



<http://www.trainweb.org/nrmrc>

Test Division

Straight Line Diagram, Block Detection,
Transponding, and Simple Signal Logic with JMRI



By: David McDowell, John Wallis and Dave Thompson

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<http://jmri.sourceforge.net>



<http://www.digitrax.com>

Layout purpose:

Test Division was created to test and document the basics of how to use Digitrax equipment with JMRI software for computer interaction with a layout. **One of our turnouts is reversed for a little extra challenge.

Digitrax equipment:

Zephyr (DCS50) command station

DS64 to control 4 turnouts

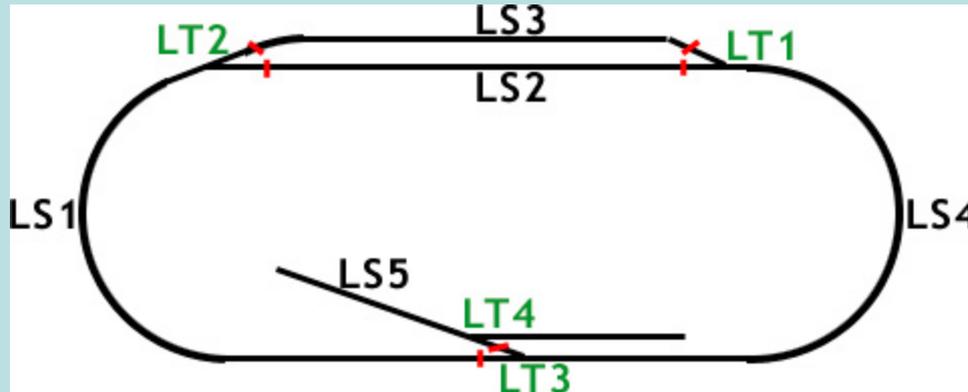
BDL168 for block occupancy detection, 16 blocks

RX4 is 4 RX1 connected to BDL168 for transponding, 4 zones

SE8C signal control (could also control turnouts)

SMBK signal mast base kit (signal heads)

Understand your Layout in JMRI terms



Label a drawing of your layout using these terms:

LT = LocoNet Turnout (to label turnouts off the DS64)
LS = LocoNet Sensor (to label blocks off the BDL168)

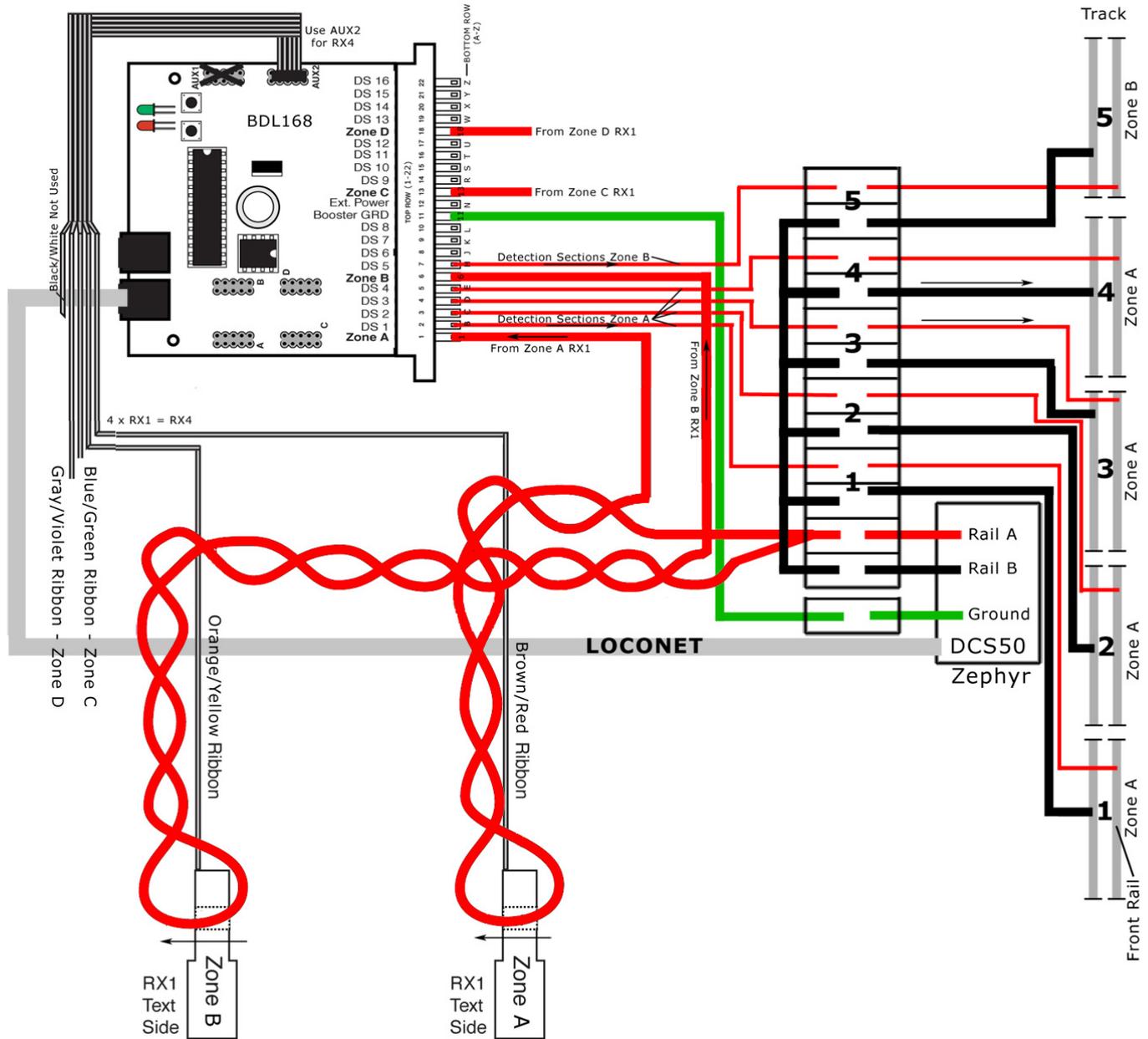
Our mainline runs (counter-clockwise) through these blocks: LS1, LS4, LS2
Our passing siding is LS3
Our industry spur is LS5

