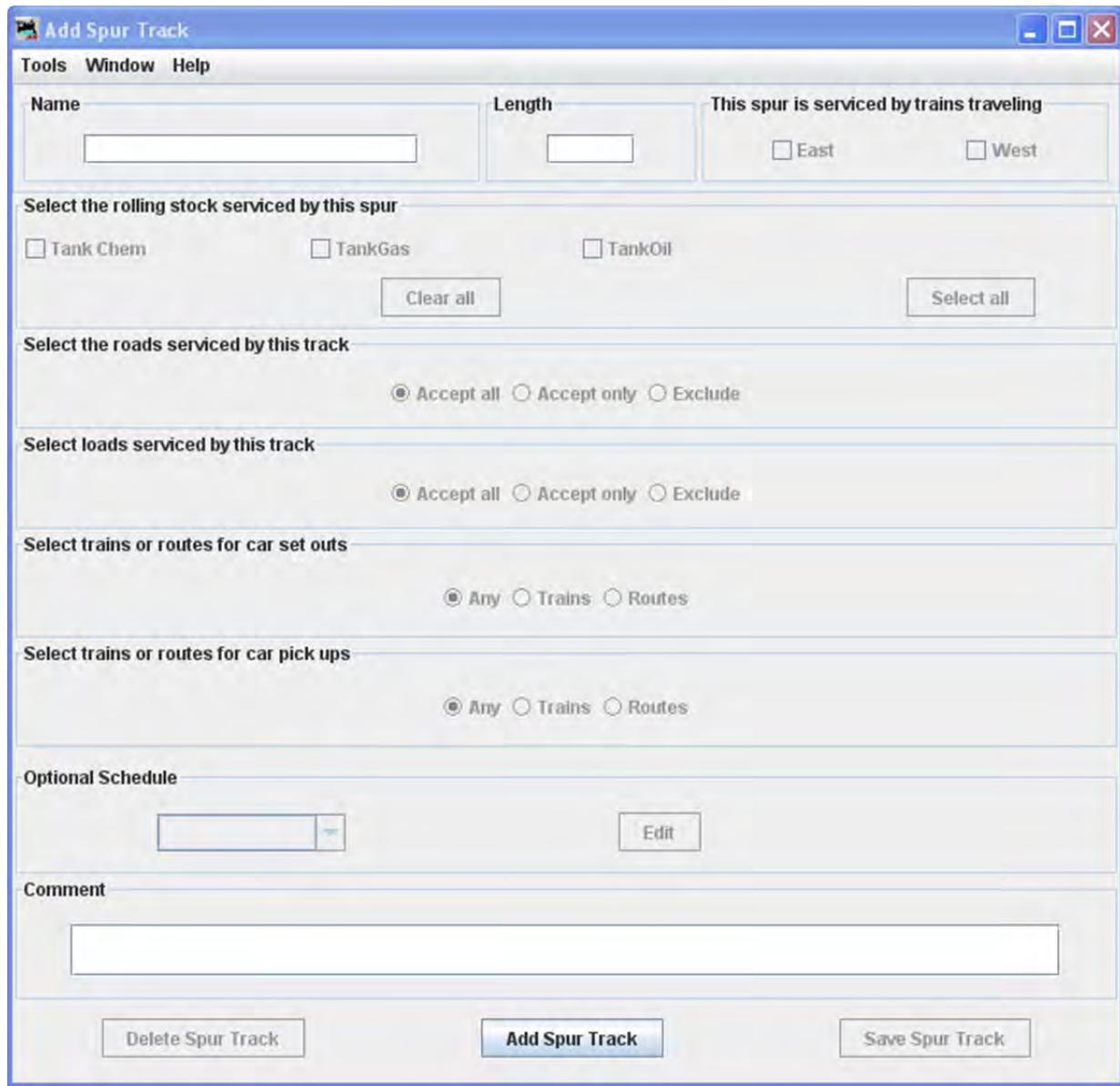
Next **Select the rolling stock serviced by this location**, note the **Clear All** button and **Select All** button may be used to select. We have used the Clear All button and then selected  **Boxcar** and  **Gondola** for this location.

You can control the rolling stock a location can service. Push Clear All button to deselect all types, or Select All button to select all types, then select or deselect the rolling stock you wish the location to accept.

Since the **Operations at this location** is a  **Spurs** the **Add Spurs Track** button is now enabled near the bottom of the window.

We also have the option to **Delete Location** button or **Save Location** button

Press the **Add Spur Track** button then the **Add Spur Track** window is displayed, so that you can detail the spur

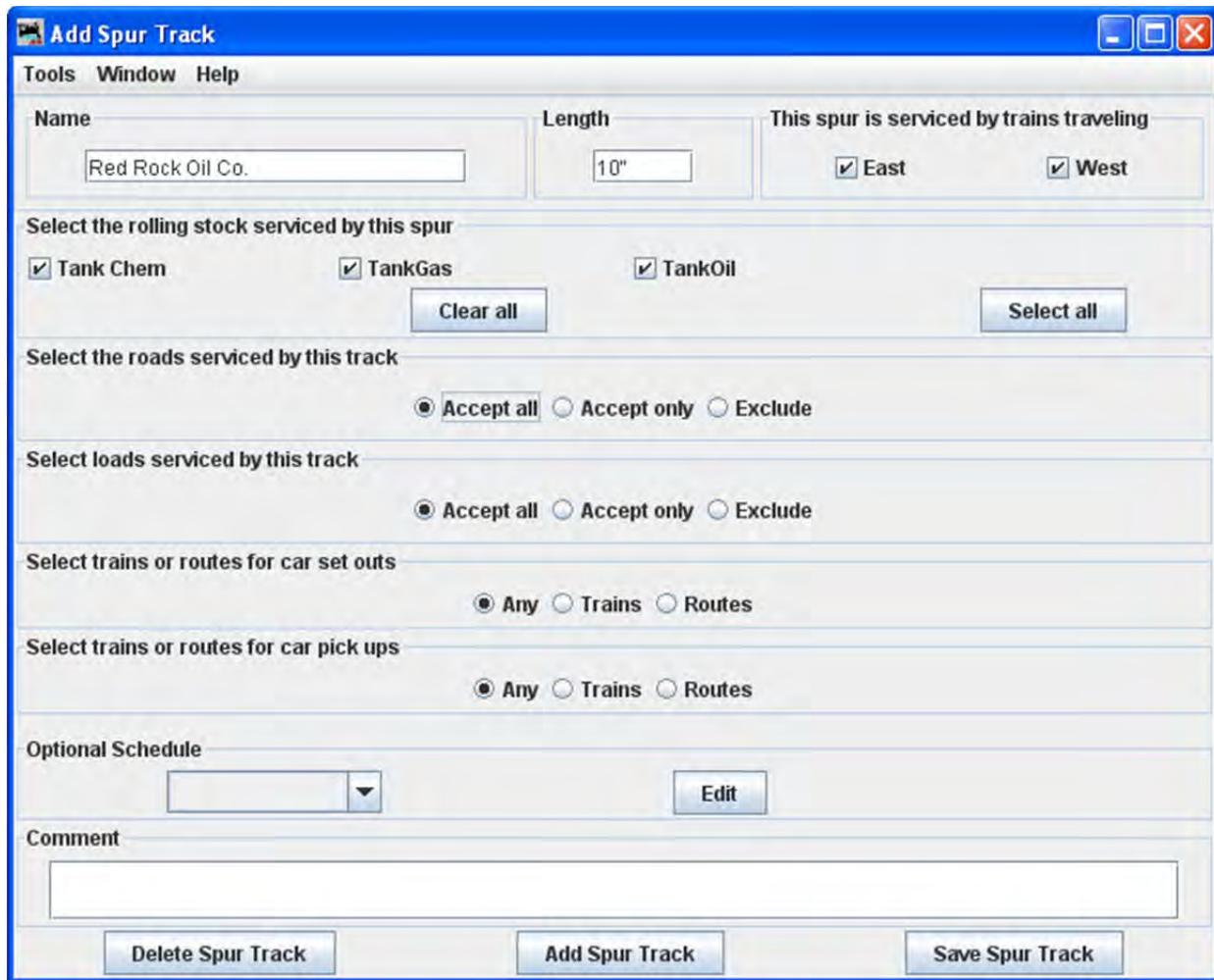


In **Name**  type the specific siding track to be serviced at this location.

**Length**  of the siding track in scale feet. You may enter the measurement in actual inches as  and the program will convert to the scale feet that you select during setup.

Press **Add Spur Track** button the siding track is added and the greyed out features are activated.

**Add Spur Track** window now displays with all options active to let you detail the spur.



### SELECT THE ROLLING STOCK SERVICED BY THIS SPUR

Only those items selected in the previous location window will be displayed. The program uses those that are checked. **Clear All** button unchecks all rolling stock. Now you may select any you require or press the **Select All** button to check all the rolling stock.

### SELECT THE ROADS SERVICED BY THIS TRACK

**Accept all**

Default accepts rolling stock from any railroad.

**Accept only**

Allows you to list the railroads whose rolling stock you will accept.



Select Road you want to add from drop-down List the press **Add Road** button repeat for each Road you would like to service this Spur. To remove Road form the Spurs select from the drop-down list then press Delete **Road** button

### **Exclude**

Similar to Accept only but creates a list of Roads that you do no want to service this location.

## SELECT LOADS SERVICED BY THIS TRACK

### **Accept all**

Default accepts any load

### **Accept only**

Allows you to list the loads that this location will accept.



Select type of load from first drop-down list (Based on the type of rolling stock accepted). From second drop-down list select either Empty or Load, the press **Add Load** button to list of acceptable loads. Repeat as necessary. Select a load then press **Delete Load** button to remove that load. You may remove all loads by pressing the **Delete All** button.

### **Exclude**

Similar to Accept only but creates a list of acceptable loads that can be serviced by this location.

## Select trains or routes for car set outs

### **any**

Default cars may be set out by any Train or Route

### **Trains**



Select Train from the drop-down List then press **Add** button to add train that may set out cars at this location. You may remove Train from list press **Delete** button.

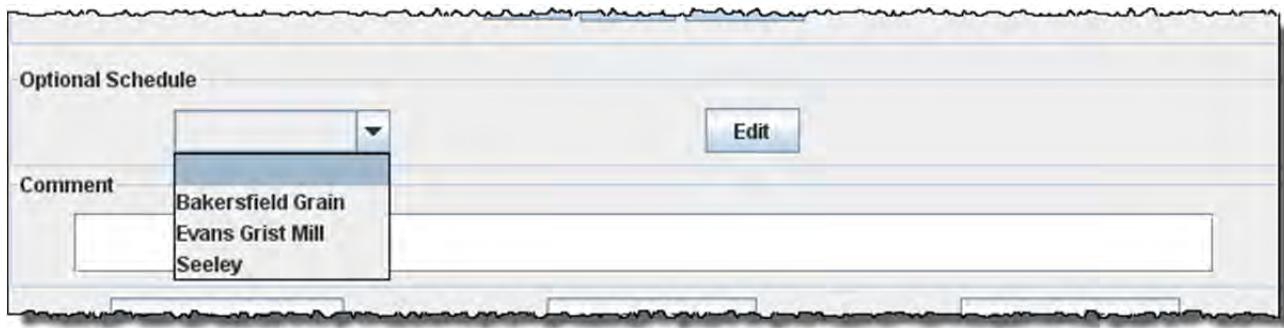
## **Routes**

Similar to Trains except you select a Route to add or remove to determine routes that may set out cars at this location.

## **SELECT TRAINS OR ROUTES FOR CAR PICK UPS**

This option is almost identical to car set outs except now car pick up options are selected.

## **OPTIONAL SCHEDULE**



Optionally, a schedule may be selected from the drop-down list. Press **Edit** button to open Add Schedule for Spur Tank Facility.

## **COMMENT**

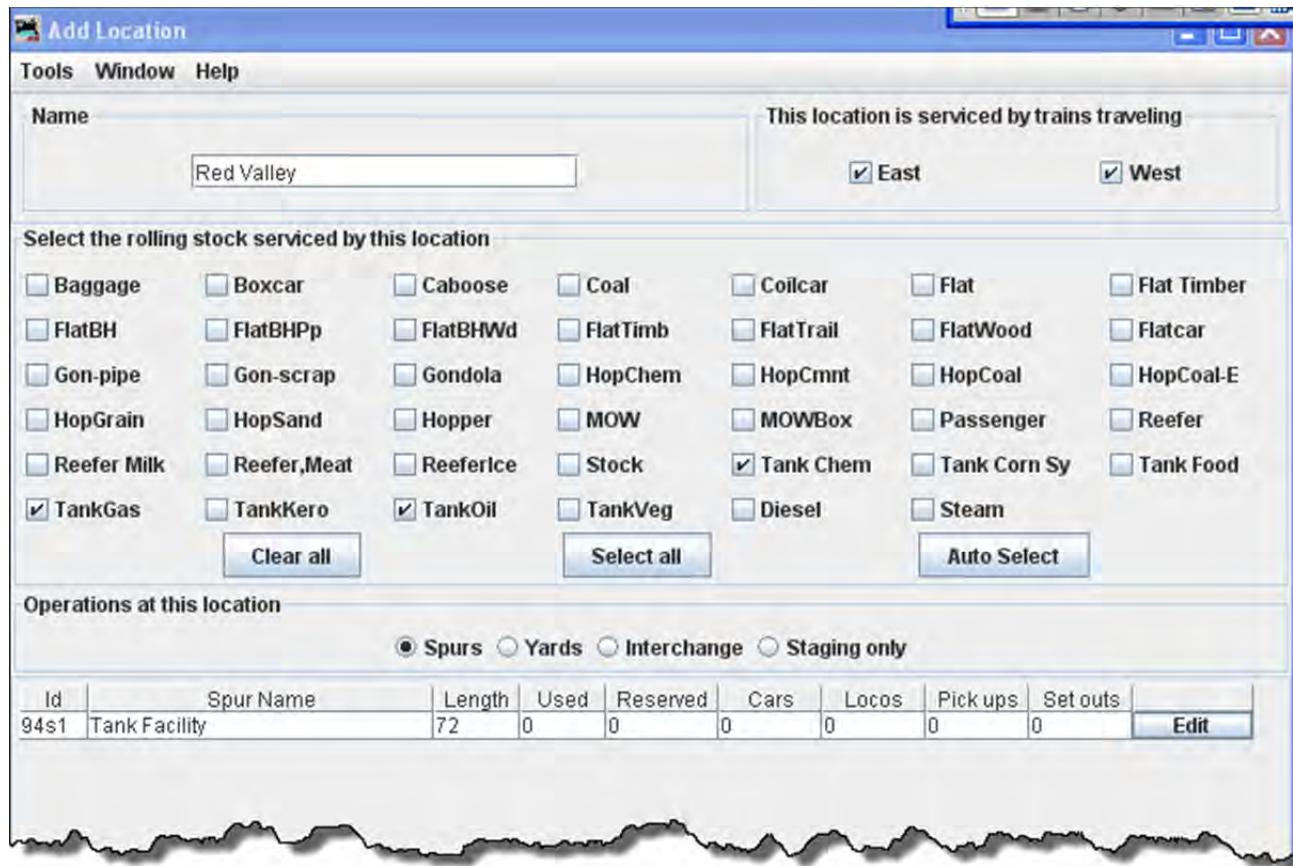
You may now press Save Spur Track button to add to the location or press Delete Spur Track button if you do not want to store the track.

If you want to add another track to this siding location, then enter new data and Press Add Spur Track button to add the track.

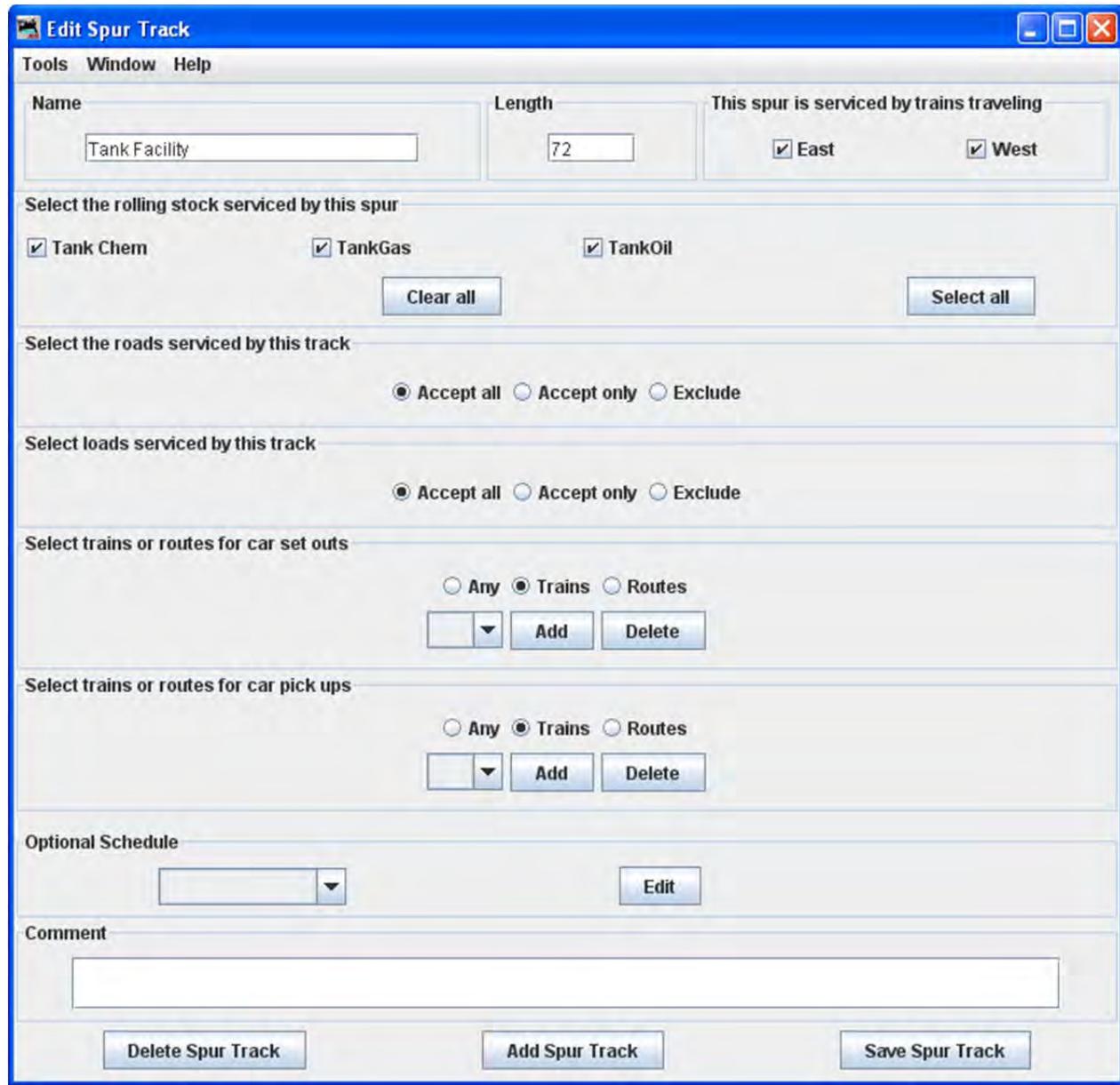
Close the window when done with this location.

# JMRI® User's Guide Version 2.12

The **Add Location** window shows one siding track at the Tank Facility in Red Valley.



If you want to change information for any track entry, press Edit button and the **Edit Spur Track** window will open.



Note that it is identical to the Add Siding Track except for the title. Change any of the entries that you want to edit and then press the Save Spur Track button to save the changes. You may also Delete Spur Track button from your data base.

When done with editing close the window.

The Locations window shows all the locations in your database.

You may Edit any one of them, which opens the **Edit Location** window, which is the same as the [Add Location](#) window except it contains the info for the location you are editing.



You may add as many locations and track as you need to complete the description of your layout.

## OPERATIONS CARS WINDOW

This window is opened from the **Location** Window **Tools** menu, **Show Cars**.

The cars window allows you to edit your car roster. You can enter a car's number, road, type, length. The program will automatically calculate the car's weight based on length and the scale you are modeling. Optionally the car's color, build date, load and owner can be added. You may want to switch a group of cars as a unit, then you create a "kernel". You can assign any number of cars to a kernel but the type of the first car assigned will be used by the program to determine if the kernel is allowed at a location. The entire length of the kernel is used to determine if the cars in the kernel will fit. Note that the program also includes space for the car's couplers when calculating the length of a kernel.(group of similar cars)

The complete roster of cars is displayed. At the bottom of the page is a series of radio buttons that allow you to select the sort order.

**Add** button opens the [Add Car](#) window and allows you to add a new car.

**Save** button saves the car roster to disk.

**Find** button  used to find a car by its road number. The wild card may be used "\*" when entering a car number. for example, if you want to find all the cars with a number ending in 345 , enter \*345 then press **Find** button each time pressed the next car with the 345 ending will be displayed..

To the right of each car entry:

**Set** button opens the [Set Car Location](#) Window.

# JMRI® User's Guide Version 2.12

Edit opens the [Edit Car](#) window, similar to the [Add Car Window](#)

The screenshot shows a Windows application window titled "Cars". The menu bar includes "Tools", "Window", and "Help". The main area is a grid table with columns: Number, Road, Type, Len, Color, Kernel, Location, Destination, Train, and Moves. The "Location" column contains entries like "Bakersfield (#80,81 Bkrsfld Oil)", "Bakersfield (Caboose Track)", "Lakeview (#96 Yard Track)", etc. The "Destination" column has entries like "Bakersfield (Caboose Track)" and "Fremont (#237 Deloge)". The "Train" and "Moves" columns show numerical values. A toolbar at the bottom includes buttons for "Add", "Save", and "Find". Below the toolbar, a status bar displays "187/210 cars".

Number	Road	Type	Len	Color	Kernel	Location	Destination	Train	Moves	Set
62897	SP	TankOil	38	Black		Bakersfield (#80,81 Bkrsfld Oil)		23		<input type="button" value="Set"/>
401	BM	Caboose...	34	Blue		Bakersfield (Caboose Track)	Lakeview (#96 Yard Track)	BL	27	<input type="button" value="Set"/>
681	NH	Caboose...	34	Black		Bakersfield (Caboose Track)	Bakersfield (Caboose Track)	BB	25	<input type="button" value="Set"/>
20048	SSW	Boxcar	50	Tuscan		Bakersfield (SP SSW Interchange)			27	<input type="button" value="Set"/>
35227	SSW	Boxcar	40	Tuscan		Bakersfield (SP SSW Interchange)			26	<input type="button" value="Set"/>
163188	SP	Boxcar	40	Silver		Bakersfield (SP SSW Interchange)			30	<input type="button" value="Set"/>
12	VN	Boxcar	40	Yellow		Bakersfield (yard)			23	<input type="button" value="Set"/>
462	C&EI	Boxcar	40	Tuscan		Bakersfield (yard)			25	<input type="button" value="Set"/>
1601	D&RGW	ReeferIce	51	Black		Bakersfield (yard)			24	<input type="button" value="Set"/>
6543	WP	Gondola	52	Black		Bakersfield (yard)			26	<input type="button" value="Set"/>
8518	FW&D	Boxcar	40	Tuscan		Bakersfield (yard)			24	<input type="button" value="Set"/>
10407	ATSF	Boxcar	50	Tuscan		Bakersfield (yard)	Fremont (#237 Deloge)	LS	21	<input type="button" value="Set"/>
25255	SAL	Boxcar	40	Silver		Bakersfield (yard)			31	<input type="button" value="Set"/>
45938	SOO	Boxcar	40	Red		Bakersfield (yard)			26	<input type="button" value="Set"/>
60133-2	CRR	HopCmnt	36	Black		Bakersfield (yard)			25	<input type="button" value="Set"/>
63507	PFE	ReeferIce	40	Orange		Bakersfield (yard)			21	<input type="button" value="Set"/>
66002	NKP	Gondola	52	Black		Bakersfield (yard)			25	<input type="button" value="Set"/>
88044	LN	Stock	40	Tuscan		Bakersfield (yard)	Port Arthur (#46 Farmers Stock)	SL	20	<input type="button" value="Set"/>
135357	PRR	Stock	50	Tuscan		Bakersfield (yard)			27	<input type="button" value="Set"/>
306705	C&O	Colicar	53	Yellow		Bakersfield (yard)			24	<input type="button" value="Set"/>
5708	PFE	ReeferIce	40	Orange	Reefer A*	Bakersfield (yard)			24	<input type="button" value="Set"/>
25878	PFE	ReeferIce	40	Orange	Reefer A	Bakersfield (yard)			24	<input type="button" value="Set"/>
25960	PFE	ReeferIce	40	Orange	Reefer A	Bakersfield (yard)			24	<input type="button" value="Set"/>
26053	PFE	ReeferIce	40	Orange	Reefer A	Bakersfield (yard)			24	<input type="button" value="Set"/>
63541	PFE	ReeferIce	40	Orange	Reefer C	Bakersfield (yard)			24	<input type="button" value="Set"/>

Sort by  Number  Road  Type  Color  Load  Kernel  Location  Destination  FD  RWE  Train  Moves  Built  Owner

187/210 cars

## MENU BAR

## TOOLS

- **ROSTER -->**
  - **Import from File**  
Opens the [Open](#) dialog box, to import a roster of cars if you already have a list of cars in a database. The import function requires an ACSII text file, with one line for each car. The car import requires four attributes and the order is car number, road name, type, and length. An example of a correct format:

**336 GCR Flat 40**

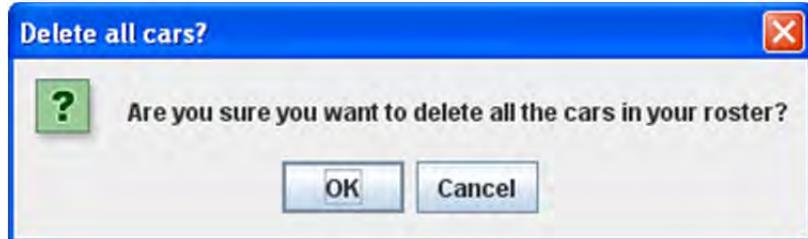
**655579 UP Boxcar 40**

Optionally you may include additional attributes in the following order: weight, color, owner name, date built, and location. Check the Windows help file for further information.

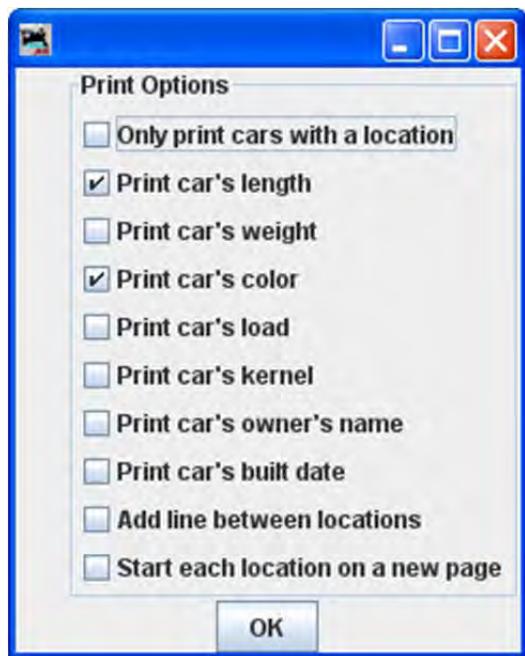
- **EXPORT TO FILE**



- **DELETE ALL CARS**



- **PRINT**

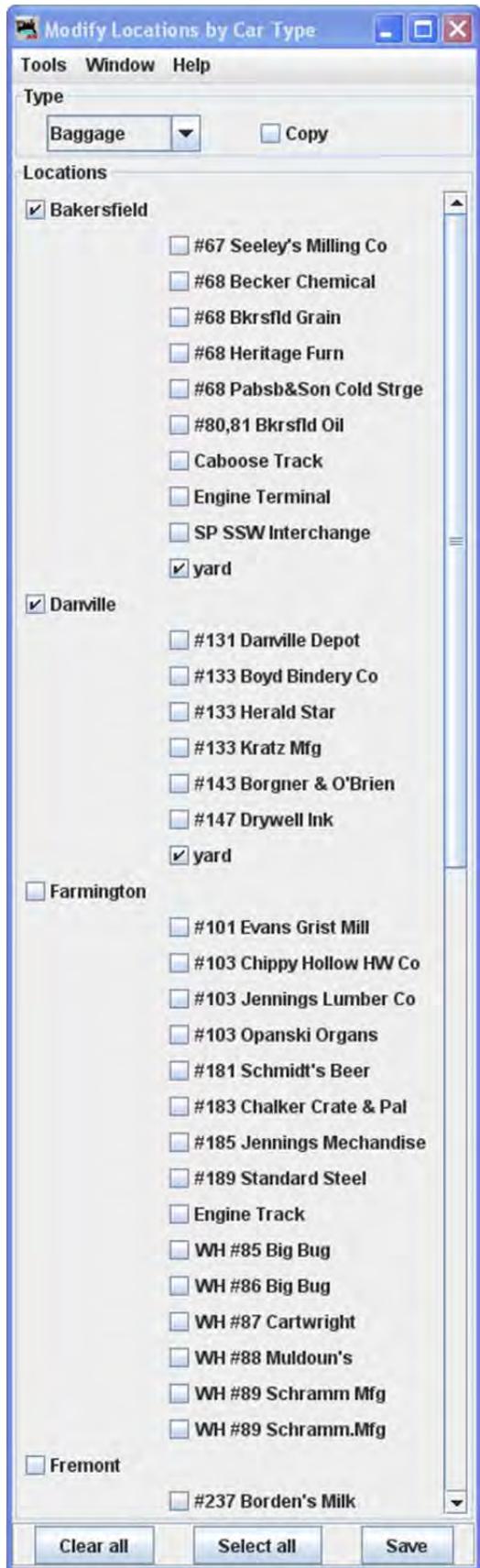


- **Print Preview**

Print options dialog displays, opens output in printer preview window.

## MODIFY LOCATIONS BY CAR TYPE

This tool can open from the **Locations** window **Tool** menu. Use this tool to quickly modify the type of cars your locations and tracks will service. Very useful when adding a new car type to your roster.



## Menu Bar

### Tool

- **Print Locations by Car Type**  
Opens system printer dialog
- **Preview Locations by Car Type**  
Opens the list in printer preview window

### Window

### Help

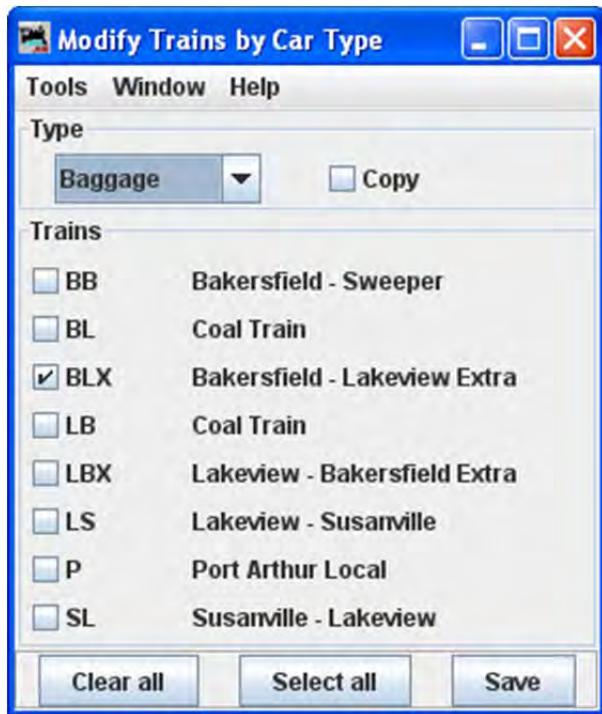
First select the car type you wish to modify from the drop-down list. When the type is selected notice that all cars of that type at the locations selected will be checked.

Select or deselect the locations and tracks you want to service, and press to modify your locations and tracks.

You can also  **Copy** how an existing car is serviced by your locations and apply those rules to another car. To make a car behave like another, first select the car you would

like to copy, then select the  **Copy**, the car type will now appear to the right of the checkbox, then select the type of car you want to modify, and press to have both car types serviced by the same locations and tracks.

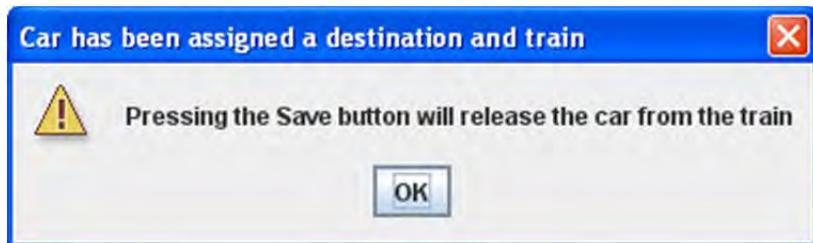
## MODIFY TRAINS BY CAR TYPE

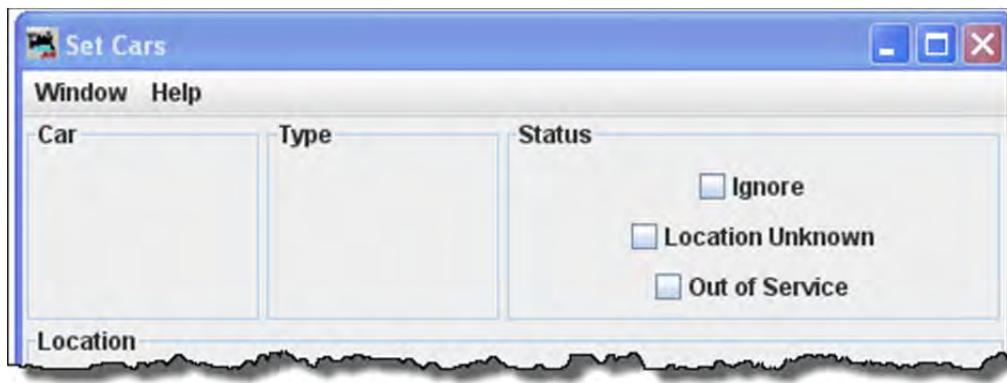


## SET CARS

You can select the **Set Cars** from the [Cars](#) window **Tools** menu. This allows you to change the location, destination, status, or train assignment for a group of cars. This tool works the same as the **Set Car Location** tool as described below, except that multiple cars are modified. Select the cars you want in the table and then select **Set Cars**. The first selected car becomes the default, and if you press Change button, all of the other selected cars will have the same settings as the default car. Be sure to press Save button in the [Cars](#) window if you want to keep your changes.

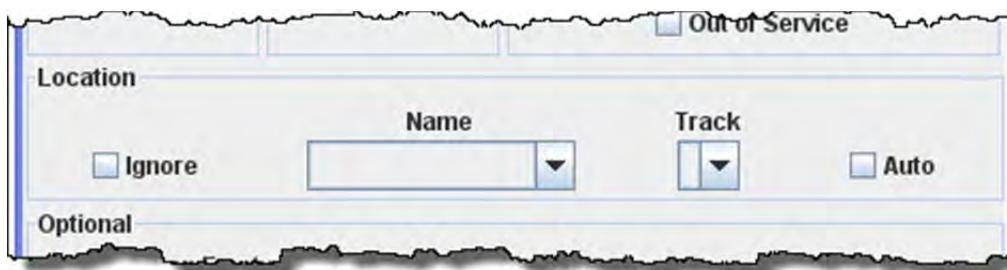
Displays when **Set Cars** window opens. This warns that when you Save the changes from the **Set Cars** window those cars are no longer part of a train.





### Status

- Ignore**
- Location Unknown** results in: program will ignore the car when building a new train; on manifests and switch lists, the program will list the car as misplaced. This selection disables all other selections in this window.
- Out of Service** when selected instructs the program to ignore the car when building new trains. Many operators have a RIP (Repair in Place) track and use this feature to hold the car there until repairs have been completed.



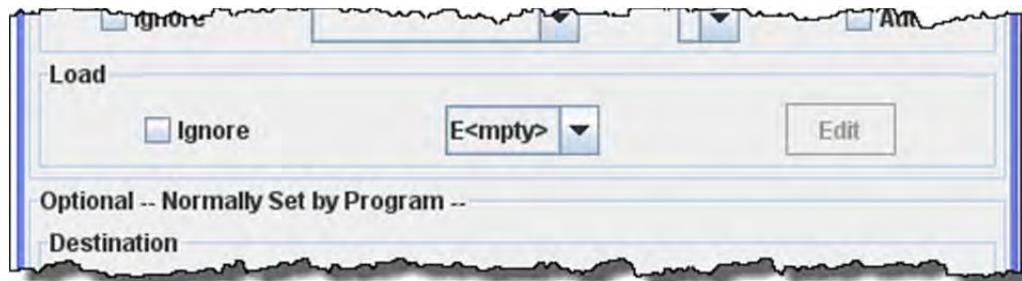
### Location

Use the location set to place the car on the layout.



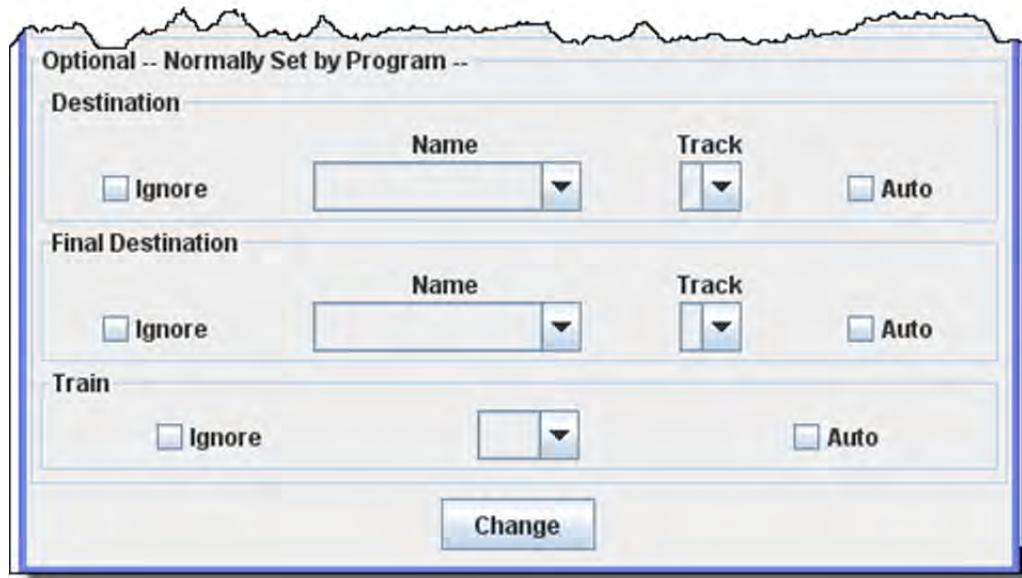
## Return When Empty

Enter location to return the car to when empty.  **Auto** shows valid track for a given location.



## Load

You may also change the cars load.

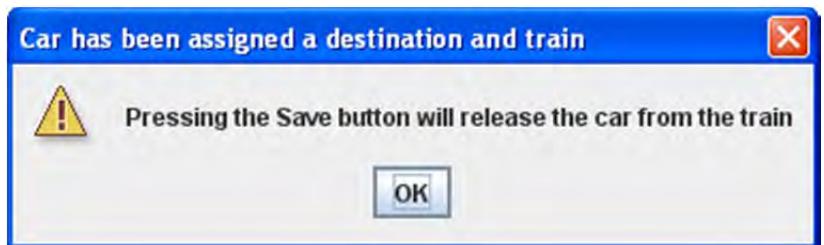


## Optional--Normally Set by Program

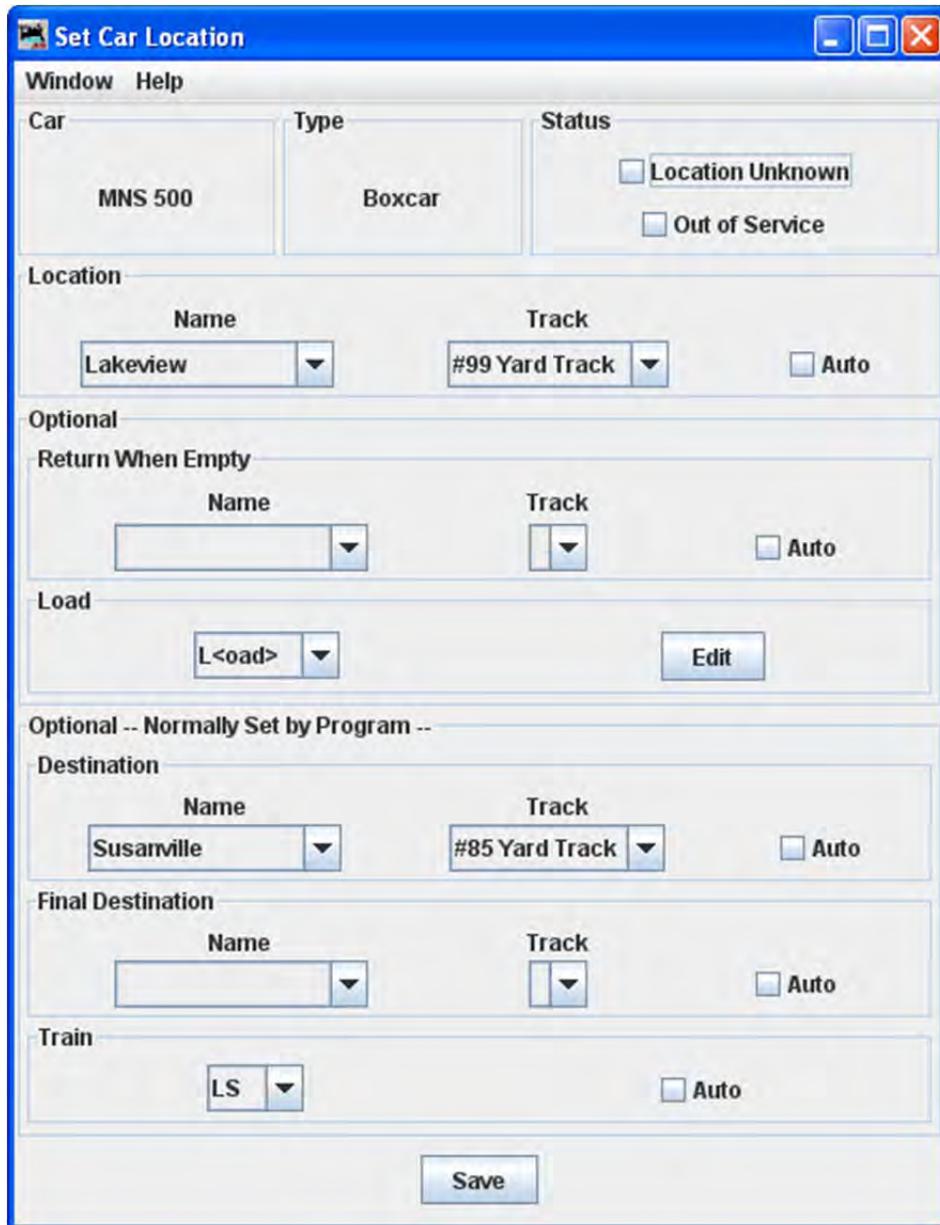
See window help

After creating a car, you can set the car's location, and optionally the car's destination and train by using the found for each car in the **Cars** window. Normally the car's destination and assigned train are generated by the program, but you can use this window and its options to force a car to specific location using a specified train.

Dialog displays when **Set Cars Location** window opens. This warns that when you Save the changes from the **Set Cars Location** window those cars are no longer part of a train.



Displays with data shown



#### OPERATIONS LOCOMOTIVE WINDOW

# JMRI® User's Guide Version 2.12

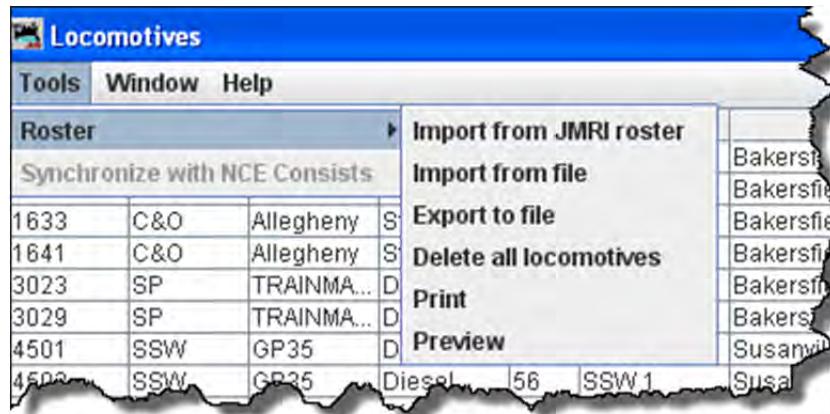
The Locomotives window allows you to edit your engine roster. You can enter an engine's number, road, model, type, and length. You can optionally add the engine's build date and owner. If you want a group of engines to be assigned as a unit, you can create a "consist". The engine type is used by the program to determine where engines are picked up and or stored at the various locations on your layout. Some of default engine types are electric, diesel, gas turbine, and steam.

Number	Road	Model	Type	Len	Consist	Location	Destination	Train	Moves	Set	Edit
1017	SP	SW1200	Diesel	45		Bakersfield (Engine Terminal)			18	<a href="#">Set</a>	<a href="#">Edit</a>
1019	SP	SW1200	Diesel	45		Bakersfield (Engine Terminal)	Bakersfield (Engine Terminal)	BB	18	<a href="#">Set</a>	<a href="#">Edit</a>
1633	C&O	Allegheny	Steam	125		Bakersfield (Engine Terminal)			0	<a href="#">Set</a>	<a href="#">Edit</a>
1641	C&O	Allegheny	Steam	125		Bakersfield (Engine Terminal)			0	<a href="#">Set</a>	<a href="#">Edit</a>
3023	SP	TRAINMA...	Diesel	66	nce_106	Bakersfield (Engine Terminal)	Lakeview (#96 Yard Track)	BL	38	<a href="#">Set</a>	<a href="#">Edit</a>
3029	SP	TRAINMA...	Diesel	66	nce_106*	Bakersfield (Engine Terminal)	Lakeview (#96 Yard Track)	BL	38	<a href="#">Set</a>	<a href="#">Edit</a>
4501	SSW	GP35	Diesel	56	SSW 1*	Susanville (#84 Yard Track)			7	<a href="#">Set</a>	<a href="#">Edit</a>
4503	SSW	GP35	Diesel	56	SSW 1	Susanville (#84 Yard Track)			7	<a href="#">Set</a>	<a href="#">Edit</a>
4545	SSW	GP35	Diesel	56	SSW 2*	Lakeview (#99 Yard Track)	Susanville (#85 Yard Track)	LS	11	<a href="#">Set</a>	<a href="#">Edit</a>
4546	SSW	GP35	Diesel	56	SSW 2	Lakeview (#99 Yard Track)	Susanville (#85 Yard Track)	LS	11	<a href="#">Set</a>	<a href="#">Edit</a>
4802	SP	TRAINMA...	Diesel	66	nce_118	Lakeview (#97 Yard Track)	Bakersfield (Engine Terminal)	LB	49	<a href="#">Set</a>	<a href="#">Edit</a>
4805	SP	TRAINMA...	Diesel	66	nce_118*	Lakeview (#97 Yard Track)	Bakersfield (Engine Terminal)	LB	49	<a href="#">Set</a>	<a href="#">Edit</a>
5010	SP	GP30	Diesel	56		Port Arthur (#165 Service)	Port Arthur (#165 Service)	P	23	<a href="#">Set</a>	<a href="#">Edit</a>
5151	SP	RS18	Diesel	52	nce_127	Susanville (#83 Yard Track)	Lakeview (#94 Yard Track)	SL	17	<a href="#">Set</a>	<a href="#">Edit</a>
5160	SP	RS18	Diesel	52	nce_127*	Susanville (#83 Yard Track)	Lakeview (#94 Yard Track)	SL	17	<a href="#">Set</a>	<a href="#">Edit</a>
5162	SP	RS18	Diesel	52	RS18s*	Lakeview (#98 Yard Track)	Bakersfield (Engine Terminal)	LBX	20	<a href="#">Set</a>	<a href="#">Edit</a>
5166	SP	RS18	Diesel	52	RS18s	Lakeview (#98 Yard Track)	Bakersfield (Engine Terminal)	LBX	20	<a href="#">Set</a>	<a href="#">Edit</a>
5294	SP	RSD4	Diesel	52	nce_115*	Port Arthur ()	Lakeview (#95 Yard Track)	BLX	29	<a href="#">Set</a>	<a href="#">Edit</a>
5307	SP	RSD4	Diesel	52	nce_115	Port Arthur ()	Lakeview (#95 Yard Track)	BLX	29	<a href="#">Set</a>	<a href="#">Edit</a>

Sort by  Number  Road  Model  Consist  Location  Destination  Train  Moves  Built  Owner

19 locomotives [Add](#) [Save](#) [Find](#)

## MENU BAR



## TOOLS

ROSTER ➔

IMPORT FROM JMRI ROSTER

## JMRI® User's Guide Version 2.12

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If you already have a [DecoderPro® roster](#) created when programming decoders, you may import them into the Operations program. All locomotives that are not already in your Operations roster will be imported and a message will be displayed informing you of how many locomotives were imported. This way you can use this tool any time you add locomotives to your DecoderPro® locomotive roster. The DecoderPro® locomotive roster doesn't have the locomotives length, so a default length is entered for you. You should correct the locomotive length if you want the program to correctly calculate your train lengths.