Other terms you will run across in this presentation:

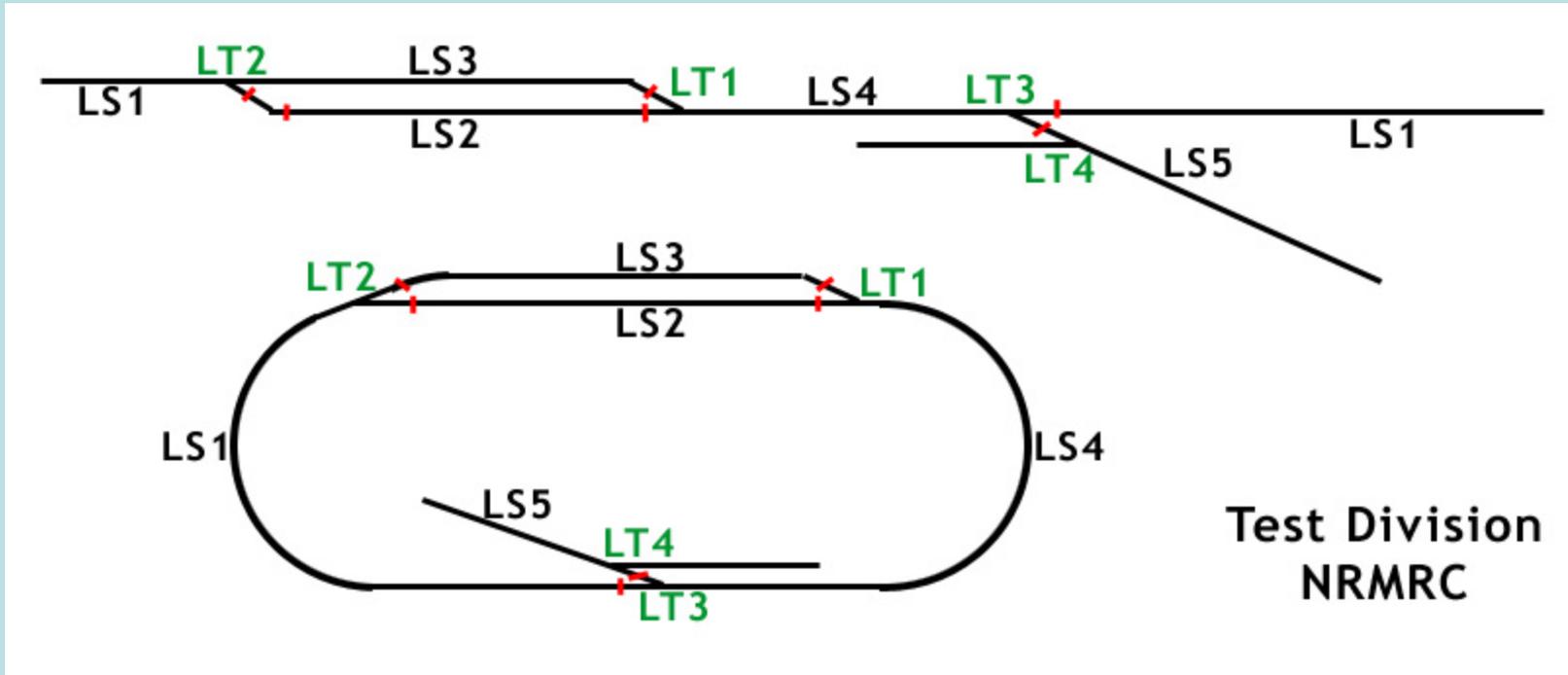
LR = LocoNet Reporter

LH = LocoNet Head (signal head)