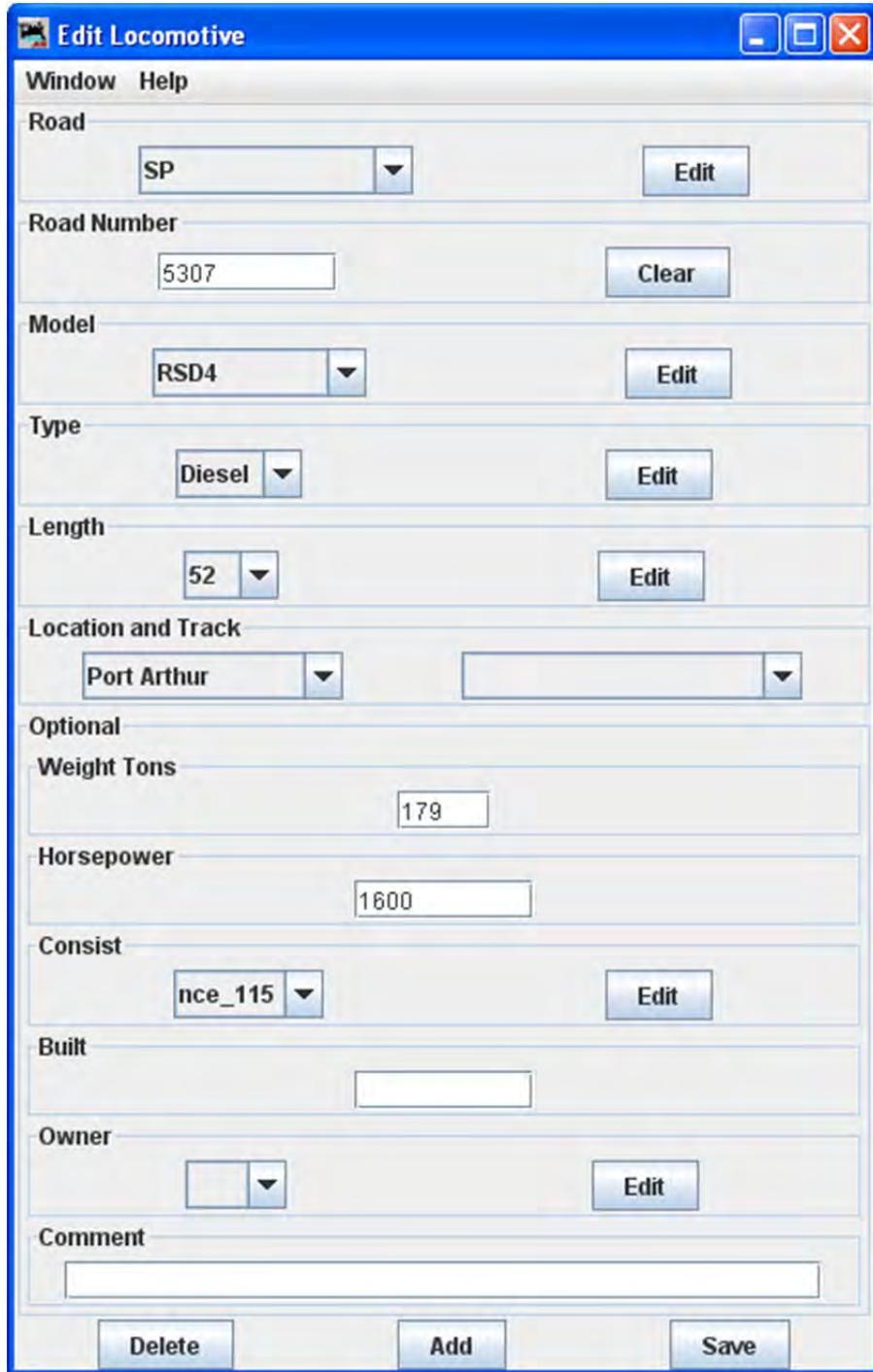
Now we should have imported your programming engine roster into the Operations Engine roster you will need to edit the entries to add the attributes that are required for operations but were not needed in the Engine Roster file when you programmed the recorders.

The screenshot shows the 'Engines' window of the JMRI software. The window title is 'Engines'. The menu bar includes 'Tools', 'Window', and 'Help'. The main area is a grid table with columns: Number, Road, Model, Type, Len, Consist, Location, Destination, Train, Moves, and Location. Below the table is a 'Sort by' dropdown menu with options: Number (selected), Road, Model, Consist, Location, Destination, Train, Moves, Built, and Owner. At the bottom of the window are buttons for 'Add', 'Find', and a search input field. A status bar at the bottom left says '57 engines'.

Number	Road	Model	Type	Len	Consist	Location	Destination	Train	Moves	Location	
1	Electro-M...	SD60	Engine	50				0	Set	Edit	
5	AMTRAK	P42	Engine	50				0	Set	Edit	
11	AMTRAK	P42	Engine	50				0	Set	Edit	
34	AMTRAK	P42	Engine	50				0	Set	Edit	
52	AMTRAK	P42	Engine	50				0	Set	Edit	
84	AMTRAK	P42	Engine	50				0	Set	Edit	
100	Santa Fe	FP45	Engine	50				0	Set	Edit	
107	Santa Fe	FP45	Engine	50				0	Set	Edit	
300	Santa Fe	F7A	Engine	50				0	Set	Edit	
333	AMTRAK		Engine	50				0	Set	Edit	
...											

These engines were imported from JMRI Roster, so we will need to edit them to set the correct length, Consist, Location as required.

Press Edit button to the right of the engine that you wish to edit and the [Edit Engine](#) window is opened



I now edit the **Road** to SP using drop-down menu which was in the roster as Union Pacific  
**Road Number** was imported correctly.

**Model** was imported correctly

**Type** was not in Roster so set using drop-down menu

**Length** was set to default so edit to the correct length of body not including couplers using drop-down menu.

**Horsepower** was not imported, so set to  as this model was basically two 2500 HP units on a single frame.

# JMRI® User's Guide Version 2.12

**Location** is not imported from the Roster, So I located the locomotive at North Yard using drop-down menu and set on Track2 using drop-down menu.

## Optional

**Consist** not set.

**Built** not entered.

**Owner** is not imported, so selected from drop-down menu .

No **Comment** for this locomotive

Now to store press Save button and this will add the edits to any edited menu item.

Add button updates your Operations Locomotive Roster.

Take a look at the Edited Operations Locomotive Roster, note the highlighted entry which we just edited

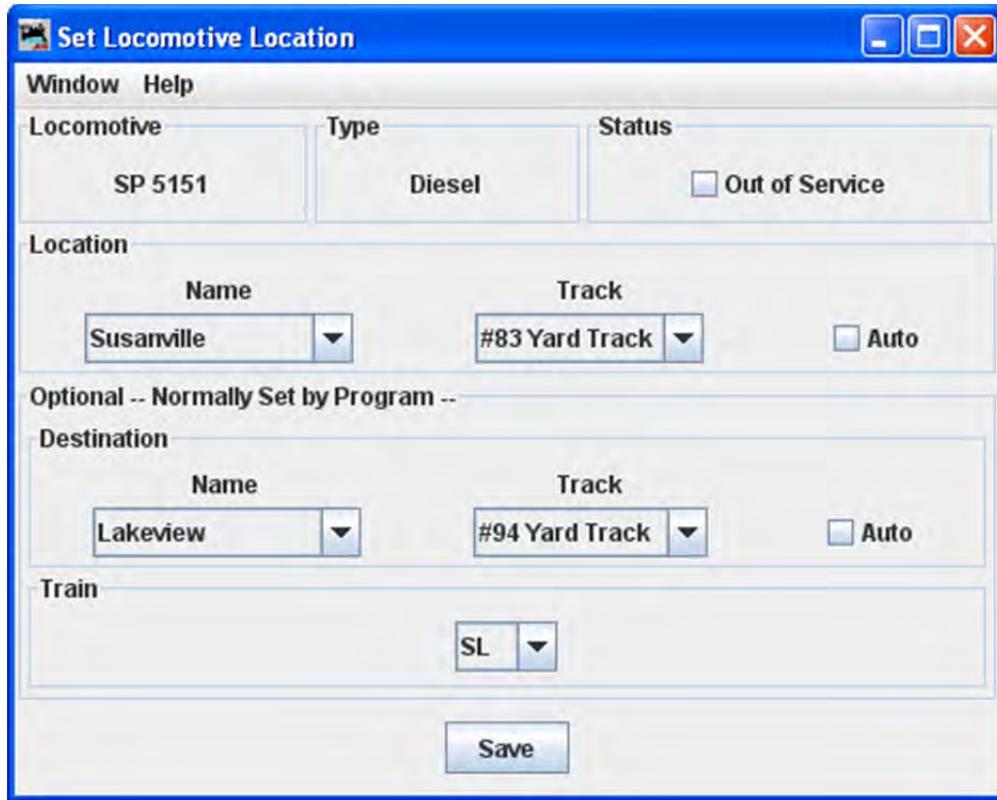
Number	Road	Model	Type	Len	Consist	Location	Destination	Train	Moves	Location	Edit
6018	Souther...	E8/9A	Engine	50					0	Set	Edit
6046	Souther...	E8/9A	Engine	50					0	Set	Edit
6340	BNSF	SD40-2	Engine	50					0	Set	Edit
6365	Santa Fe	B23-7	Engine	50					0	Set	Edit
6390	Santa Fe	B23-7	Engine	50					0	Set	Edit
6514	BNSF St.	SD45-2	Engine	50					0	Set	Edit
6932	UP	DD40X	Diesel	95		North Yard (Track2)			0	Set	Edit
7412	Santa Fe	Dash 8-4...	Engine	50					0	Set	Edit
7428	Santa Fe	Dash 8-4...	Engine	50					0	Set	Edit
8017	Santa Fe	C30-7	Engine	50					0	Set	Edit

Sort by  Number  Road  Model  Consist  Location  Destination  Train  Moves  Built  Owner

57 engines

The Set button to the right of selected locomotive, when pressed, opens the Set Locomotive Location window and allows you to override the program and set an locomotive at a location that is defined in your Operations data base. Dialog precedes the Set Locomotive window





Press Save button to save the locomotive locations that you have set.

Close the window when completed.

#### **IMPORT FROM FILE**

The import from file function requires an ACSII text file, with one line for each locomotive. The import order is locomotive number, locomotive road name, locomotive model, and locomotive length. The following shows two examples of the correct format:

236 UP RS4 40  
5578 SP SW1200 42

Each line can start with a space and multiple spaces between fields is okay. Optionally you can include additional information in the following order, owner name, date built, and location. The location can have two fields, the location name followed by the location's siding or yard name separated by a hyphen. The following shows two examples of the correct format:

236 UP RS4 40 AT 1930 Home Town USA - locomotive Terminal  
5578 SP SW1200 42 DB 1934 York - York locomotive Yard

If you prefer to use comma delimiters instead of spaces, place the word "comma" at the start of your import file and use commas instead of spaces. The following are two examples of importing locomotives with comma delimiters.

comma

236,UP,RS 4,40,AT,1930,Home Town USA,-,locomotive Terminal  
5578,SP,SW 1200,42,DB,1934,Town of York,-,York locomotive Yard

You need to be very careful with spaces when importing a comma delimited file. The program will include leading and trailing spaces if they exist between the commas.

Note that the program will only add locomotives that don't exist in the program's locomotive roster. If the locomotive already exists, it will be skipped by the program.

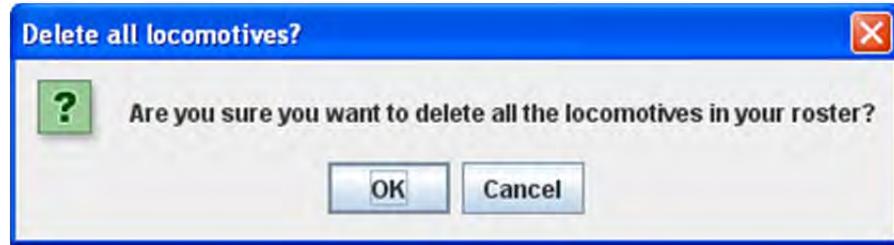
After importing your locomotives, you must save them if you want to keep them as part of your roster then edit them as you done for imports from the programming roster above.. Select any locomotive in the **locomotive** window by pressing Edit button and then press Save button that can be found at the bottom right of the **Edit locomotive** window

#### EXPORT TO FILE

Displays the Export complete dialog. The file is exported automatically as a .csv file.



**DELETE ALL LOCOMOTIVES** -- Opens the **Delete all locomotives?** OK will delete all locomotives in the Operations Roster , cancel will abort the deletion.



**PRINT** -- Opens your computers **Print** window and will print your locomotive roster.

**PREVIEW** -- Opens your computers **Print Preview** window and shows the preview of your locomotive roster.

**WINDOW** -- same as other JMRI® menus.

**HELP** -- same as other JMRI® menus.

#### *Body of window*

**Sort by** -- select the radio button for the attribute you wish to sort by.

Add button when selected opens the [Add Locomotive](#) window.

THE ADD LOCOMOTIVE WINDOW is displayed.



The Add Locomotive's Window and Help menus are the standard JMRI® menus used on most windows.



Select the Road from drop-down menu for the engine. If the desired road doesn't exist, press Edit button opens the [Edit Locomotive Attributes](#) dialog for Road.

To the right of each of the Locomotive attributes (**Road, Model, Type, Length, Horsepower, Consist, Owner**) Edit dialog to allow you to edit the list of attributes available to us for an Locomotive definition. Use this to Add button, Delete button or Replace button the available attributes for an locomotive.

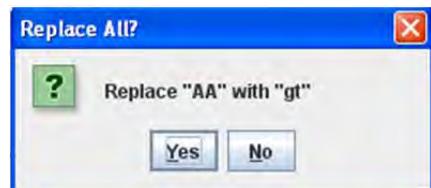


Add button to add a new locomotive attribute, enter the desired text in the text box and press Add button. When you first enter a new locomotive attribute it will show up at the start of the list. Later when your restart the program it will be sorted in the correct order.

Delete button deletes a locomotive attribute, select the attribute you want to delete in the

menu box and press Delete button.

Replace button is used if you need to change a specific locomotive attribute (road, Model, type, etc.) in your entire locomotive roster, you can use the Replace button found at the bottom right of the edit locomotive attribute panel.



For example, if you wish to change the locomotive road name attribute "UP" to "UPS" for all of your cars. Press Replace for any of your cars in the Cars panel, and the Replace All? dialog will display with a Yes or No option. Enter the new road "UPS" in the text box, select "UP" in the menu box, and press Replace button. All cars with "UP" as their road will now have "UPS" as their road name.



The program allows you organize your engines by model. Each model can only have one engine type, length, weight and horsepower rating associated with it. For example, if you assign the model name "RS11" to a set of locomotives,

when you change the length of one of the "RS11"s, the length will also change for the others



Now select the locomotive's **Type** from the drop-down menu, if the type you need is not in the list then press Edit button and the [Edit Locomotive Attributes](#) dialog for type will open.



Now select the locomotive's **Length** from drop-down menu, if the length you need is not in the list then press Edit button and the [Edit Locomotive Attributes](#) dialog for Length will open.



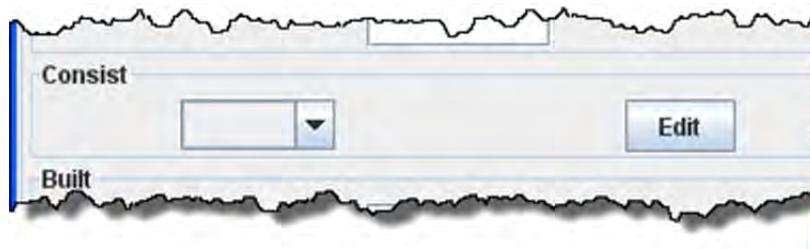
Select the locomotive's location from drop-down menu and the locomotive's track from drop-down menu.



Optional: Enter the weight of the locomotive in tons



Now enter the engine's **Horsepower**. The locomotive's horsepower, the train's weight, and track grade is used by the program to calculate how many engines are required when using the "Auto" feature when building trains.



If you wish this locomotive to be part of an **Optional Consist** from drop-down menu, press Edit button which opens the



where you may enter a consist name. Then select the consist name from the drop-down List.

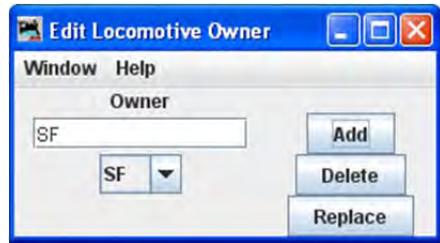
**SYNCHRONIZE WITH NCE CONSISTS**  
If you are using NCE as your DCC command station, you can have the program synchronize your consist numbers with your locomotives. The program will read all of the consists out of the NCE system and then will search for matching locomotives in your operations roster. The program will assign the consist name nce\_xxx where xxx is the consist number. To synchronize your consists, select "Synchronize with NCE Consists" under the "Tools" menu.



You may enter the optional **Built** date



**Owner** selected from drop-down menu, if the owner's name is not in the list press Edit button which opens



where you may enter the owner's name.  
Then select the Owner name from the  
drop-down list.



Add button to add another engine.



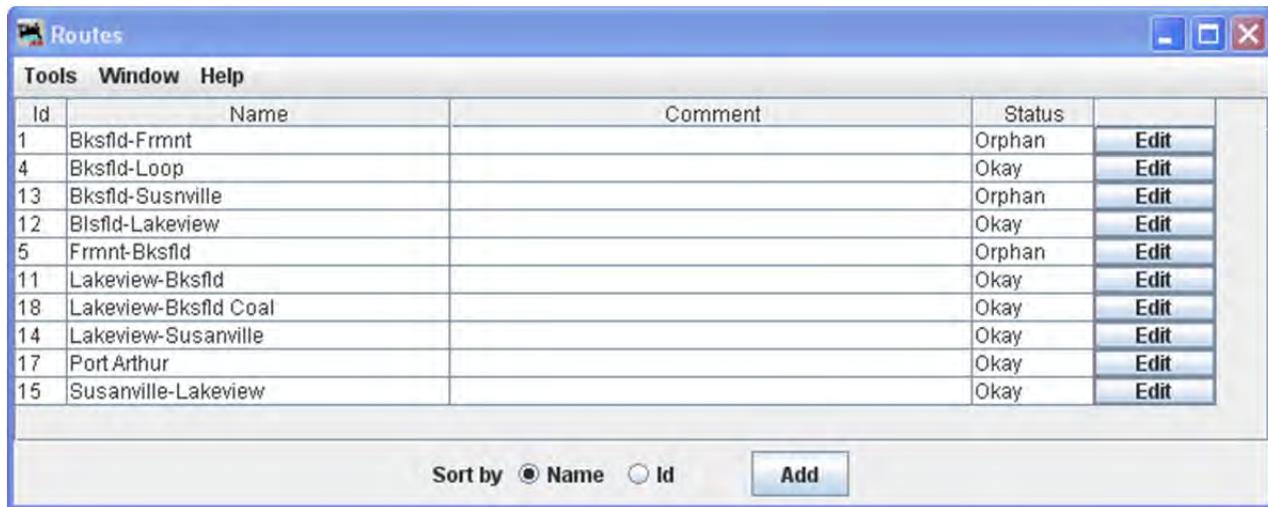
Delete button to delete an engine.

Save button to store the engine's settings. The program will create a file (OperationsEngineRoster.xml) in your JMRI directory in a folder called "operations". A backup file with the last settings for all of your engines is also created each time the Save button is pressed.

Now that you have your engines stored in the roster, you will need to add [Routes](#) that your trains will use to operate on your layout.

## OPERATIONS ROUTES WINDOW

A route is a list of locations that a train will visit. Later you can decide if the train stops at a location for work. Routes can be point to point or out and back. The current Routes are shown in the **Routes** window with their status, i.e. Orphan means it has not been assigned to a train.

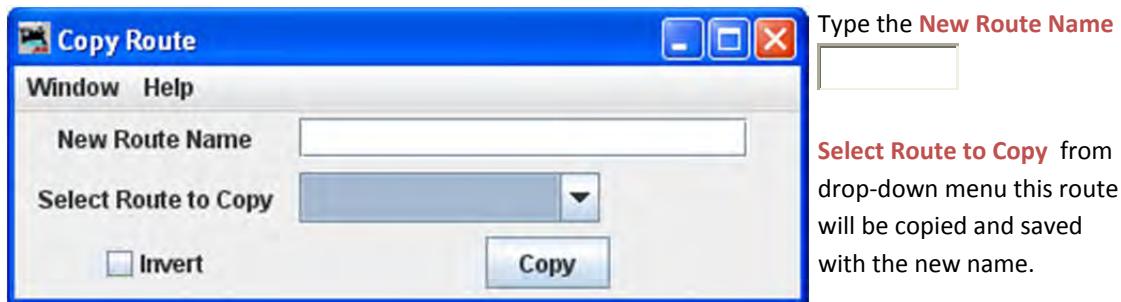


## MENU BAR



## TOOLS

- **COPY ROUTE** opens the **Route Copy** dialog. This allows you to copy an existing route.



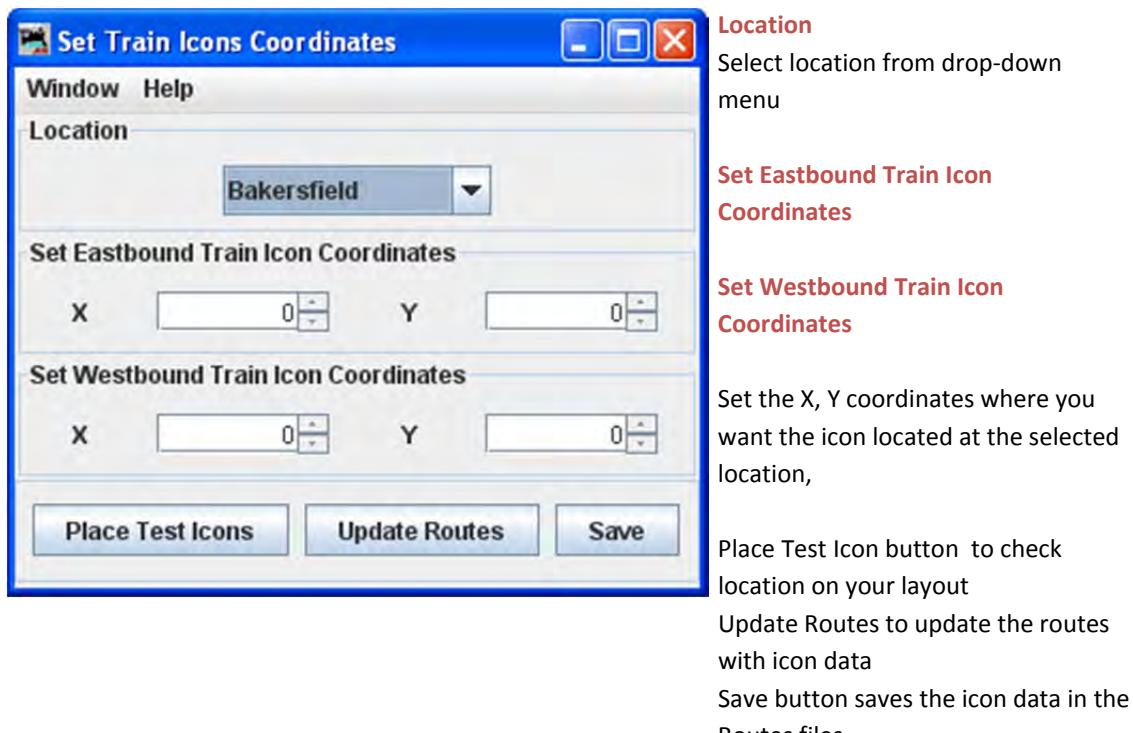
**Invert** will reverse the sequence of the route when copied.

Copy button press to copy the route into your Route

file.

- **SET TRAIN ICONS COORDINATES**

This tool is used to set the default X and Y coordinates of your train icons for each location. The tool allows you to specify the icon coordinates based on the trains direction. You can also update all of your existing routes and locations with these new coordinates. As an alternative, you can use a route's **Tools-->Set Train Icon Coordinates for this Route** to create coordinates unique to a specific route.



WINDOW -- Standard JMRI® window menu.

HELP -- Standard JMRI® Help menu.

ROUTE LIST - MIDDLE OF WINDOW

Lists routes **Id**, **Name**, **Comment**, **Status** and

BOTTOM OF WINDOW

**Sort by**  **Name**  **Id** establishes the sort order of the routes.

Add button opens the [Add Routes](#) window to allow you to add routes to your Operations data base.

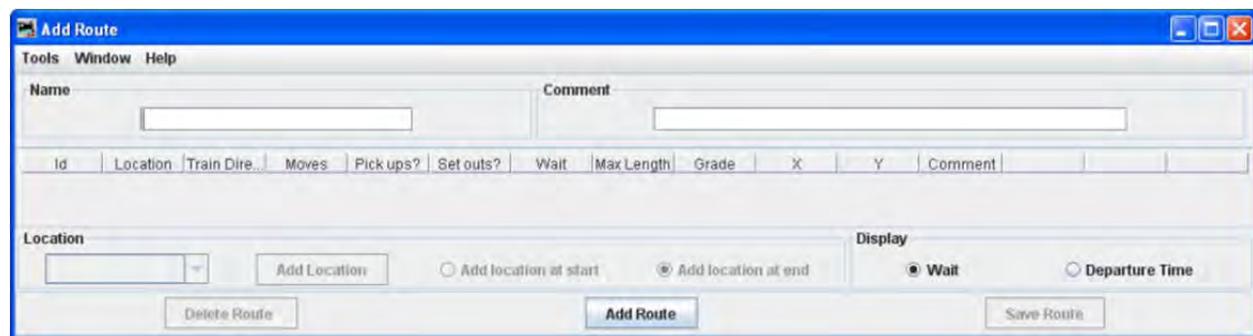
ADD OR EDIT ROUTE WINDOW

# JMRI® User's Guide Version 2.12

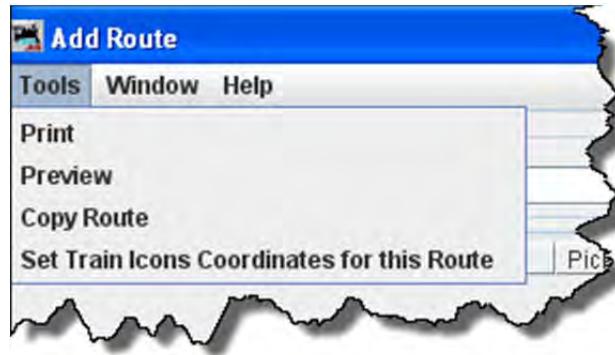
---

The **Add Route** Window opens and now you can add a route to your Operations data base.

The Edit Route Window opens and allows you to edit one of the routes. only Title bar is different

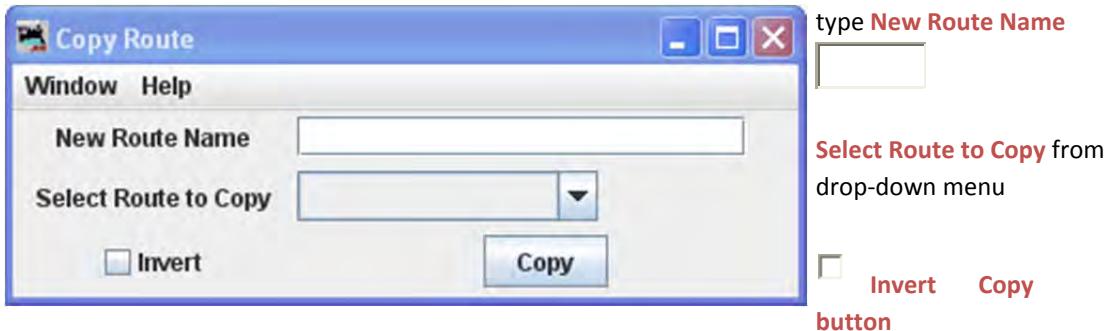


## MENU BAR



## TOOLS

- **PRINT** -- Prints your Routes.
- **PREVIEW** -- Lets you preview the Routes prior to printing.
- **COPY ROUTE**



- SET TRAIN ICONS COORDINATES FOR THIS ROUTE

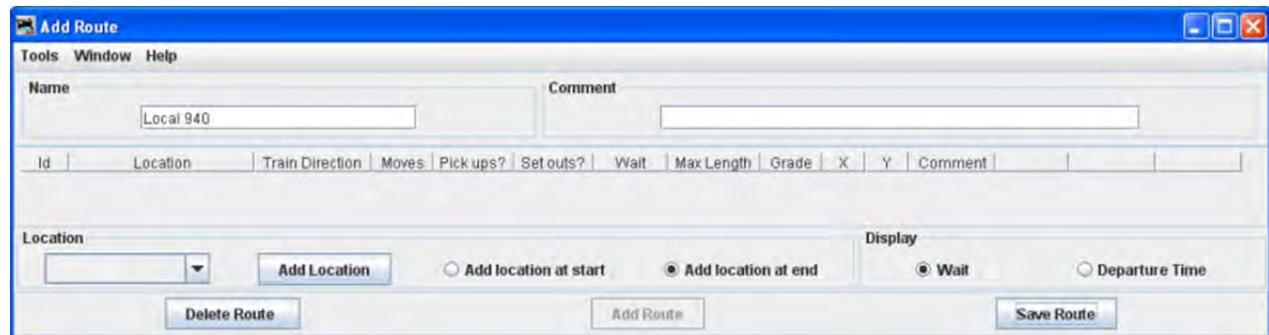
WINDOW-- Standard DecoderPro® window menu.

HELP -- Standard DecoderPro® window menu.

Now to add a route:

Type the route **Name**  . Each route must have a unique name.

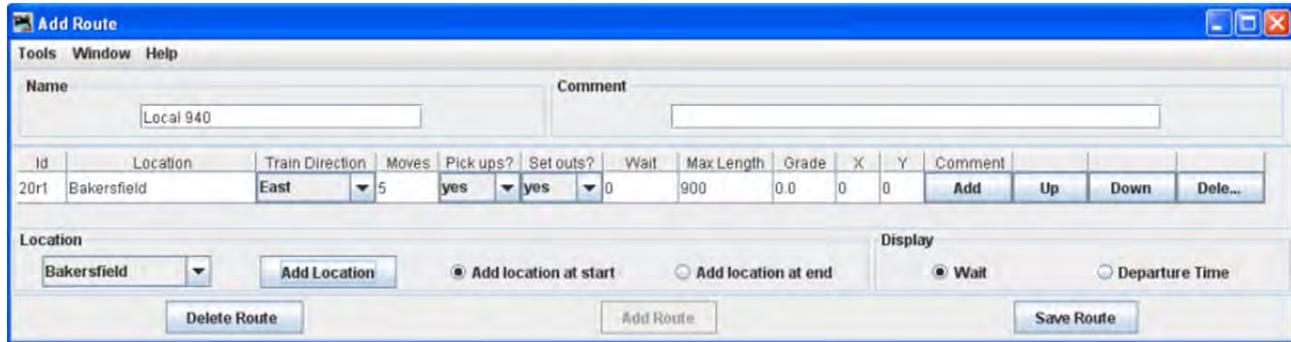
Then press Add button located at the bottom of the window. The Add Route window now activates the attributes required to enter the route.



Now select the location from which the train will depart by selecting the location from drop-down menu located at the left bottom side of the window.

Select  Add location to start  Add location at end

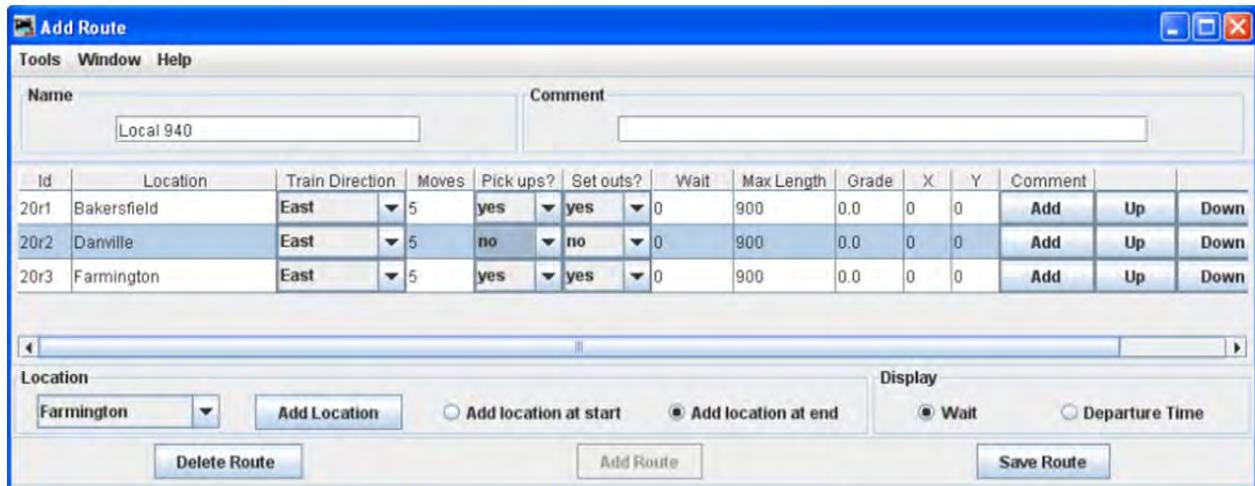
Press Add Location .Updated Add Route window will be displayed with all the attributes required active.



Now build your route by selecting the next location the train will visit, select all locations that the train will pass through even if the train will not work the location. This way your train's engineer will know when reading his manifest the towns he will be traveling through. Each time you add a location to the route, the table shows the order in which the train will visit. You can move a location up or down in the sequence if needed.

We will now add all the locations to the route. Now make sure that **Add location at end** is selected to add after the first location.

Make sure you press Save Route button when you are done with entering the locations.



Each **Location** has the train's departure direction(**Train Direction**), number of desired car **Moves**, and whether car **Pickups?** And or car **Drops?** are allowed at that location.

You can also adjust the maximum train length (**Max Length**) that can depart that location. A car move can be a car pickup or car drop at that location. For example, 5 moves can be 5 pickups or 5 drops or any combination of 5 pickups or drops.

The **Grade** is used to determine how many engines the train will require for that segment. The **X** and **Y** are the coordinates on your dispatcher's panel for the optional train icon. You can set the coordinates here, or use the "SetX&Y" train icon popup menu to teach the program where you want the train icon placed when the train is at the specified location. Leave the X and Y coordinates at zero if you want to manually move the icon or you're not

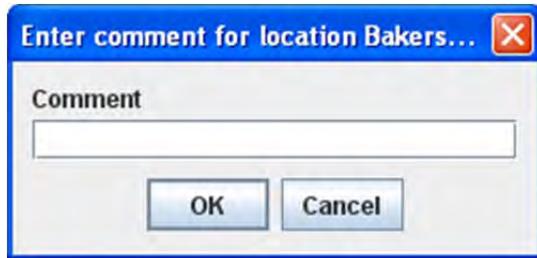
# JMRI® User's Guide Version 2.12

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using the icon feature. After setting the number of moves, maximum length, or coordinates, click on the table to make sure it is recognized by the program.

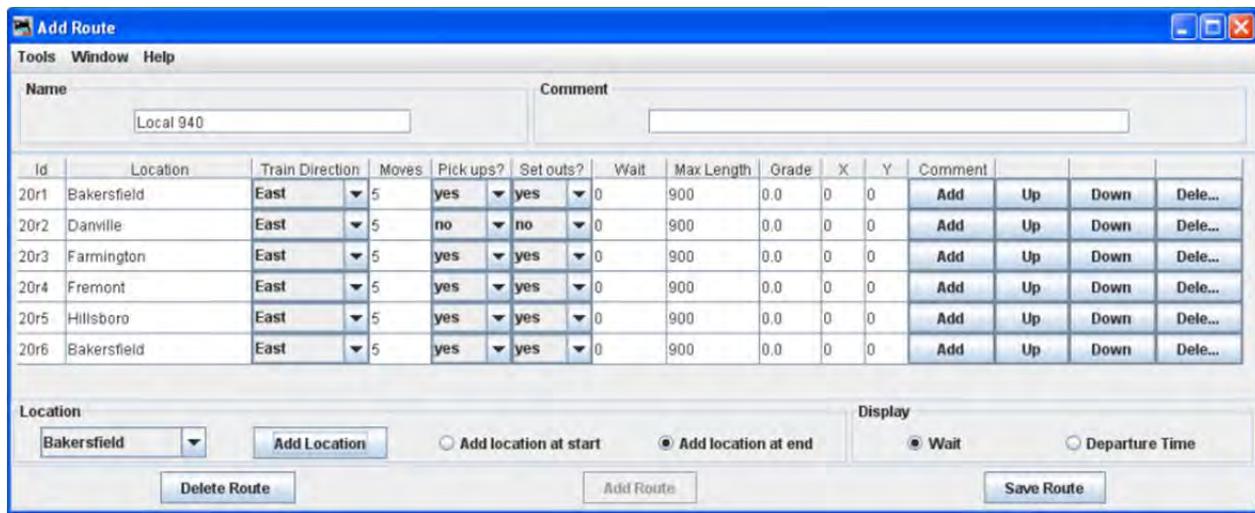
You may move the selected location Up button or Down button to change position in list.

You may add a comment for each location. press Comment Add button.



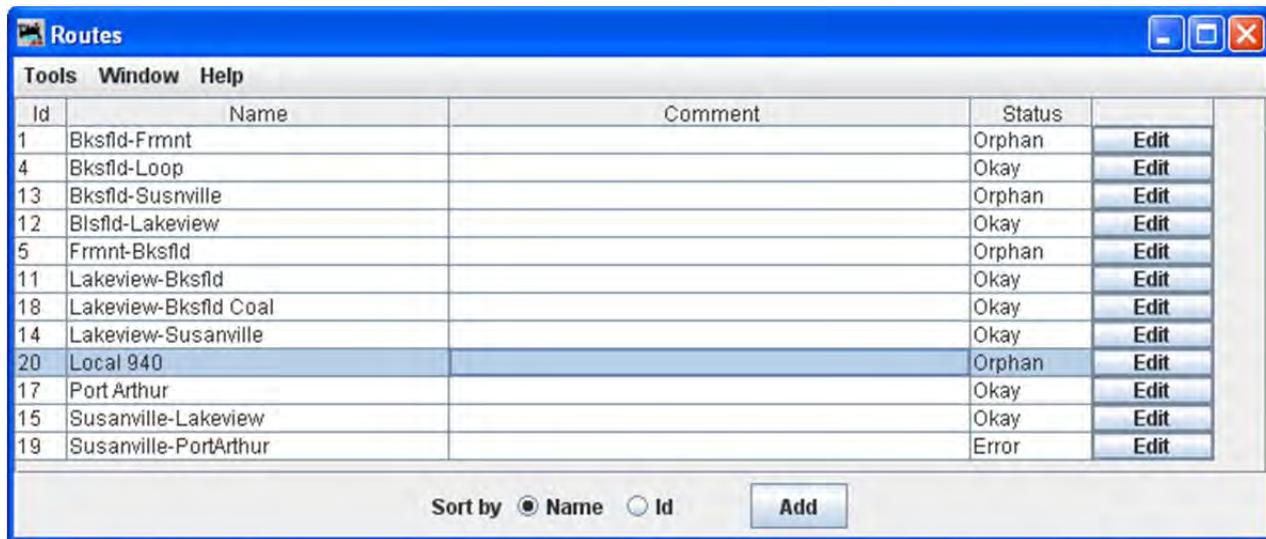
Press Save Route button which save your route. The program will create a file (OperationsRouteRoster.xml) in your JMRI directory in a folder called "operations". A backup file with the last settings for all of your routes is also created each time Save Route button is pressed.

Now we have our first route set up.



You may start a new route using the Add Route window and entering a new route name and repeat this process for each route.

Now back to the Route window, which will show us a list of all the routes.



Note that you may press Edit button on any route and the **Edit Route** window opens which is identical to the **Add Route** window except for title

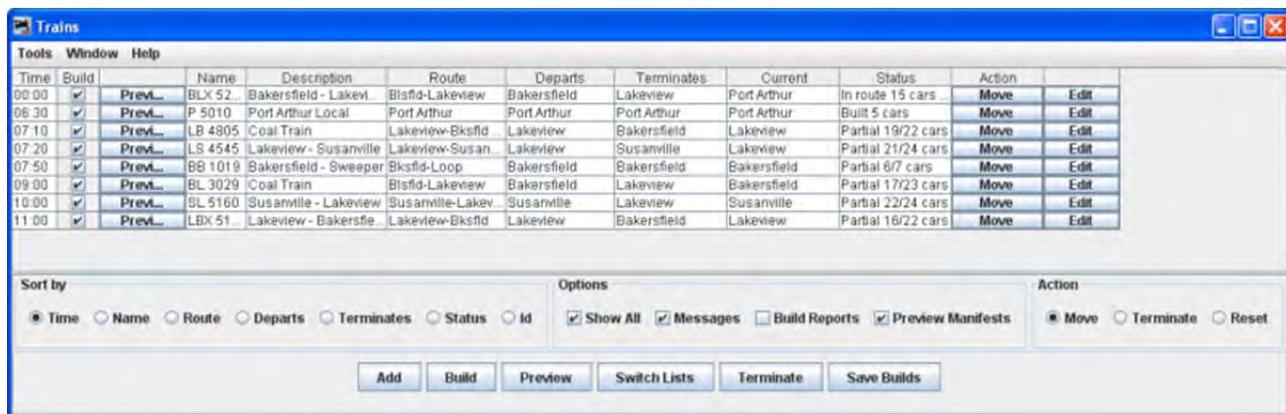
You may now press Add button to add another route, repeating the process just completed.

Now that we have routes setup we need to set up some [Trains](#).

## OPERATIONS TRAINS WINDOW

The **Trains** window opens which allows you to build trains to run on your layout. This window is selected from the JMRI main page from **Tools-->Operations-->Trains** menu or if enabled **Operations-->Trains** menu.

At the bottom of the window is a series of buttons, at this time press Add button to open the [Add Train](#) window.



## MENU BAR



## TOOLS

**PRINT** -- opens printer dialog for your default printer and prints the list of Trains

**PREVIEW** -- opens default printer preview window.

Trains		- 1 -		August 24, 2011 2:11 PM	
Name	Description	Route	Departs	Time	Terminates
BLX	Bakersfield	- L Blsfld-Lakeview	Bakersfield	00:00	Lakeview
P	Port Arthur Loc	Port Arthur	Port Arthur	06:30	Port Arthur
LB	Coal Train	Lakeview-Bksfld	Lakeview	07:10	Bakersfield
LS	Lakeview - Susa	Lakeview-Susanv	Lakeview	07:20	Susanville
BB	Bakersfield - S	Bksfld-Loop	Bakersfield	07:50	Bakersfield
BL	Coal Train	Blsfld-Lakeview	Bakersfield	09:00	Lakeview
SL	Susanville - La	Susanville-Lake	Susanville	10:00	Lakeview
LBX	Lakeview - Bake	Lakeview-Bksfld	Lakeview	11:00	Bakersfield

**PREVIEW** -- opens default printer preview window.

**Print Preview**

Previous Page Next Page Page 1 of 1 Close

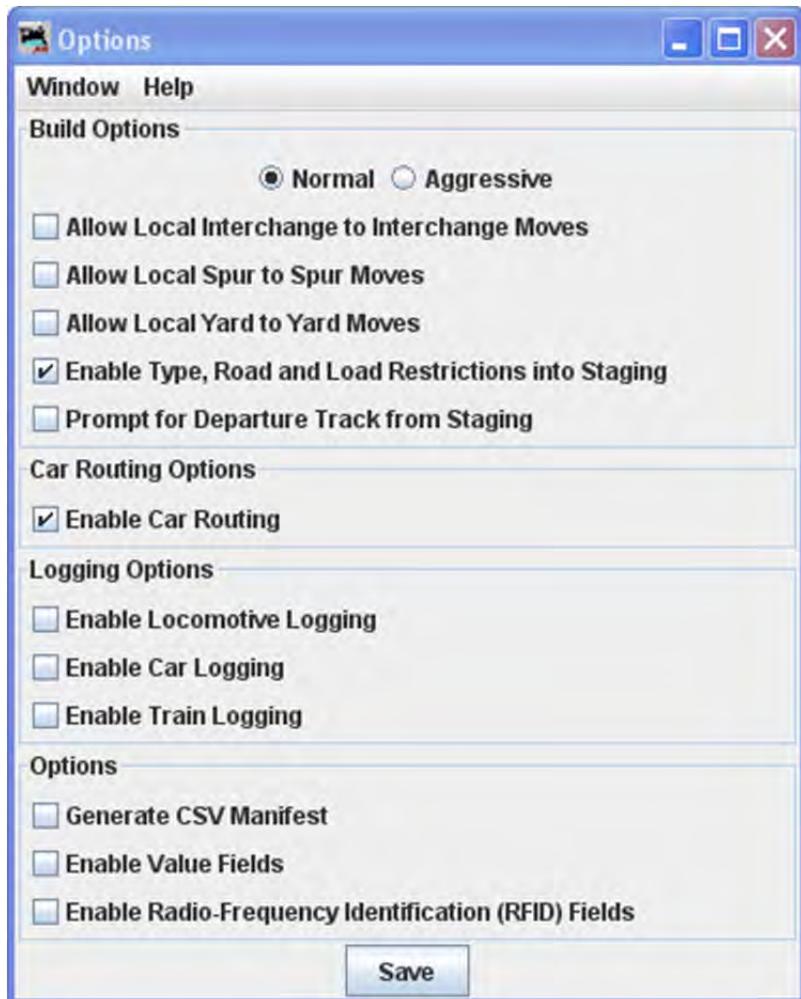
---

**Trains** - 1 - August 24, 2011 2:17 PM

Name	Description	Route	Departs	Time	Terminates
BLX	Bakersfield	- L Bksfld-Lakeview	Bakersfield	00:00	Lakeview
P	Port Arthur Loc	Port Arthur	Port Arthur	05:30	Port Arthur
LB	Coal Train	Lakeview-Bksfld	Lakeview	07:10	Bakersfield
LS	Lakeview	- Susa	Lakeview-Susanv	07:20	Susanville
BB	Bakersfield	- S Bksfld-Loop	Bakersfield	07:50	Bakersfield
BL	Coal Train	Bksfld-Lakeview	Bakersfield	09:00	Lakeview
SL	Susanville	- La	Susanville-Lake	10:00	Lakeview
LBX	Lakeview	- Bk	Lakeview-Bksfld	11:00	Bakersfield

S- Build Option Opens the Options window.

The **Options** window is opened from the **Trains** window **Tools** menu.



Standard JMRI® **Window** and **Help** menus

## Build Options

**Normal**  **Aggressive**

Normal builds are recommended when you first begin the program. Normal builds guarantee that when a car is delivered (set out) by a train that there will be track space available for the car.

Aggressive builds makes the car's track space available as soon as a car is scheduled for pick up.

Note that once you've built a train, the build option can not be changed until all trains are terminated or reset.

Next set of options control local car movements. Normally, it is better not to allow a car to move from one spur directly to another spur in the same location.

**Enable Type, Road and Load Restrictions into Staging**

When selected, the program will only deliver a train to a staging track that has the same rolling stock, road, and load name restrictions.

**Prompt for Departure Track from Staging**

If selected the program asks you which track should depart from staging during the train build. Note that the program will only prompt you if there are two or more trains available in staging that meet the train's requirements.

## Car Routing Options

**Enable Car Routing**

when enabled, the program will use multiple trains to deliver a car to its final destination. It is recommended that you leave this option enabled. When enabled, you can use [Schedule](#) to deliver a car to a specific location.

## Logging Options

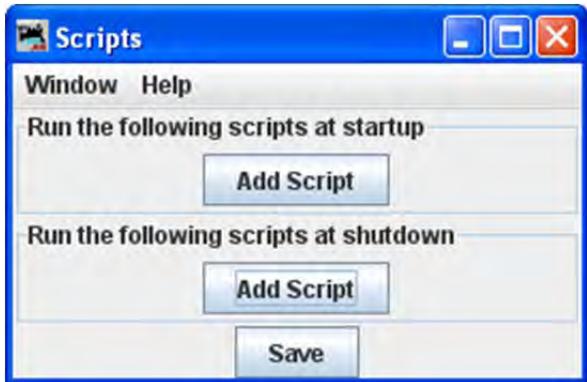
You can have the program log your locomotive, car, or train movement to a file by selecting the appropriate check boxes. The program creates a new directory "logger" in the operations directory. For each day's session the program will create a new file (.csv) using the day's date.

## Options

Allow you to create your own custom manifest using .csv file. Import into a program like Excel to create a manifest to your liking.

Save button saves the settings to disk to preserve them.

**SCRIPTS**- Opens the Scripts dialog.



Run the following scripts at startup

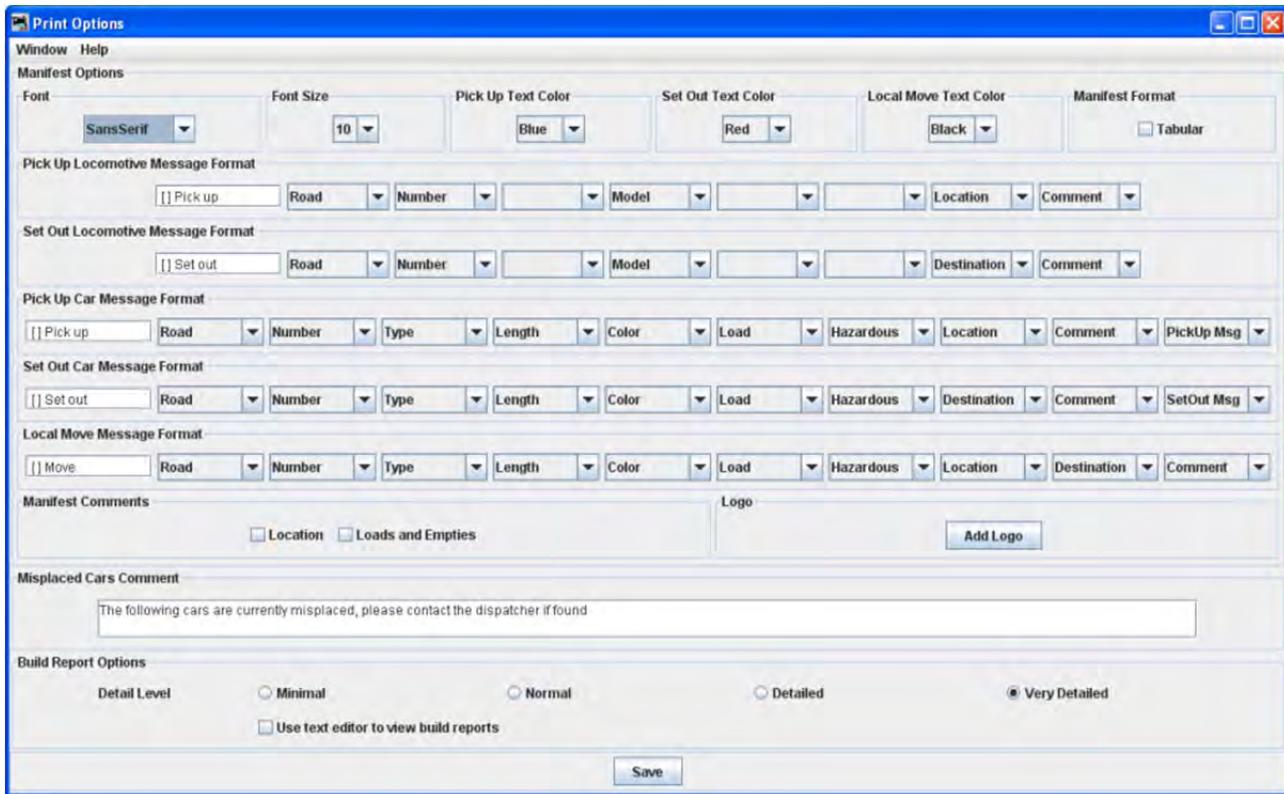
Add Script button

Run the following scripts at shutdown

Add Script button

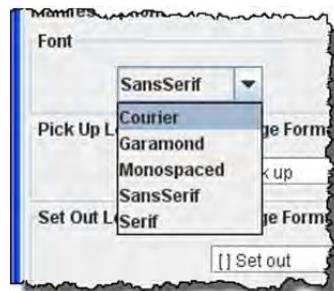
Press Save button to save your scripts.

## PRINT OPTIONS

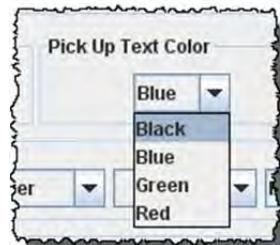
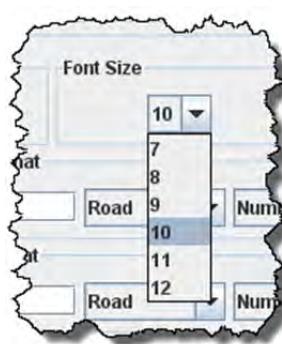


You can modify how the program prints the train manifests and the amount of detail that the build report provides.

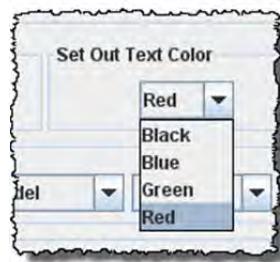
## MANIFEST OPTIONS



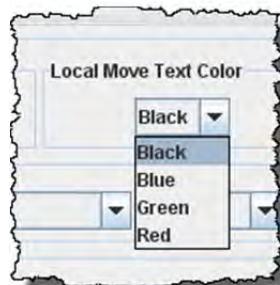
Select the desired **Font** and **Size**



Assign manifest print color for car or locomotive **Pick Up**



Assign manifest print color for car or locomotive **Set Out**



Assign manifest print color when the operation is to move a car from one track to another at same location



Select if you want manifest printed in tabular format. It works best with mono-spaced fonts, **Courier** or **Monospaced**

PICK UP LOCOMOTIVE MESSAGE FORMAT	You may customize the messages for your manifest and switch list printing. Select formats from dropdown menus. To remove an attribute select blank. The Prefixes in the text boxes may be edited. If you want to use the text color options, the set out, pick u and move prefixes must be unique.
SET OUT LOCOMOTIVE MESSAGE FORMAT	
PICK UP CAR MESSAGE FORMAT	
SET OUT CAR MESSAGE FORMAT	
LOCAL MOVER MESSAGE FORMAT	

## Manifest Comments

Each location can have an optional comment. You can print these comments on your manifest if the  **Location** is selected.

Select  **Loads and Empties** to show how many car loads and empties are in the train.

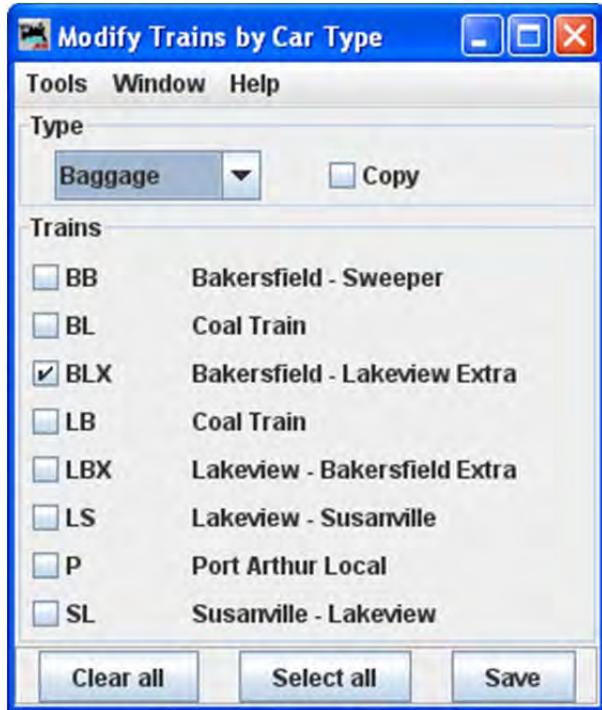
## Logo

allows you to add a logo in the top right hand corner of your manifests and switch lists, press and select a file with the image you want to display. Each train in your roster may have a different logo, this is set in [Trains Setup](#)

## Misplaced Cars Comment

**MODIFY TRAINS BY CAR TYPE**-- opens **Modify by Car Type** window to allow you to modify a train.

Opened from **Trains** window **Tools** menu Use this tool to quickly modify the type of cars your train will service. Very useful when adding a new car type to your roster.



## Menu Bar

- **Tools**
  - [Print Train by Car Types](#)
  - [Preview Train by Car Types](#)
- **Window** - standard JMRI® menu
- **Help**- standard JMRI® menu

## Type

**Copy**

Select car tpe you wish to use. The program will then show which Trains can service that car type. Check the Copy box to make a car behave like another. The car type will show to the right of the Copy checkbox.

to have both car types serviced by the same trains

## PRINT TRAIN BY CAR TYPES

*Trains by Car Types***- 1 -**

August 25, 2011 1:07 AM

Type	Trains	Description
Baggage		
	BLX	Bakersfield - Lakeview Extra
	BT	Basic Tour
Boxcar		
	BB	Bakersfield - Sweeper
	BLX	Bakersfield - Lakeview Extra
	BT	Basic Tour
	LBX	Lakeview - Bakersfield Extra
	LS	Lakeview - Susanville
	P	Port Arthur Local
	SL	Susanville - Lakeview
Caboose		
	BB	Bakersfield - Sweeper
	BL	Coal Train
	BLX	Bakersfield - Lakeview Extra
	BT	Basic Tour
	LB	Coal Train
	LBX	Lakeview - Bakersfield Extra
	LS	Lakeview - Susanville
	SL	Susanville - Lakeview
Coal		
	BL	Coal Train
	BT	Basic Tour
	P	Port Arthur Local
Coilcar		
	BB	Bakersfield - Sweeper
	BLX	Bakersfield - Lakeview Extra
	BT	Basic Tour
	LBX	Lakeview - Bakersfield Extra
	LS	Lakeview - Susanville
	P	Port Arthur Local
	SL	Susanville - Lakeview
Flat		
	BB	Bakersfield - Sweeper
	BLX	Bakersfield - Lakeview Extra
	BT	Basic Tour
	LBX	Lakeview - Bakersfield Extra
	LS	Lakeview - Susanville
	P	Port Arthur Local
	SL	Susanville - Lakeview
Flat Timber		
	BB	Bakersfield - Sweeper
	BLX	Bakersfield - Lakeview Extra
	BT	Basic Tour
	***	* . . . * . . . * . . . *

**PREVIEW TRAIN BY CAR TYPES**

**Print Preview**

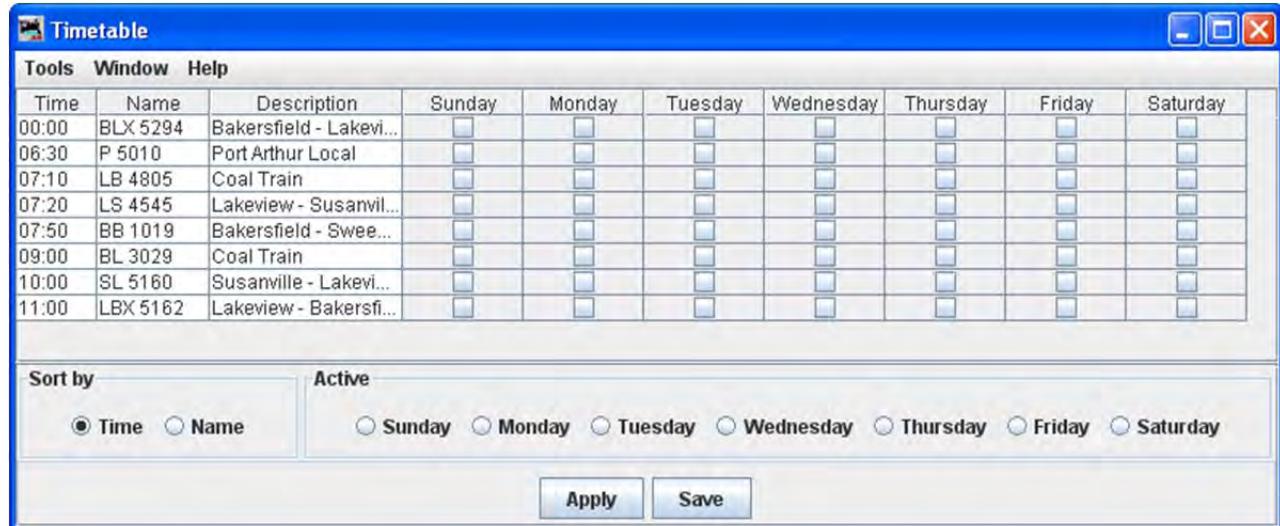
Previous Page **Next Page** Page 1 of 6 Close

*Trains by Car Types* - 1 - August 25, 2011 1:17 AM

Type	Trains	Description
<b>Baggage</b>		
BLX	Bakersfield	- Lakeview Extra
BT	Basic Tour	
<b>Boxcar</b>		
BB	Bakersfield	- Sweeper
BLX	Bakersfield	- Lakeview Extra
BT	Basic Tour	
LBX	Lakeview	- Bakersfield Extra
LS	Lakeview	- Susanville
P	Port Arthur	Local
SL	Susanville	- Lakeview
<b>Caboose</b>		
BB	Bakersfield	- Sweeper
BL	Coal Train	
BLX	Bakersfield	- Lakeview Extra
BT	Basic Tour	
LB	Coal Train	
LBX	Lakeview	- Bakersfield Extra
LS	Lakeview	- Susanville
SL	Susanville	- Lakeview
<b>Coal</b>		
BL	Coal Train	
BT	Basic Tour	
P	Port Arthur	Local
<b>Coilcar</b>		
BB	Bakersfield	- Sweeper
BLX	Bakersfield	- Lakeview Extra
BT	Basic Tour	
LBX	Lakeview	- Bakersfield Extra
LS	Lakeview	- Susanville
P	Port Arthur	Local
SL	Susanville	- Lakeview
<b>Flat</b>		
BB	Bakersfield	- Sweeper
BLX	Bakersfield	- Lakeview Extra
BT	Basic Tour	
LBX	Lakeview	- Bakersfield Extra
LS	Lakeview	- Susanville
P	Port Arthur	Local
SL	Susanville	- Lakeview
<b>Flat Timber</b>		
BB	Bakersfield	- Sweeper
BLX	Bakersfield	- Lakeview Extra
BT	Basic Tour	
LBX	Lakeview	- Bakersfield Extra
LS	Lakeview	- Susanville
P	Port Arthur	Local
SL	Susanville	- Lakeview
<b>FlatBH</b>	BB	Bakersfield - Sweeper

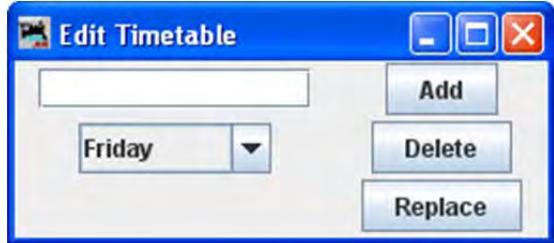
- **TIMETABLE** - opens the **Timetable** window.

Opened from the **Trains Window Tool** menu. The Timetable tool allows you to define which trains will run on any given day



## MENU BAR

- **Tools**
  - **Edit Timetable**



- **Window** - standard JMRI® menu
- **Help** - standard JMRI ®menu

- **WINDOWS** -- standard JMRI® format.
- **HELP** -- standard JMRI® format.

The main body displays the list of all the trains that have been built. Each train has a Preview, Move and Edit button associated with it.

07:10	<input checked="" type="checkbox"/>	<a href="#">Prev...</a>	LB 4805	Coal Train	Lakeview-Bksfld ...	Lakeview	Bakersfield	Lakeview	Partial 19/22 cars	<a href="#">Move</a>	<a href="#">Edit</a>
07:20	<input checked="" type="checkbox"/>	<a href="#">Prev...</a>	LS 4545	Lakeview - Susanville	Lakeview-Susan...	Lakeview	Susanville	Lakeview	Partial 21/24 cars	<a href="#">Move</a>	<a href="#">Edit</a>
07:50	<input checked="" type="checkbox"/>	<a href="#">Prev...</a>	BB 1019	Bakersfield - Sweeper	Bksfld-Loop	Bakersfield	Bakersfield	Bakersfield	Partial 6/7 cars	<a href="#">Move</a>	<a href="#">Edit</a>

Preview button opens the [Print Preview](#) window showing the trains Manifest.

Move button advances one location on the trains route each time pressed until it will be finally terminated.

Edit Button opens the [Edit Train](#) window which is basically the same as the [Add Train](#) window



**Sort by** (sets the sort sequence for the train list)

Time  Name (default)  Route  Departs  Terminates  Status  Id

**Options** (selects the options desired for the train list)

Show All  Messages  Build Reports  Preview Manifests

**Action**

Move  Terminate  Reset



Add button opens the [Add Train](#) window

Build button will build the train and the button changes to [Print Preview](#) button when completed, messages

Preview button may be displayed if build can not be completed.

Preview button shows the manifest in [Preview](#) window

Switch Lists button opens the [Switch Lists by Location](#) window

Terminate button terminates selected train.

Save Builds button saves the builds to disk

Train Manifest Print Preview

Print Preview

Previous Page Next Page Page 1 of 1 Close

Train Manifest Bakersfield - Lakeview Extra - 1 - August 24, 2011 3:14 PM

JMRI Operations Demo Railroad

Manifest for train (BLX) Bakersfield - Lakeview Extra  
Valid 8/20, 2011 04:28  
Does not service coal cars

[ ] Pick up SP 5294 RSD4 from Engine Terminal  
[ ] Pick up SP 5307 RSD4 from Engine Terminal

Scheduled work in Bakersfield, departure time 00:00

[ ] Pick up CNW 1555 Boxcar 40' Tuscan L<oad> from #68 Bkfstld Grain  
[ ] Pick up SP 490118 HopGrain 36' Gray E<empty> from #68 Bkfstld Grain  
[ ] Pick up MEC 6198 Boxcar 40' Green L<oad> from #68 Heritage Funn  
[ ] Pick up KOTX 8279 TankKero 38' Silver L<oad> from #80,81 Bkfstld Oil  
[ ] Pick up SSW 77167 HopCmmt 36' Gray E<empty> from SP SSW Interchange  
[ ] Pick up SP 163025 Boxcar 40' Silver E<empty> from SP SSW Interchange  
[ ] Pick up GATX 15418 TankVeg 33' Silver E<empty> from yard  
[ ] Pick up C&IM 16648 Boxcar 40' Green L<oad> from yard  
[ ] Pick up CNW 39610 Coilcar 53' Gray E<empty> from yard  
[ ] Pick up MKT 46132 Boxcar 50' Tuscan L<oad> from yard  
[ ] Pick up NKP 87194 Boxcar 50' Tuscan E<empty> from yard  
[ ] Pick up SOO 137764 Boxcar 40' Brown L<oad> from yard  
[ ] Pick up GTW 315079 HopGrain 36' Blue E<empty> from yard  
[ ] Pick up UP 499087 Boxcar 50' Yellow L<oad> from yard  
[ ] Pick up SP 1341 Caboose 40' Tuscan from Caboose Track

Train departs Bakersfield Eastbound with 15 cars, 794 feet, 1159 tons

No work at Port Arthur  
No work at Danville  
No work at Hillsboro  
No work at Farmington

Scheduled work in Lakeview, estimated arrival time 00:20

[ ] Set out CNW 1555 Boxcar 40' Tuscan L<oad> to #95 Yard Track  
[ ] Set out SP 490118 HopGrain 36' Gray E<empty> to #95 Yard Track  
[ ] Set out MEC 6198 Boxcar 40' Green L<oad> to #95 Yard Track  
[ ] Set out KOTX 8279 TankKero 38' Silver L<oad> to #95 Yard Track  
[ ] Set out SSW 77167 HopCmmt 36' Gray E<empty> to #95 Yard Track  
[ ] Set out SP 163025 Boxcar 40' Silver E<empty> to #95 Yard Track  
[ ] Set out GATX 15418 TankVeg 33' Silver E<empty> to #95 Yard Track  
[ ] Set out C&IM 16648 Boxcar 40' Green L<oad> to #95 Yard Track  
[ ] Set out CNW 39610 Coilcar 53' Gray E<empty> to #95 Yard Track  
[ ] Set out MKT 46132 Boxcar 50' Tuscan L<oad> to #95 Yard Track  
[ ] Set out NKP 87194 Boxcar 50' Tuscan E<empty> to #95 Yard Track  
[ ] Set out SOO 137764 Boxcar 40' Brown L<oad> to #95 Yard Track  
[ ] Set out GTW 315079 HopGrain 36' Blue E<empty> to #95 Yard Track  
[ ] Set out UP 499087 Boxcar 50' Yellow L<oad> to #95 Yard Track  
[ ] Set out SP 1341 Caboose 40' Tuscan to #95 Yard Track  
[ ] Set out SP 5294 RSD4 to #95 Yard Track  
[ ] Set out SP 5307 RSD4 to #95 Yard Track

Train terminates in Lakeview

DP 2.12 Manual - da... Mozilla Firefox Adobe Dreamweave... Microsoft Excel - JM... Deco

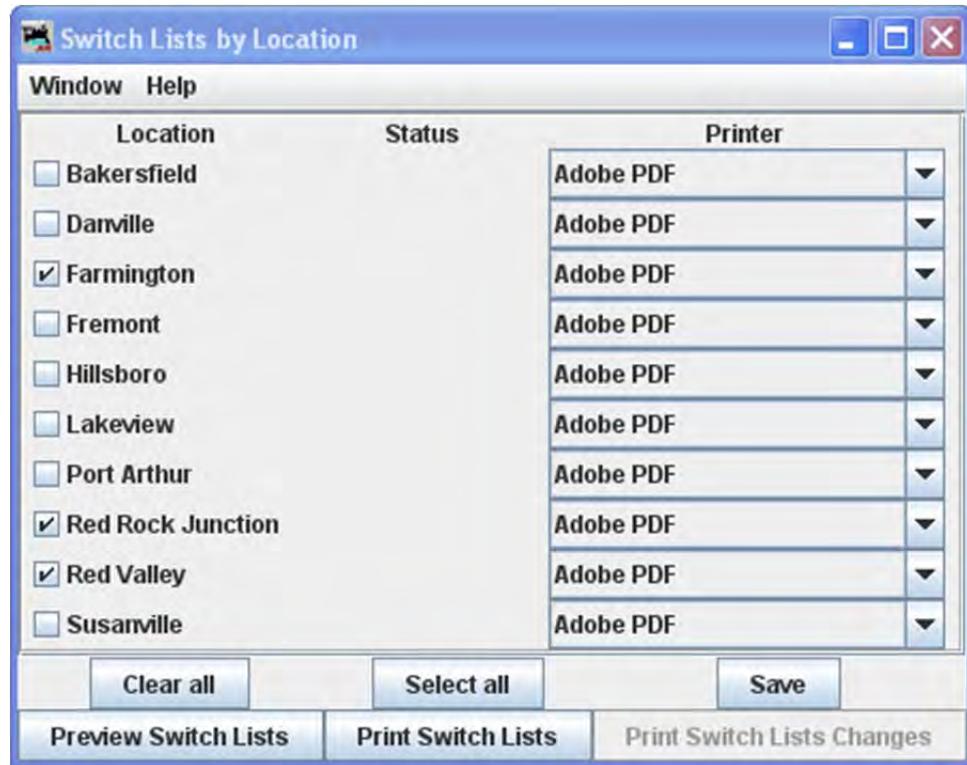
## JMRI® User's Guide Version 2.12

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A switch list shows the work required to service all of the trains visiting that location. Normally a switch list is given to the person in charge of a yard or a location with many spurs or industries.

To Preview or Print Switch Lists, select the location(s) and set printer, then press Preview Switch Lists button or Print Switch Lists button

Save button will store your selections.



Preview or Printed Switch List

Switch List Bakersfield

---

JMRI Operations Demo Railroad

Switch List for Bakersfield

Valid 8/24, 2011 16:23

Scheduled work for train (LS) Lakeview - Susanville

Departs Lakeview at 07:20 expected arrival 08:04, arrives Westbound

[ ] Pick up ATSF 10407 Boxcar 50' Tuscan L<oad> from yard

[ ] Set out MRL 9089 HopGrain 36' Gray L<wheat> to #68 Bkrsfld Grain

[ ] Set out SOO 177514 Boxcar 50' White L<oad> to #68 Pabsb&Son Cold Strge

[ ] Set out G&F 442 Boxcar 50' Green L<oad> to #68 Pabsb&Son Cold Strge

[ ] Set out GARE 812 Reefer Milk 38' Green E<empty> to yard

[ ] Set out N&W 42120 Boxcar 40' Black L<oad> to yard

Scheduled work for train (BB) Bakersfield - Sweeper

Departs Bakersfield Eastbound at 07:50

[ ] Pick up SP 1019 SW1200 from Engine Terminal

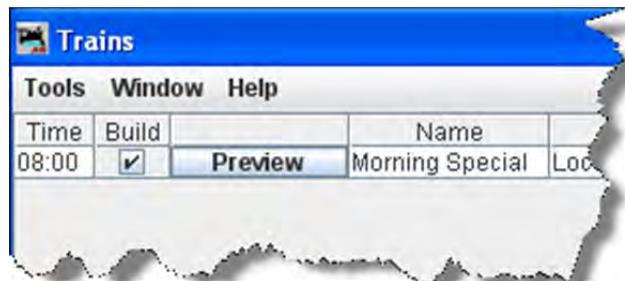
[ ] Pick up NH 681 Caboose 34' Black from Caboose Track

## BUILDING TRAINS

To build one train, press Build button in the row for the desired train in the **Trains** window. After the train is built Build button changes to Print button or Preview button.



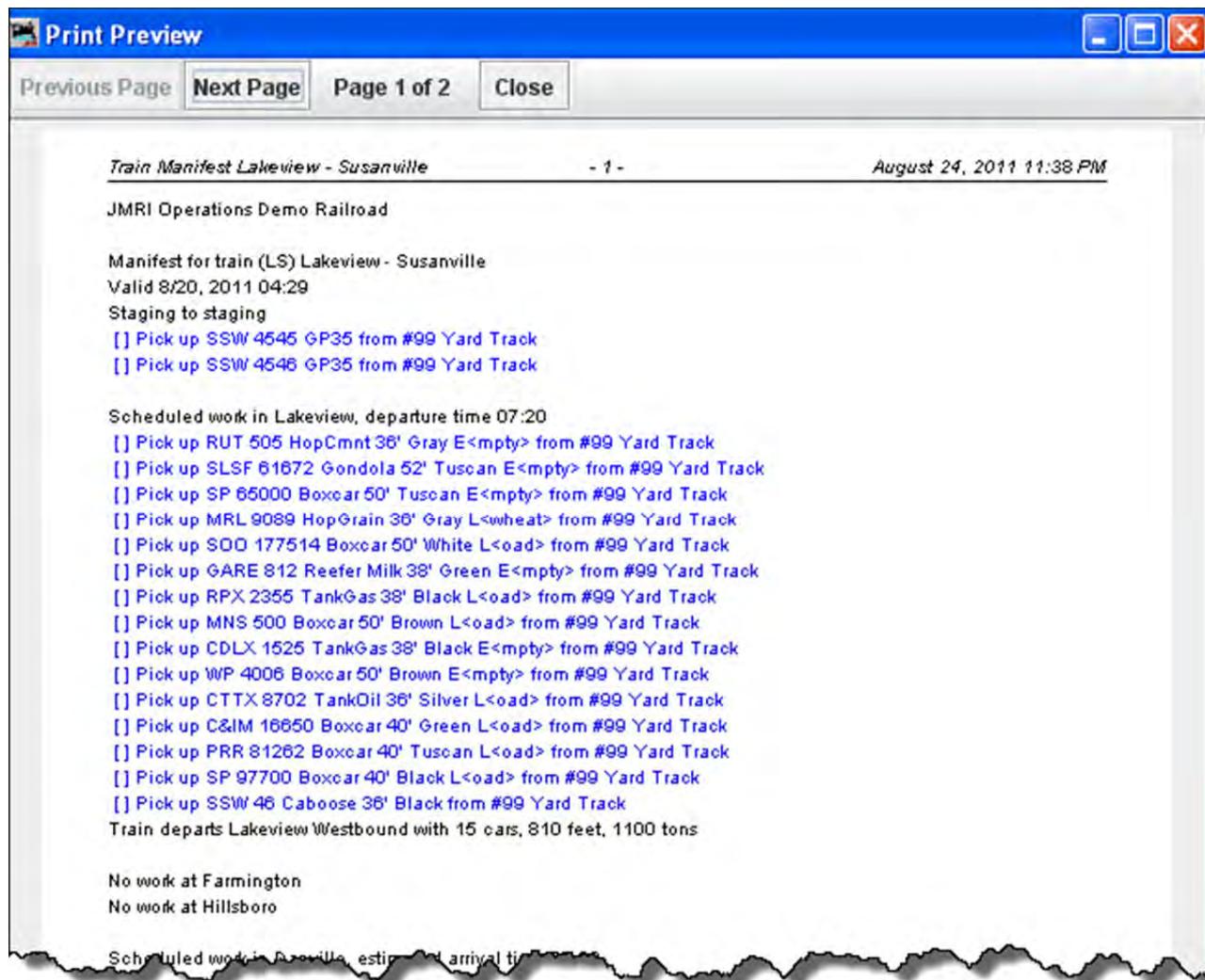
If you want to review how the train was built, select the  **Build Reports** before pressing Preview button for the desired train. If the  **Preview Manifest** is selected, the program will generate the build report and manifest and present them in preview windows.



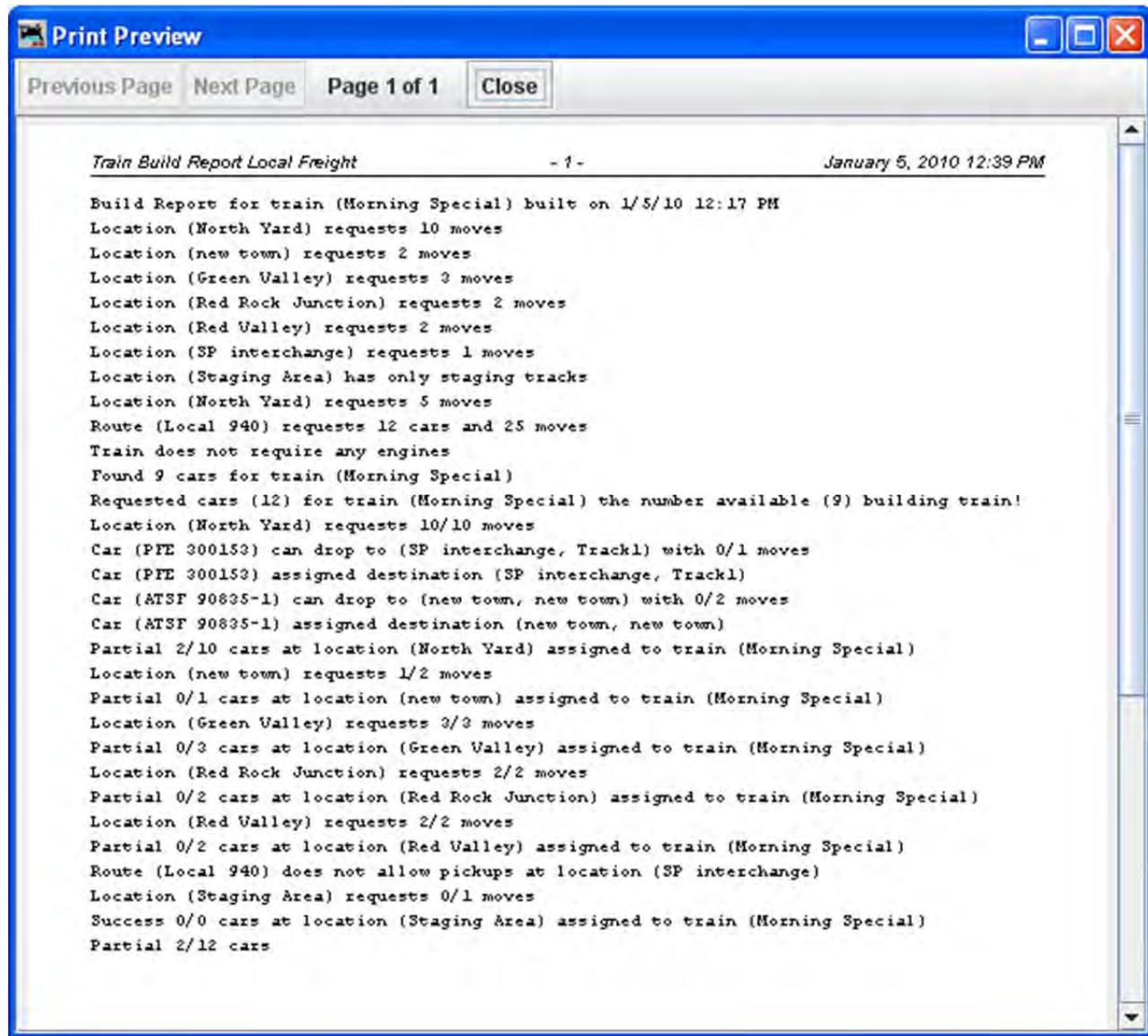
If you want to build several trains without having to press individual buttons for each train, select the trains that you want built in the **Build** column  and press Build button found at the bottom of the trains panel. The program will then build manifests for all of the selected trains.

If a train fails to build, the Move button will change its text to Report button . Pressing Report button will print or preview the build report for this train. Whenever a train fails to build, a build failure message will appear. If you want to disable this feature deselect the checkbox  **Build Messages**.

With  **Preview Manifest** press Preview button and the Train Manifest is displayed using your system printer's preview window.



With  **Preview Manifest**,  **Build Reports** and  **Build Messages** selected, press Preview button and all the Reports and Train Manifest are previewed, then you may print the desired reports or manifest using your system print dialog.



## PROBLEMS BUILDING TRAINS

If you have a problem building a train you can select the  **Build Reports** checkbox at the bottom of the train panel. When a build fails for any reason and the  **Build Reports** checkbox is selected, the program will send a report to your printer if the  **Preview Manifests** isn't selected; or to a preview window if the  **Preview Manifests** is selected. The build report can print out different levels of detail, from minimal to very detailed. See the Settings section [Build Report Details](#) for more information on how to change the build report detail level.

## BUILDING MULTIPLE TRAINS FOR A SESSION

Most operating sessions require more than one train to keep your operators busy. The correct way to do this is to build and print all of the trains needed before terminating them. So if you need a dozen trains for a session, you must build twelve trains before you terminate any one train. Terminating a train tells the program that the engines and cars in that particular train have been delivered to their final locations and can be used again when building new trains. So always build all, print all, then terminate each train after completing its run! It is okay to build all trains, print all train, and then use the Save Builds button and shut down the program. Later you can restart the program and terminate the trains that completed their runs.

The correct time to terminate a train is when the train actually arrives at its destination. Terminating a train before it completes its run means that the operation database believes that the engines and cars have been delivered. It is better to build and print twelve trains and then later find out that only nine trains completed their runs. You would then terminate nine trains, and leave the other three for next time. Or if you wish you could reset any trains that didn't depart from their terminal. Resetting trains really isn't necessary, the trains that didn't run during this session could run during the next session.

An alternate method is to build, print, and use the for each train to track the actual movement of the trains during your session. As long as the trains on your layout match the locations in the program you can build a new train.

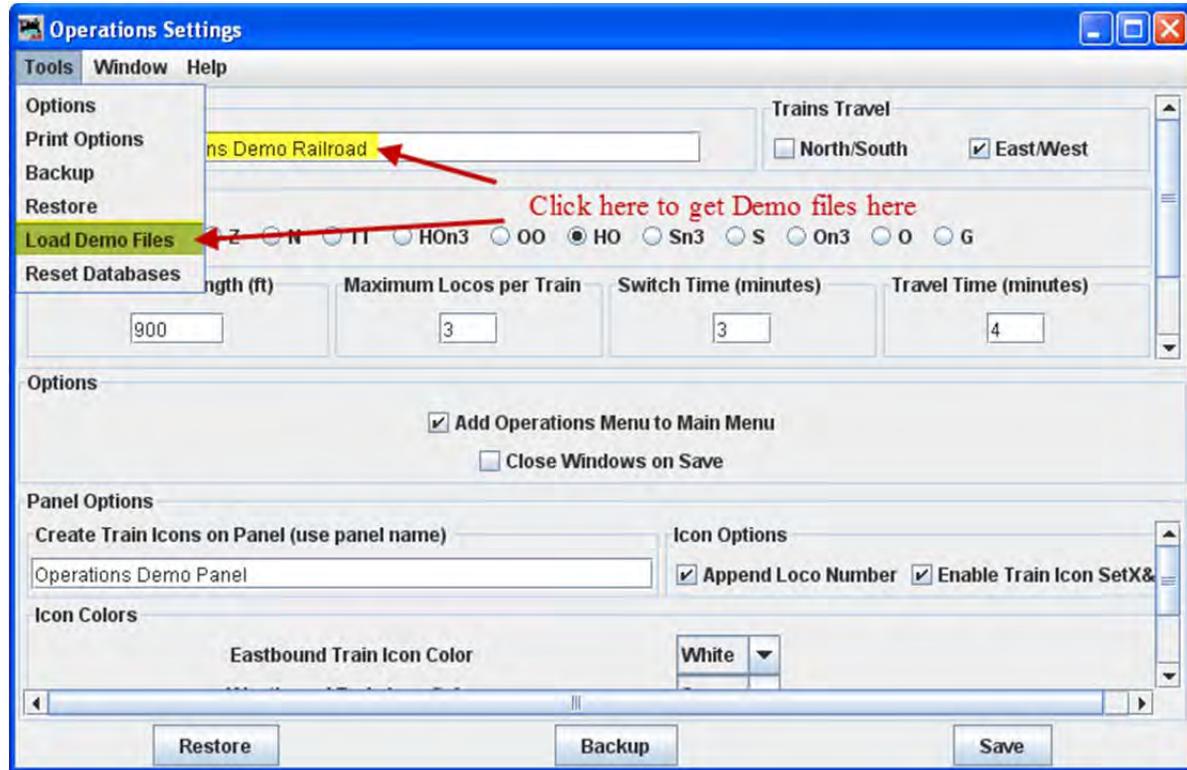
## MOVING TRAINS

After providing your operators with a printed manifest or location switch list, you must keep the program database synchronized with the actual movement of trains on your layout. This is done by the Move button located on the far right of the train menu. Pressing the move button will cause the train to depart its current location move to the next location in the route. The engines and cars assigned to the train will travel to the next location on the railroad. At each location, cars can be picked up or dropped off. You can also move a train by selecting the train's icon and selecting Move button from the icon's popup menu. Each press of the Move button moves the train closer to its terminal location. When the train arrives at the last location in the route, the last press of the Move button will terminate the train. Once a train is terminated, you can build it again.

Each time an engine or car is moved a count associated with them is incremented. The program uses this to determine which cars haven't moved recently and tries to select cars with the least number of moves when building new trains. Each time a location has a car picked up or dropped, the program increments a count associated with that location. The program tries to move cars to locations that have experienced the least number of car operations.

## A TRIP THROUGH OPERATIONS

Well, now that we've had an overview of Operations, let's see if we can make it work. We could sit down and enter a whole bunch of information into the Locations, Cars, Engines, Routes and Trains screens or do it the easy way and use the built-in Demo Railroad. Since this is a training (pun intended) exercise, we'll use the Demo files. To get the demo files entered, Go to the JMRI main menu and click on Tools, scroll all the way to the bottom to select Operations( or Operations menu is set in Operations settings), and slide sideways to select Settings. On the Operations Settings screen select the Tools menu and then select Load Demo Files.

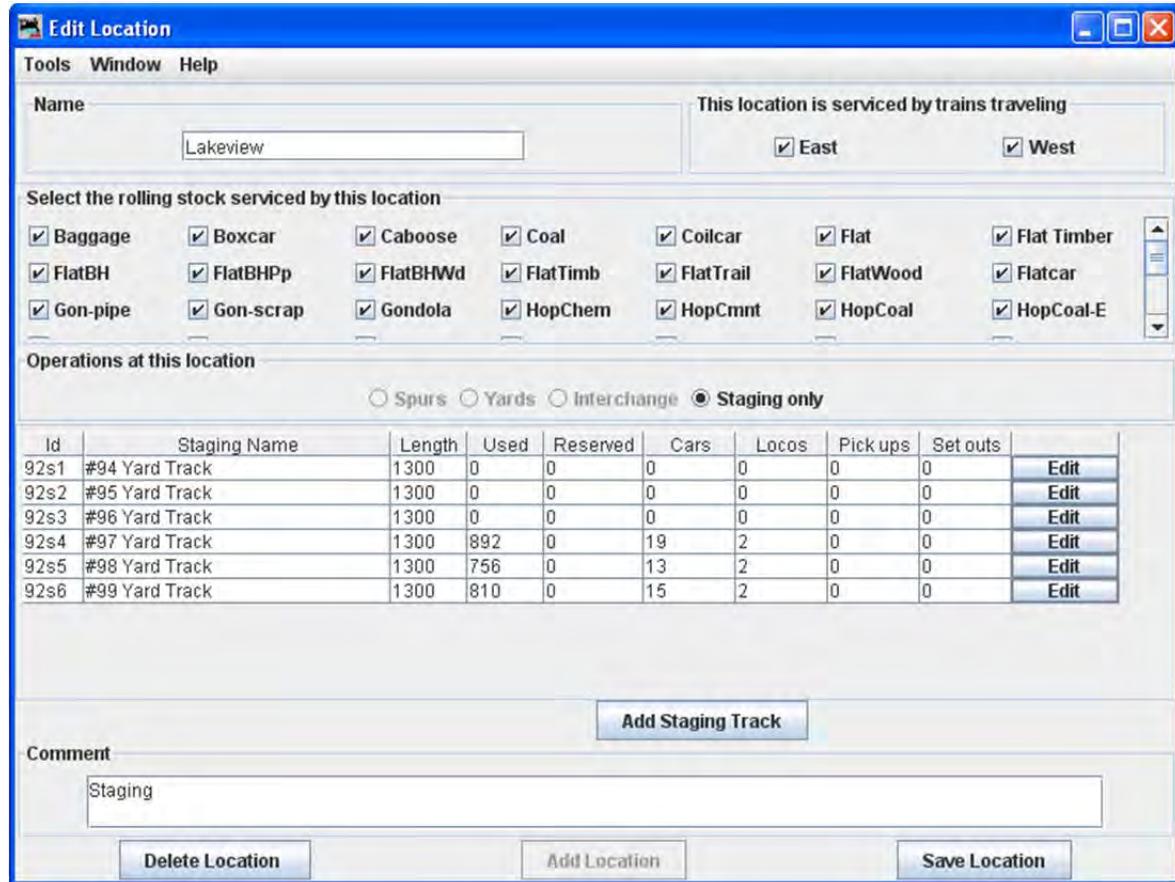


Now go back to the DecoderPro main menu to quit and then re-start the program. This will load the Demo files. When the program presents the main JMRI screen, click on Tools menu, scroll all the way to the bottom to select Operations, and it expands to the Operations menu. Select Locations which opens and displays the Location window as shown below. All of the locations are shown as a list sorted by Name.

Locations							
Id	Name	Length	Used	Rolling Stock	Pickups	Drops	
78	Bakersfield	6573	2927	63	0	5	Edit
80	Danville	2540	1166	24	0	0	Edit
6	Farmington	1981	1528	35	0	0	Edit
89	Fremont	715	569	12	0	0	Edit
83	Hillsboro	2157	943	21	2	15	Edit
92	Lakeview	5200	543	10	0	0	Edit
84	Port Arthur	1697	425	9	0	0	Edit
91	Susanville	3200	1118	24	0	0	Edit

Sort by  Name  Id      Add

If you select Lakeview and click on the Edit box way over on the right of the entry for Lakeview, you'll see a screen like that below, Edit Location, showing that Lakeview is a staging area that can accommodate almost any kind of car. This will be the starting point for our mythical trip.



We will now exit **Edit Location** window that describes location Lakeview Staging Area, by clicking the window close icon (red X) in the upper right corner of the window. Also close the **Locations** window in the same manner.

Now, let's take a look at what resources are available to make up our train. Open the Cars window from the Operations menu. The Cars window now lists all the cars that are in the Operations Program database and can be chosen to make up a train, so many that there's a scrollbar on the right to scroll through the list. Again clicking on the Edit box on the right we could see the specifics of any one car and of course Edit the data (if it was our own). We won't bother.

# JMRI® User's Guide Version 2.12

**Cars**

Number	Road	Type	Len	Color	Kernel	Location	Destination	Train	Moves	Set	Edit
12	VN	Boxcar	40	Yellow		Bakersfield (yard)			23	<a href="#">Set</a>	<a href="#">Edit</a>
40	SSW	Caboose...	36	Tuscan		Susanville (#84 Yard Track)			25	<a href="#">Set</a>	<a href="#">Edit</a>
45	SSW	Caboose...	36	Tuscan		Lakeview (#97 Yard Track)			28	<a href="#">Set</a>	<a href="#">Edit</a>
46	SSW	Caboose...	36	Black		Lakeview (#99 Yard Track)			8	<a href="#">Set</a>	<a href="#">Edit</a>
101	WDLX	HopCoal-E	31	Orange	Coal Em...	Danville (yard)			29	<a href="#">Set</a>	<a href="#">Edit</a>
102	WDLX	HopCoal-E	31	Orange	Coal Em...	Danville (yard)			29	<a href="#">Set</a>	<a href="#">Edit</a>
104	WDLX	HopCoal-E	31	Orange	Coal Em...	Danville (yard)			29	<a href="#">Set</a>	<a href="#">Edit</a>
105	WDLX	HopCoal-E	31	Orange	Coal Em...	Danville (yard)			29	<a href="#">Set</a>	<a href="#">Edit</a>
208	VTR	Boxcar	40	Green		Susanville (#82 Yard Track)			3	<a href="#">Set</a>	<a href="#">Edit</a>
259	SP	Caboose...	36	Tuscan		Lakeview (#98 Yard Track)			29	<a href="#">Set</a>	<a href="#">Edit</a>
352	SKX	TankOil	40	Black		Susanville (#84 Yard Track)			15	<a href="#">Set</a>	<a href="#">Edit</a>
401	BM	Caboose...	34	Blue		Bakersfield (Caboosie Track)			27	<a href="#">Set</a>	<a href="#">Edit</a>
442	G&F	Boxcar	50	Green		Port Arthur (#153 Zane Mercantile)			15	<a href="#">Set</a>	<a href="#">Edit</a>
452	C&EI	Boxcar	40	Tuscan		Bakersfield (yard)			25	<a href="#">Set</a>	<a href="#">Edit</a>
500	MNS	Boxcar	50	Brown		Lakeview (#99 Yard Track)			16	<a href="#">Set</a>	<a href="#">Edit</a>
505	RUT	HopCmnt	36	Gray		Lakeview (#99 Yard Track)			16	<a href="#">Set</a>	<a href="#">Edit</a>
508	RUT	HopCmnt	36	Gray		Hillsboro (yard)			24	<a href="#">Set</a>	<a href="#">Edit</a>
606	TP&W	Boxcar	40	Green		Susanville (#83 Yard Track)			22	<a href="#">Set</a>	<a href="#">Edit</a>
607	TP&W	Boxcar	40	Green		Susanville (#83 Yard Track)			15	<a href="#">Set</a>	<a href="#">Edit</a>
681	NH	Caboose...	34	Black		Bakersfield (Caboosie Track)			25	<a href="#">Set</a>	<a href="#">Edit</a>
752	SP	Caboose...	36	Brown		Susanville (#83 Yard Track)			26	<a href="#">Set</a>	<a href="#">Edit</a>
812	GARE	Reefer Milk	38	Green		Lakeview (#99 Yard Track)			12	<a href="#">Set</a>	<a href="#">Edit</a>
948	PFE	ReeferIce	40	Green		Lakeview (#98 Yard Track)			23	<a href="#">Set</a>	<a href="#">Edit</a>
1087	BCK	Boxcar	40	Tuscan		Lakeview (#98 Yard Track)			19	<a href="#">Set</a>	<a href="#">Edit</a>

Sort by  Number  Road  Type  Color  Load  Kernel  Location  Destination  FD  RWE  Train  Moves  Built  Owner

210 cars [Add](#) [Save](#) [Find](#)

Of course, we'll need Motive Power to pull our train, so let's look at what's in the Locomotive stable.

**Locomotives**

Number	Road	Model	Type	Len	Consist	Location	Destination	Train	Moves	Set	Edit
1017	SP	SW1200	Diesel	45		Bakersfield (Engine Terminal)			18	<a href="#">Set</a>	<a href="#">Edit</a>
1019	SP	SW1200	Diesel	45		Bakersfield (Engine Terminal)			18	<a href="#">Set</a>	<a href="#">Edit</a>
1633	C&O	Allegheny	Steam	125		Bakersfield (Engine Terminal)			0	<a href="#">Set</a>	<a href="#">Edit</a>
1641	C&O	Allegheny	Steam	125		Bakersfield (Engine Terminal)			0	<a href="#">Set</a>	<a href="#">Edit</a>
3023	SP	TRAINMA...	Diesel	66	nce_106	Bakersfield (Engine Terminal)			38	<a href="#">Set</a>	<a href="#">Edit</a>
3029	SP	TRAINMA...	Diesel	66	nce_106*	Bakersfield (Engine Terminal)			38	<a href="#">Set</a>	<a href="#">Edit</a>
4501	SSW	GP35	Diesel	56	SSW 1*	Susanville (#84 Yard Track)			7	<a href="#">Set</a>	<a href="#">Edit</a>
4503	SSW	GP35	Diesel	56	SSW 1	Susanville (#84 Yard Track)			7	<a href="#">Set</a>	<a href="#">Edit</a>
4545	SSW	GP35	Diesel	56	SSW 2*	Lakeview (#99 Yard Track)			11	<a href="#">Set</a>	<a href="#">Edit</a>
4546	SSW	GP35	Diesel	56	SSW 2	Lakeview (#99 Yard Track)			11	<a href="#">Set</a>	<a href="#">Edit</a>
4802	SP	TRAINMA...	Diesel	66	nce_118	Lakeview (#97 Yard Track)			49	<a href="#">Set</a>	<a href="#">Edit</a>
4805	SP	TRAINMA...	Diesel	66	nce_118*	Lakeview (#97 Yard Track)			49	<a href="#">Set</a>	<a href="#">Edit</a>
5010	SP	GP30	Diesel	56		Port Arthur (#165 Service)			23	<a href="#">Set</a>	<a href="#">Edit</a>
5151	SP	RS18	Diesel	52	nce_127	Susanville (#83 Yard Track)			17	<a href="#">Set</a>	<a href="#">Edit</a>
5160	SP	RS18	Diesel	52	nce_127*	Susanville (#83 Yard Track)			17	<a href="#">Set</a>	<a href="#">Edit</a>
5162	SP	RS18	Diesel	52	RS18s*	Lakeview (#98 Yard Track)			20	<a href="#">Set</a>	<a href="#">Edit</a>
5166	SP	RS18	Diesel	52	RS18s	Lakeview (#98 Yard Track)			20	<a href="#">Set</a>	<a href="#">Edit</a>
5294	SP	RSD4	Diesel	52	nce_115*	Bakersfield (Engine Terminal)			29	<a href="#">Set</a>	<a href="#">Edit</a>
5307	SP	RSD4	Diesel	52	nce_115	Bakersfield (Engine Terminal)			29	<a href="#">Set</a>	<a href="#">Edit</a>

Sort by  Number  Road  Model  Consist  Location  Destination  Train  Moves  Built  Owner

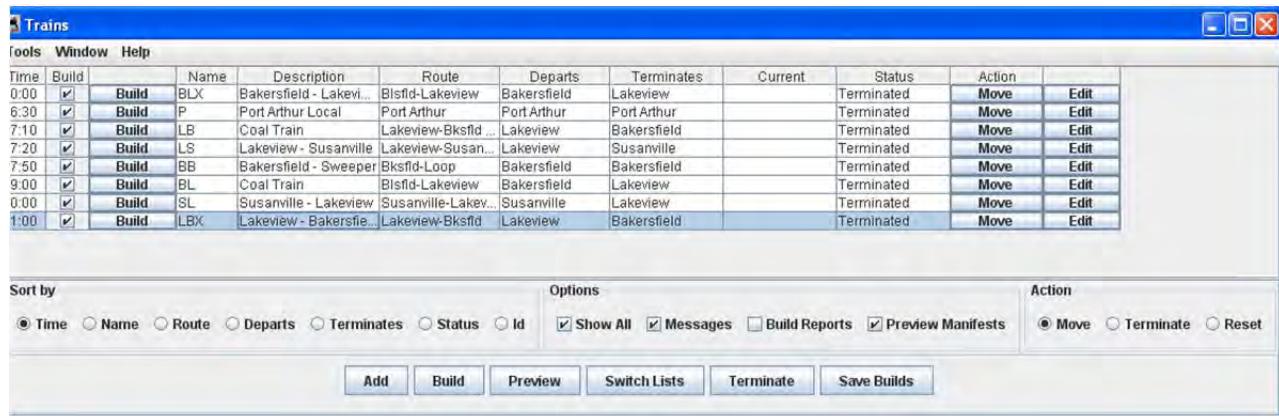
19 locomotives [Add](#) [Save](#) [Find](#)

Since we know we're departing from **Lakeview** we probably want to eyeball that pair of **Trainmasters** sitting over on track **#97**. The Command Station on our Demo railroad is obviously an NCE product because these locos are assigned **NCE consist #118**.

## JMRI® User's Guide Version 2.12

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So how does Operations REALLY work?? Well, once you have all the data entered as we've seen above, we can generate a set of manifests for the train operations. To do this we use the Trains window. Select **Trains** from the **Operations** menu and the **Trains** window will display.



Here there are several trains ready to build. The highlighted train is **LBX from Lakeview to Bakersfield**. By putting a check mark in the box under build and then clicking the Build Box at the bottom of the screen we were able to get the manifest built so that we can preview it. It's a short run, but still takes more than one page of fine print instructions for the crew.

# JMRI® User's Guide Version 2.12

Print Preview

Previous Page **Next Page** Page 1 of 2 Close

Train Manifest Lakeview - Bakersfield Extra - 1 - August 30, 2011 3:34 PM

JMRI Operations Demo Railroad

Manifest for train (LBX) Lakeview - Bakersfield Extra  
Valid 8/30, 2011 15:32  
Does not service coal cars

[ ] Pick up SSW 4545 GP35 from #99 Yard Track  
[ ] Pick up SSW 4546 GP35 from #99 Yard Track

Scheduled work in Lakeview, departure time 11:00

[ ] Pick up SLSF 61672 Gondola 52' Tuscan E<empty> from #99 Yard Track  
[ ] Pick up GARE 812 Reefer Milk 38' Green E<empty> from #99 Yard Track  
[ ] Pick up C&IM 10650 Boxcar 40' Green L<load> from #99 Yard Track  
[ ] Pick up RUT 505 HopCmnt 38' Gray E<empty> from #99 Yard Track  
[ ] Pick up CTTX 8702 TankOil 38' Silver L<load> from #99 Yard Track  
[ ] Pick up RPX 2355 TankGas 38' Black L<load> from #99 Yard Track  
[ ] Pick up MRL 9089 HopGrain 38' Gray L<wheat> from #99 Yard Track  
[ ] Pick up MNS 500 Boxcar 50' Brown L<load> from #99 Yard Track  
[ ] Pick up PRR 81262 Boxcar 40' Tuscan L<load> from #99 Yard Track  
[ ] Pick up SP 97700 Boxcar 40' Black L<load> from #99 Yard Track  
[ ] Pick up CDLX 1525 TankGas 38' Black E<empty> from #99 Yard Track  
[ ] Pick up SP 65000 Boxcar 50' Tuscan E<empty> from #99 Yard Track  
[ ] Pick up WP 4006 Boxcar 50' Brown E<empty> from #99 Yard Track  
[ ] Pick up SOO 177514 Boxcar 50' White L<load> from #99 Yard Track  
[ ] Pick up SSW 46 Caboose 38' Black from #99 Yard Track

Train departs Lakeview Westbound with 15 cars, 810 feet, 1100 tons

Scheduled work in Farmington, estimated arrival time 11:04

[ ] Pick up BAR 2084 Boxcar 40' RED/WHT E<empty> from WH #89 Schramm Mfg  
[ ] Set out SLSF 61672 Gondola 52' Tuscan E<empty> to #189 Standard Steel

Train departs Farmington Westbound with 15 cars, 798 feet, 1095 tons

Scheduled work in Hillsboro, estimated arrival time 11:14

[ ] Pick up GATX 15437 TankVeg 38' Silver E<empty> from yard  
[ ] Set out GARE 812 Reefer Milk 38' Green E<empty> to Reefer Service  
[ ] Set out BAR 2084 Boxcar 40' RED/WHT E<empty> to Temple Stuart

Train departs Hillsboro Westbound with 14 cars, 752 feet, 1069 tons

Scheduled work in Danville, estimated arrival time 11:27

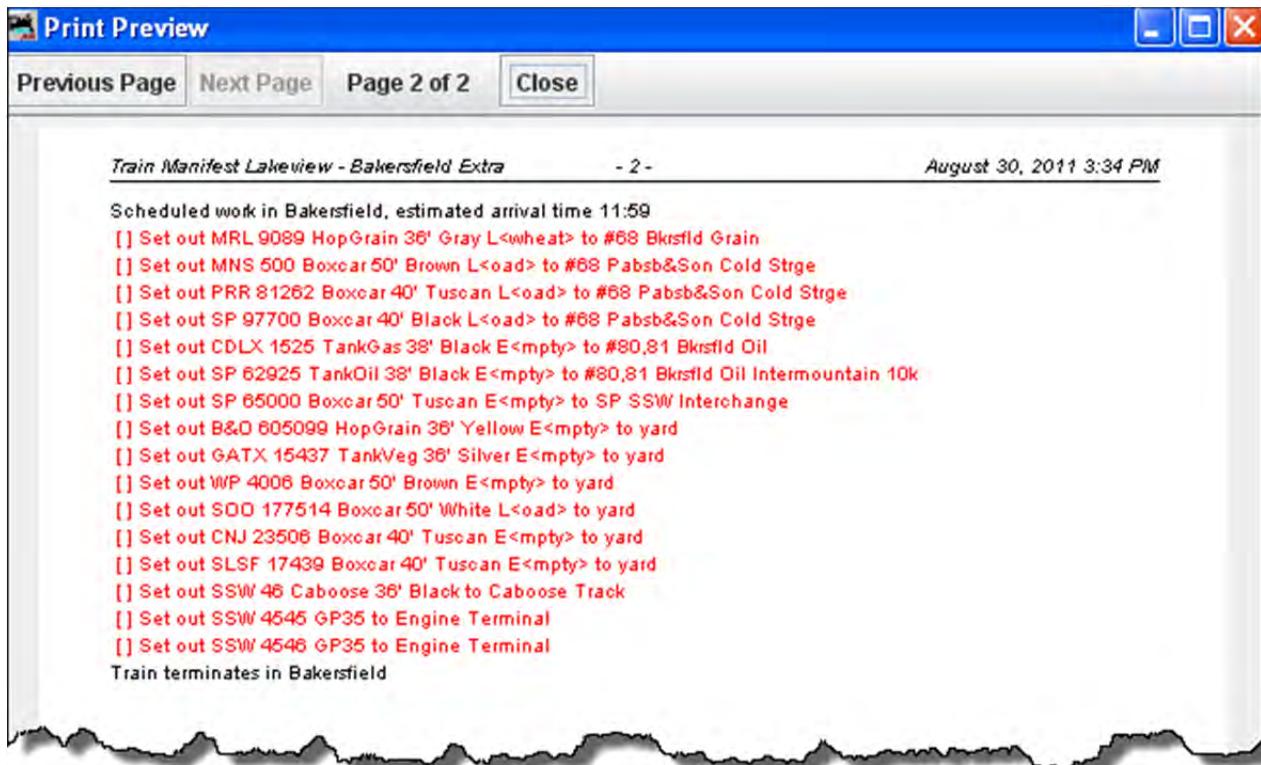
[ ] Pick up B&O 605098 HopGrain 38' Yellow E<empty> from yard  
[ ] Set out C&IM 10650 Boxcar 40' Green L<load> to #133 Herald Star  
[ ] Set out RUT 505 HopCmnt 38' Gray E<empty> to yard

Train departs Danville Westbound with 13 cars, 708 feet, 993 tons

Scheduled work in Port Arthur, estimated arrival time 11:40

[ ] Pick up SP 62925 TankOil 38' Black E<empty> from #163 Siding Intermountain 10k  
[ ] Pick up CNJ 23506 Boxcar 40' Tuscan E<empty> from #159 Baron Gould Co  
[ ] Pick up SLSF 17439 Boxcar 40' Tuscan E<empty> from #45 Port Freight  
[ ] Set out CTTX 8702 TankOil 38' Silver L<load> to #157 Mackellar Coal&Oil  
[ ] Set out RPX 2355 TankGas 38' Black L<load> to #163 Siding

Train departs Port Arthur Westbound with 14 cars, 756 feet, 929 tons



We pick up our locomotives in Lakeview and head over to the yard to gather up a bunch of cars and a caboose. Then we get ready to depart at 7:10 on the fast clock. We should arrive at Farmington at 7:14, and since there were no Farmington bound cars in Lakeview, and nothing in Farmington bound for Hillsboro or Bakersfield, the program has scheduled no work to do at Farmington. So we'll keep going. When we arrive at Hillsboro (hopefully at 7:18), we have some set-outs and pick-ups to attend to. Then, we're off to Bakersfield, gliding through Danville and Port Arthur on the way. Arriving at Bakersfield right on time at 8:21, we drop the boxcar at Heritage Furniture, the Coal hopper in the yard, and slide the caboose gently into the caboose track. Now we can take the motive power over to the locomotive terminal and call in to Dispatch asking for the trip to be terminated. The trip is terminated by selecting it in the Trains screen and clicking the terminate button. This would then enter the new locations of the rolling stock into the data screens and release them for the next build. So that wasn't so difficult, was it? Hope you enjoyed your cab ride.

## CHAPTER 10 – DECODER DEFINITION

### GETTING STARTED

In this part of the manual we will introduce you to the process of creating a file to describe a new decoder. You might benefit from reading the other sections of the DecoderPro user guide to get background information, especially the **XML introduction** (<http://jmri.org/help/en/html/apps/DecoderPro/IntroXML.shtml>) and the section on what the configuration files contain **Configuration files** (<http://jmri.org/help/en/html/apps/DecoderPro/Files.shtml>) .

The easiest way to create a configuration file is to modify an existing one, so that you can follow the format. The decoder definition is configured per the **decoder-config.dtd**. (<http://jmri.sourceforge.net/xml/DTD/>) (most of you will not be interested in this dtd, if you are open in a text editor).

To get started, locate a decoder definition XML file that is close to the new decoder that you would like to define. If you don't know what is "close", well don't sweat it. Let's just move on to looking at a definition file and you'll get a feel about what we're talking about.

### FORMAT

#### FORMATTING THE DECODER DEFINITION

The easiest way to create a new decoder definition is to edit one that already exists that has parameters similar to your new decoder. Hundreds of decoder definitions are available in JMRI, so you should be able to find one that is similar as a starting point. Don't feel bad about standing on someone else's shoulders, that's the spirit of JMRI and open source software in general. Although you can call this new file anything you like, it will work best if you use the same convention as the provided files. That is "**manufacturer name**"\_"**decoder family**".xml, for example: **Digitrax\_1x2.xml** and **Atlas\_DualMode.xml**.

Now that you have located a Decoder Definition file as a starting point open the file with an XML editor (editors recommended by jmri are discussed on a [separate page](#)) (<http://jmri.sourceforge.net/help/en/html/doc/Technical/XmlDtdUsage.shtml>) or your favorite text editor. **DO NOT** try an advanced word processor like Word. Use a basic text file editor like Notepad, or an XML editor, XML Marker is a good one and it's free.

The beginning XML lines deal with the Header:

### AUTHOR

```
<decoder-config>
  <version author="jake@physics.berkeley.edu"
    version="10" lastUpdated="20050112"/>
  <version author="Walter Thompson wsthompson@earthlink.net"
    version="11" lastUpdated="20080412"/>
```

### DECODER FAMILY AND MODEL

```
<decoder>
  <family name="Premium FX with BEMF" mfg="Digitrax"
    lowVersionID="240" highVersionID="250">
    <model model="DH142" numOuts="4" numFns="2">
      <output name="4" label="Violet"/> </model>
    <model model="DN141" numOuts="4" numFns="2">
      <output name="4" label="Violet"/> </model>
    <model model="DN142" numOuts="4" numFns="2">
      <output name="4" label="Violet"/> </model>
    <model model="DN141K2" numOuts="4" numFns="2">
      <output name="4" label="Violet"/> </model>
    <model model="DN141E2" numOuts="4" numFns="2">
      <output name="4" label="Violet"/> </model>
    <model model="DN149K2" numOuts="4" numFns="2">
      <output name="4" label="Violet"/> </model>
  </family>
```

PROGRAMMING MODES THE DECODER WILL ACCEPT:

```
<programming direct="byteOnly" paged="yes"
  register="yes" ops="yes"></programming>
```

The next part of the file consists of a set of 'variable' elements defining specific variables, nested inside a 'variables' (note the extra "s") element. Here's where the real definition is determined.

Each variable represents one thing to configure. They can represent a single CV, e.g. address, or a few bits that can be configured to control a particular function. If some of these aren't appropriate to your decoder, you can just remove them. Make sure you remove the entire element from the <variable> to the matching </variable>. You can also rearrange them if you'd prefer a different sequence.

```
<variables>
  <variable label="Primary Address" CV="1" comment="Short address"
    item="Short Address" default="03">
    <shortAddressVal/></variable>
```

```
<variable label="Forward light FOF effect generated" CV="49" mask="XXXXVVVV"  
    item="Function FOF effect generated">  
    <enumVal>  
        <enumChoice choice="Normal function of lead"/>  
        <enumChoice choice="Random flicker"/>  
        <enumChoice choice="Mars light"/>  
        <enumChoice choice="Flashing head light"/>  
        <enumChoice choice="Single pulse strobe"/>  
        <enumChoice choice="Double pulse strobe"/>  
        <enumChoice choice="Rotary beacon simulation"/>  
        <enumChoice choice="Gyralite"/>  
        <enumChoice choice="Rule 17 dimmable headlight"/>  
        <enumChoice choice="FRED end of train light"/>  
        <enumChoice choice="Right ditch light; when F2 on, flashes alternately"/>  
        <enumChoice choice="Left ditch light; when F2 on, flashes alternately"/>  
        <enumChoice choice="Reserved (0x0C)"/>  
        <enumChoice choice="Reserved (0x0D)"/>  
        <enumChoice choice="Reserved (0x0E)"/>  
        <enumChoice choice="Reserved (0x0F)"/>  
    </enumVal>  
</variable>
```

Once you get your variables all in order, it's time to test the definition.

## TESTING

### TESTING THE DECODER DEFINITION

At this point, you've created a new configuration file! You can check it for syntax by selecting the [Check XML File](#) item from the [Debug menu](#). The **Open** dialog is displayed; select your file and click Open Button . If all is well, a dialog box will display that says "OK". If not, you'll get a completely incomprehensible error message. About the only useful part of that message is the line number. Re-open the editor to that line and try to see what's wrong with the syntax.

Once you have a decoder definition file that checks out for syntax, you need to try it in DecoderPro. Your new file should copied into the jmri decoders folder (windows C:\Program Files\JMRI\xml\decoders).

- Now start up DecoderPro, and open the [Debug menu](#). Select the **Recreate Decoder Index** option.
- The computer will run for a minute or two with the selection highlighted. As soon as that goes away, the new decoder index should be created and your new definition should be available to use.

When you are happy with your definition, you'll probably want to share it with the JMRI world, so next we'll look at submitting the definition to JMRI for inclusion in the next release.

## SUBMITTING TO JMRI

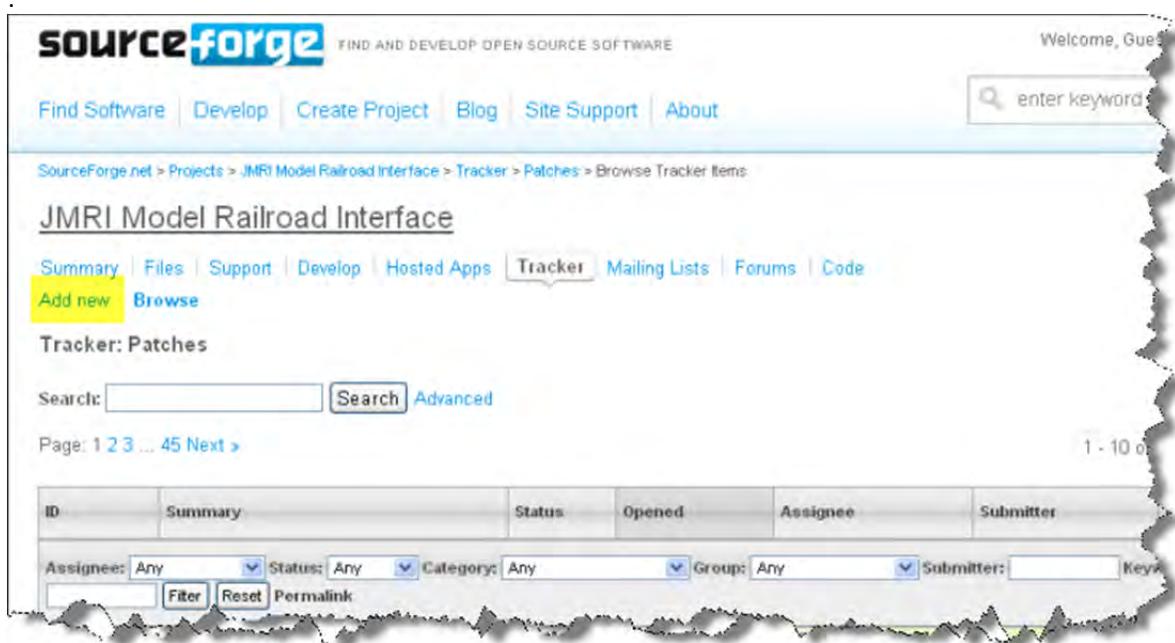
## SUBMITTING TO JMRI

### How do I go about getting these approved and into the next release?

If you're happy with them, you can contribute them to the next release by creating a "Patch" for the project.

#### To do this:

1. If you have a SourceForge account (they're free!), log on.  
If not, don't worry about it. Go to the [patch web site](http://sourceforge.net/tracker/?group_id=26788&atid=388315) ([http://sourceforge.net/tracker/?group\\_id=26788&atid=388315](http://sourceforge.net/tracker/?group_id=26788&atid=388315)) on SourceForge:
2. Click on **Add new** on left side of the screen as shown



# JMRI® User's Guide Version 2.12

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3. On the new page that comes up, enter something in the following fields:

JMRI Model Railroad Interface

Summary | Files | Support | Develop | Hosted Apps | **Tracker** | Mailing Lists | Forums | Code  
Add new | Browse  
Tracker: Patches

Add Artifact

Project: JMRI Model Railroad Interface Category: None Private:  Group: None

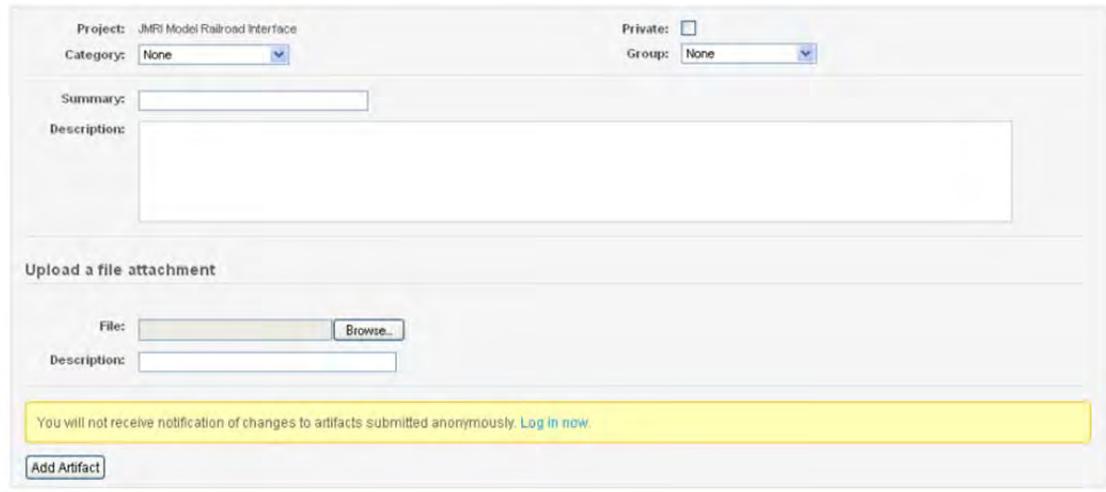
Summary:   
Description:

Upload a file attachment

File:  Browse...  
Description:

You will not receive notification of changes to artifacts submitted anonymously. [Log in now.](#)

**Add Artifact**



- a. Select the **Category**: XML files from
- b. **Summary**: type in a short summary of file
- c. **Description**: (Just a little more info) If you don't have a SourceForge account, make sure to put your name and email address in the Detailed Description field so we know who to thank!
- d. Upload a file attachment **File**:  locate the file on your computer and select it.
- e. Now form is completed, click on Add Artifact button and Your file is submitted for inclusion in a release.



## CHAPTER 11 - DECODERPRO® ERROR MESSAGES

### DECODER PROGRAMMER COMMON ERROR MESSAGES

Various things can go wrong when JMRI tries to work with your DCC command station to program a DCC decoder. This page lists the error message that can result, and describes what they mean.

#### JMRI ERROR CODES

##### **301 — no locomotive detected**

The command station has reported that it doesn't see a locomotive on the programming track.

This can happen if the locomotive isn't making good electrical contact or if there's a wiring fault in the locomotive.

##### **302 — programmer busy**

The command station has reported that it's busy doing something else, and can't do any programming right now. This usually means that some other part of the DCC system is doing a programming operation, e.g. a hand-held throttle.

Some DCC systems can't do ops-mode programming (programming on the main) while also using the service mode programming track, in which case they'll return this error message.

##### **303 — requested not implemented in command station**

This means that JMRI has requested the command station do something that it doesn't support.

This is not supposed to happen, as JMRI should disable programming modes that the command station can't provide. If you do see this message, please report the circumstances on the jmriusers mailing list.

##### **304 — aborted by user**

The user has requested that the read or write operation stop early.

This is considered an error, because the program doesn't know whether the decoder actually saw the operation complete or not.

##### **305 — confirm failed**

Some command stations allow you to "confirm" the content of a CV, rather than read the value from it. In general, this is faster than doing a complete read. If the value in the CV doesn't match the expected value, this message is issued. It's considered an error because if the values don't match, we know that we don't know the correct value for the CV contents.

##### **306 — timeout talking to command station**

The program did not hear back from the command station when it expected to.

This is by far the most common error message when people first start using JMRI. In that case, it usually means that the connection to the command station isn't correct. This could be a problem with the cable(s) making the connection, or a problem with how the preferences are set. Picking the wrong serial port is particularly common.

Once JMRI is working properly, this error may occasionally happen due to a transient error. DecoderPro generally will retry it successfully in that case.

## 307 — Unknown error

An error has happened, but JMRI doesn't know enough about it to be able to report more detail.

In general, JMRI is pretty good at deciphering what went wrong, and this message isn't very common. If you do see this message, please report the circumstances on the jmriusers mailing list.

## 308 — No acknowledge from locomotive

At the end of a CV read or write operation, the locomotive replies ("acknowledges") to the command station using a pulse of current.

If that pulse isn't seen, some command stations provide this error message. It could be due to poor electrical connections to the programming track or within the locomotive. It could also be that the decoder doesn't support readback.

Some decoders, particularly certain sound decoders, draw so much current that the reply pulse isn't detected by the command station. In that case, one of the various "programming boosters" may solve the problem.

## 309 — Short Circuit on Programming Track

The command station has reported seeing a short circuit on the programming track. That prevents programming operations.

Check the electrical connections to the programming track, and also within the locomotive.

## INDEX

---

### A

Acceleration Rate \_\_\_\_\_ 46  
**Add Location** 175, 179, 180, 183, 184, 187, 188, 194, 195, 218  
Add Spur Track \_\_\_\_\_ 186, 189, 190, 193  
**Address** v, 33, 59, 92, 93, 96, 100, 122, 124, 141, 146  
Advanced Consist Address \_\_\_\_\_ 61  
Advanced Features \_\_\_\_\_ iv, 61, 80  
Advanced Programmer \_\_\_\_\_ i, iv, 73, 74, 100  
Analog Clock \_\_\_\_\_ 85, 103  
Analog Controls \_\_\_\_\_ iv, 58, 79  
Atlas \_\_\_\_\_ 3, 245

---

### B

Back EMF \_\_\_\_\_ 46  
**Basic Speed Control** \_\_\_\_\_ 45, 46, 47, 49  
Booster Programming \_\_\_\_\_ 138  
British Railways \_\_\_\_\_ x, 165  
Build Option \_\_\_\_\_ 223

---

### C

Car Routing \_\_\_\_\_ 167, 224  
Cars vii, x, 85, 106, 117, 171, 179, 183, 196, 198, 200, 202, 210, 227, 238, 241  
Check Decoder Names \_\_\_\_\_ ix, 86, 155  
Check Programmer Names \_\_\_\_\_ ix, 86, 155  
Check XML File \_\_\_\_\_ ix, 86, 155, 247  
**Clock Monitor** \_\_\_\_\_ viii, 124, 137, 140  
Clocks \_\_\_\_\_ vi, 85, 102, 103  
Command Monitor vii, viii, ix, 118, 121, 134, 142, 147, 149, 153  
Communications Monitor \_ vii, viii, 118, 119, 121, 122, 123, 134, 141, 142, 146, 147, 148, 149, 150, 153  
Comprehensive \_\_\_\_\_ i  
Comprehensive Programmer \_ iii, 40, 41, 43, 67, 68, 73, 79, 80, 155  
Configure BDL16/BDL168 \_\_\_\_\_ vii, 125  
Configure Command Station \_\_\_\_\_ vii, 128  
Configure DS64 \_\_\_\_\_ vii, 127  
Configure PM4/PM42 \_\_\_\_\_ vii, 126  
Connections \_\_\_\_\_ ii, 5, 6, 7  
Consisting Functions \_\_\_\_\_ iv, 59, 80  
Consisting Tool \_\_\_\_\_ v, 85, 102

---

Console \_\_\_\_\_ ii, viii, ix, 14, 87, 94, 147, 148, 160  
Console Pane \_\_\_\_\_ ii, 14  
Constant Ratio Curve \_\_\_\_\_ 53  
Control Panel \_\_\_\_\_ v, vi, 93, 98, 99, 114  
**Copy Entry** \_\_\_\_\_ vi, 85, 107  
Create Entry \_\_\_\_\_ vi, 85, 107  
CSV file \_\_\_\_\_ 69  
Curve Shifted Left \_\_\_\_\_ 54  
Curve Shifted Right \_\_\_\_\_ 54  
CVs \_\_\_\_\_ 3, 30, 34, 37, 39, 44, 47, 48, 61, 63, 66, 69

---

### D

DCC \_\_\_\_\_ 3  
DCC Packet Analyzer \_\_\_\_\_ viii, 137  
Debug \_\_\_\_\_ v, ix, 86, 108, 154, 247  
Deceleration Rate \_\_\_\_\_ 46  
decoder \_ i, iii, xi, 3, 4, 15, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 51, 54, 55, 56, 57, 58, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69, 74, 82, 87, 94, 99, 100, 107, 123, 124, 130, 131, 132, 133, 137, 154, 155, 245, 246, 247, 251, 252  
decoder definition \_\_\_\_\_ 63, 155  
Decoder Family and Model \_\_\_\_\_ xi, 246  
**Defaults** \_\_\_\_\_ ii, 6, 8  
**Delete Entry** \_\_\_\_\_ vi, 86, 108  
Delete roster group \_\_\_\_\_ 110  
Dispatcher \_\_\_\_\_ vi, 85, 106  
**Display** \_\_\_\_\_ ii, viii, ix, 6, 13, 14, 87, 93, 99, 144, 156  
**Ditch light hold-over time** \_\_\_\_\_ 58

---

### E

Edit Consist \_\_\_\_\_ viii, 136, 139  
Edit Entry \_\_\_\_\_ vi, 85, 107  
Engines \_\_\_\_\_ 106, 113, 239  
Error \_\_\_\_\_ xi, xii, 65, 251  
Export \_\_\_\_\_ vi, 37, 69, 85, 86, 93, 108, 113, 198, 209

---

### F

**File Locations** \_\_\_\_\_ 6, 10  
File locations Pane \_\_\_\_\_ ii, 9  
Firmware \_\_\_\_\_ vii, viii, 130, 148  
**Forward Trim** \_\_\_\_\_ 48  
**Frame Decorations** \_\_\_\_\_ 93

---

# JMRI® User's Guide Version 2.12

---

Frame Properties	92
<b>Frame Title Components</b>	92
Function labels	97, 100
Function Mapping	iii, iv, 55, 79
Function Panel	v, 93, 99, 100
<b>FX rate adjust</b>	57

---

## G

Global CV Listing	iv, 65, 80
GUI Pane	ii, 13

---

## H

hardware	ii, 1, 4, 8, 113, 137
----------	-----------------------

---

## I

IDENT	25
Idle	99, 124
image	70, 76, 77, 78, 79, 131, 132, 171, 227
Import	vi, ix, 37, 69, 85, 86, 108, 154, 197, 204, 208, 224
Install	ii, 1

---

## K

<b>Kick start</b>	46, 48
-------------------	--------

---

## L

<b>Lamp keep-alive voltage</b>	57
LCD Clock	85, 103
LI101 Configuration Manager	ix, 151
<b>Light Control</b>	vi, 85, 105
Lighting and FX Functions	iii, iv, 56, 79
Linux	1
Listed Table Access	ix, 87, 156, 157
Load Logix Disabled	87
loads serviced	x, 192
Local Car Movement	166
Locale Pane	ii, 14
Locations	vii, ix, x, 87, 94, 106, 117, 160, 163, 175, 177, 178, 179, 181, 182, 195, 198, 199, 238, 239, 240
lock	30, 75, 76
Locomotive Attributes	210, 211, 212
Locomotives	vii, 79, 85, 117, 204

---

LocoNet	vii, 82, 83, 86, 87, 117, 123, 124, 125, 128, 129, 130, 133
Log Message	ix, 87, 156
Logarithmic Speed Curve	53
Logging	224
LZ100 Configuration Manager	ix, 151
LZV100 Configuration Manager	ix, 152

---

## M

Main Menu	v, 87, 174
Main Window	v, 81
Manifest	x, xi, 163, 168, 169, 171, 226, 227, 231, 232, 235, 236, 237
Manifest Options	x, xi, 169, 226
Media Pane	iv, 76, 77, 79
Memory Usage	ix, 86, 154
<b>Messages</b>	ii, vii, xi, 6, 15, 129, 232, 236, 237, 251
<b>Mid Volts</b>	48
Minimize	ix, 87, 94, 159
<b>MiniServer</b>	ii, 7, 18
Monitor Clock	vii, 124, 137
Monitor Slots	vii, 123
Motor Control	iii, iv, 45, 79
Motor Control pane	45
Motor Pane	45
Multi-Decoder Control	iii, 29, 85, 90
Multi-Programmer Control	iii, 22, 29

---

## N

NAC	4
NCE	viii, x, 4, 86, 117, 133, 134, 135, 136, 137, 138, 139, 140, 150, 213, 242

---

## O

Oak Tree Systems	4
OakTreeSystems Menu	viii, 141
off	3, 39, 43, 44, 48, 58, 59, 61, 75, 76, 84, 94, 96, 100, 105, 106, 175, 179, 238, 244
on	ii, 3, 4, 5, 7, 10, 12, 18, 21, 22, 23, 24, 25, 27, 28, 29, 30, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 53, 54, 55, 56, 57, 58, 61, 63, 64, 65, 66, 67, 69, 70, 74, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 89, 91, 96, 97, 98, 99, 100, 101, 105, 106, 107, 109, 111, 113, 115, 116, 118, 119, 121, 122, 123, 125, 131, 132, 134, 135, 137, 138, 139, 141, 142, 146, 147, 149, 150, 151, 153, 158,

---

# JMRI® User's Guide Version 2.12

---

163, 166, 171, 173, 174, 175, 176, 179, 180, 188, 192, 196, 201, 204, 206, 207, 210, 214, 216, 219, 221, 227, 231, 238, 239, 240, 241, 242, 244, 245, 248, 249, 251, 252  
**Operations** \_ i, iii, vi, vii, ix, x, xi, 21, 23, 28, 73, 82, 85, 106, 116, 117, 163, 164, 165, 174, 175, 179, 186, 187, 189, 196, 203, 205, 207, 209, 214, 217, 221, 238, 239, 241, 242  
Operations Mode (Main Track) Programmer \_ iii, 21, 23, 28, 82  
Ops Mode Programming \_\_\_\_\_ iii, 28

---

## P

Panels \_\_\_\_\_ v, vi, 86, 91, 113, 115, 156, 164, 175  
PI Engineering \_\_\_\_\_ 4  
Power Control \_\_\_\_\_ vi, 84, 85, 87, 103, 159  
Power Source \_\_\_\_\_ 44  
PR1DOS file \_\_\_\_\_ 69  
PR1WIN file \_\_\_\_\_ 69  
PR3 Mode \_\_\_\_\_ vii, 130  
Preferences v, vii, 5, 24, 25, 73, 78, 85, 86, 90, 95, 117, 165  
PRICOM \_\_\_\_\_ ix, 87, 157  
Primary address \_\_\_\_\_ 43  
Print Decoder Definitions \_\_\_\_\_ v, 84, 87  
Print Options \_\_\_\_\_ x, xi, 168, 225  
Print Preview \_ v, vi, 68, 84, 86, 88, 109, 198, 209, 231, 232  
Print Summary \_\_\_\_\_ vi, 86, 108, 112  
Print Train by Car Types \_\_\_\_\_ xi, 228  
Printing Decoder Data \_\_\_\_\_ iv, v, 68, 80  
Pro Trak Grapevine \_\_\_\_\_ 4  
Programmer format \_\_\_\_\_ 73  
programmers \_\_\_\_\_ iii, 22, 25, 39, 40, 41, 66, 107, 155  
Programmers \_\_\_\_\_ v, 66, 85, 90, 155  
Programming Modes \_\_\_\_\_ iii, 22, 27, 45

---

## Q

QSI \_\_\_\_\_ viii, 4, 34, 49, 54, 86, 117, 142  
Quick Speed Matching \_\_\_\_\_ 52  
Quick Start \_\_\_\_\_ x, 165

---

## R

READ TYPE \_\_\_\_\_ 25  
Recreate Decoder Index \_\_\_\_\_ ix, 86, 155, 247  
**Reverse Trim** \_\_\_\_\_ 48  
Roco \_\_\_\_\_ 4

---

Rosteri, ii, iii, iv, v, vi, ix, 6, 15, 25, 33, 34, 36, 37, 39, 41, 65, 73, 74, 76, 77, 78, 79, 85, 86, 92, 93, 97, 100, 107, 110, 111, 112, 113, 155, 197, 204, 205, 206, 207, 209  
roster Group \_\_\_\_\_ 110, 111, 112  
Roster Group \_\_\_\_\_ i  
Roster Media \_\_\_\_\_ i  
Route\_xi, 168, 174, 192, 193, 215, 216, 217, 218, 219, 220, 221, 232  
Routes \_ vii, ix, x, 85, 87, 106, 117, 157, 158, 193, 214, 216, 217, 239  
RPS Alignment Tool \_\_\_\_\_ viii, 145  
RPS Menu \_\_\_\_\_ viii, 142  
RPS Monitor \_\_\_\_\_ viii, 142  
RPS Polling Control \_\_\_\_\_ viii, 143  
RPS Receiver Control \_\_\_\_\_ viii, 143  
RPS Sound Speed Monitor \_\_\_\_\_ viii, 145  
Run Script \_\_\_\_\_ vi, 116

---

## S

Schedule \_\_\_\_\_ x, 167, 176, 181, 193, 224  
Script \_\_\_\_\_ vi, 6, 10, 116, 225  
Script Entry \_\_\_\_\_ vi, 116  
Script Output \_\_\_\_\_ vi, 116  
SECSI Menu \_\_\_\_\_ viii, 146  
Send Comamnd \_\_\_\_\_ viii, 147  
Send Command \_\_\_\_\_ vii, viii, ix, 118, 119, 121, 122, 134, 141, 142, 146, 147, 148, 149, 150, 153  
Send DCC Packet \_\_\_\_\_ vi, 85, 106  
Sensor Groups \_\_\_\_\_ vi, 85, 103  
Service Mode \_\_\_\_\_ iii, 21, 23, 25, 27, 28, 29, 73, 82, 85, 90  
Service Mode (Programming Track) Programmer \_\_\_\_\_ iii, 21, 82  
Service Mode Programmer \_\_\_\_\_ iii, 23, 27, 28, 73, 82, 85, 90  
Set Train Icons Coordinates \_\_\_\_\_ 216, 218  
set up \_\_\_\_\_ ii, iii, 4, 5, 6, 7, 11, 21, 37, 47, 52, 59, 60, 143, 220, 221  
Settings \_\_\_\_\_ vii, x, 8, 38, 85, 102, 106, 117, 164, 165, 174, 238, 239  
Show Cabs \_\_\_\_\_ 137  
shunt \_\_\_\_\_ 76  
Simple Programmer \_\_\_\_\_ iii, 27, 90  
Simple Signal Logic \_\_\_\_\_ 103  
Sound File \_\_\_\_\_ vii, 133  
Sound FX \_\_\_\_\_ iv, 63, 80  
Sound Levels \_\_\_\_\_ iv, 63, 64, 80  
Speed stabilization \_\_\_\_\_ 46  
speed steps \_\_\_\_\_ 44  
**Speed Table** \_\_\_\_\_ iii, iv, 45, 47, 48, 49, 79  
Speedometer \_\_\_\_\_ vi, 85, 104  
SPROG \_\_\_\_\_ viii, 4, 86, 117, 147, 148

---

# JMRI® User's Guide Version 2.12

---

SRCP	4
Start Mini Web Server	ix, 87, 158
<b>Start Up</b>	ii, 6, 11, 12
<b>Start Volts</b>	48
Straight Line Speed Curve	50
Submitting	xi, 248
Switch Lists by Location	xi, 232, 233
<b>Switcher Speed Curve</b>	52
System connection	8
System manufacturer	7

---

## T

Testing	xi, 247
The throttle slider	98
Thread Monitor	vi, 116
<b>Throttle</b>	ii, v, vii, ix, 6, 16, 76, 82, 85, 87, 91, 92, 93, 94, 95, 96, 99, 100, 101, 102, 112, 124, 129, 158, 159
TMCC Monitor	viii, 149
Tools	v, x, xi, 66, 85, 90, 163, 164, 165, 176, 180, 196, 197, 200, 204, 213, 215, 216, 217, 221, 222, 223, 227, 228, 231, 239
Trains	vii, ix, xi, 85, 106, 117, 163, 165, 171, 173, 185, 192, 193, 200, 221, 222, 223, 227, 228, 231, 235, 237, 238, 239, 242, 244
Transponding	61, 67
Turnout Control	vi, 85, 103

## U

Uhlenbrock	4
------------	---

USB Device Viewer	ix, 87, 158
USB Input Control	ix, 87, 158

---

## V

Validate XML File	ix, 86, 155
<b>Vhigh</b>	47, 48
<b>Vmid</b>	47, 48
<b>Vstart</b>	47, 48

---

## W

Wangrow	viii, 4, 149
Window_v	viii, ix, x, xi, 82, 85, 87, 92, 94, 95, 96, 101, 118, 119, 121, 122, 123, 125, 129, 134, 138, 139, 140, 141, 142, 143, 146, 147, 149, 150, 153, 159, 161, 165, 175, 178, 179, 182, 183, 196, 197, 199, 203, 209, 210, 214, 216, 217, 218, 221, 224, 228, 231
WiThrottle Pane	ii, 16
Writing	28, 29, 39

## X

X10	4
-----	---

---

Zimo	ix, 4, 40, 86, 117, 153
ZTC	4