Wiring to BDL168 and RX4



Turn your Layout into a Straight Line drawing



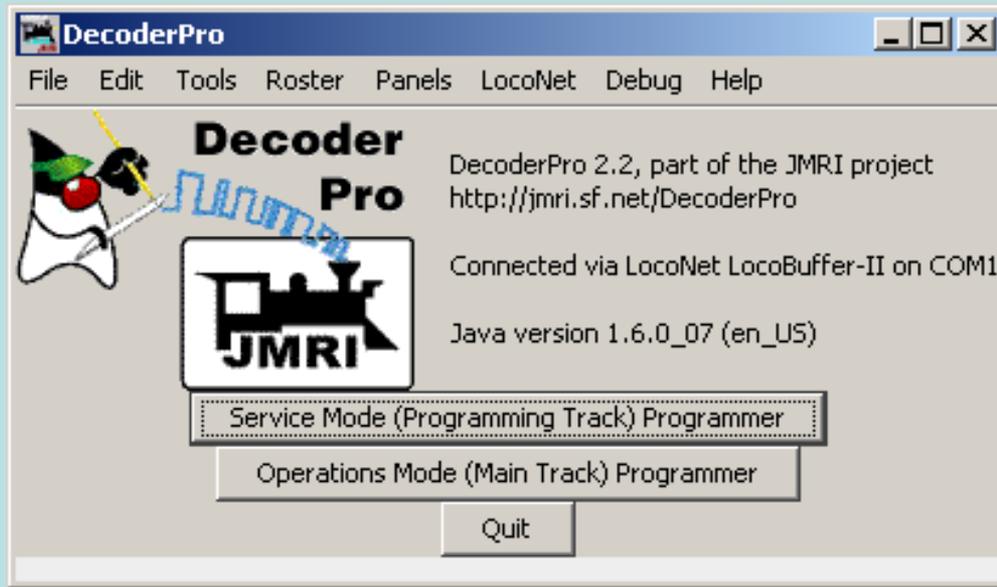
Label your Straight Line drawing using these terms:

LT = LocoNet Turnout

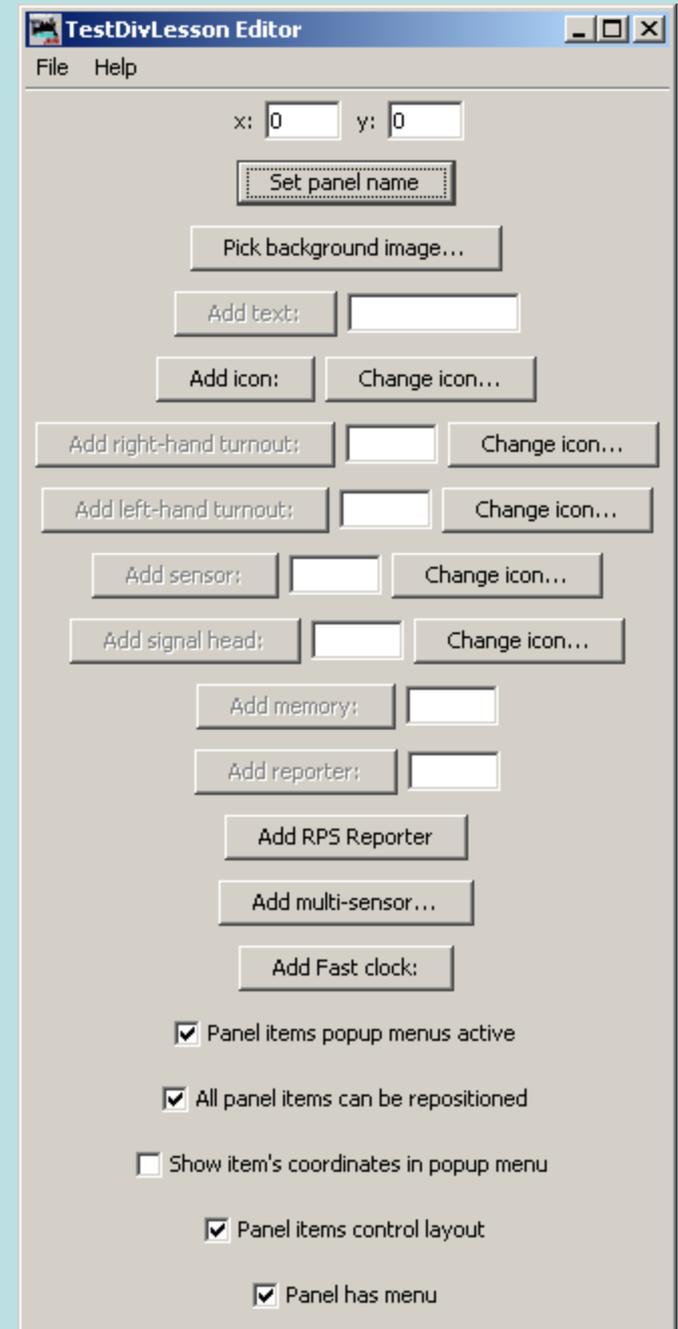
LS = LocoNet Sensor (represents block number)

Begin Creating your Panel in JMRI

(finished diagram on slide 10)



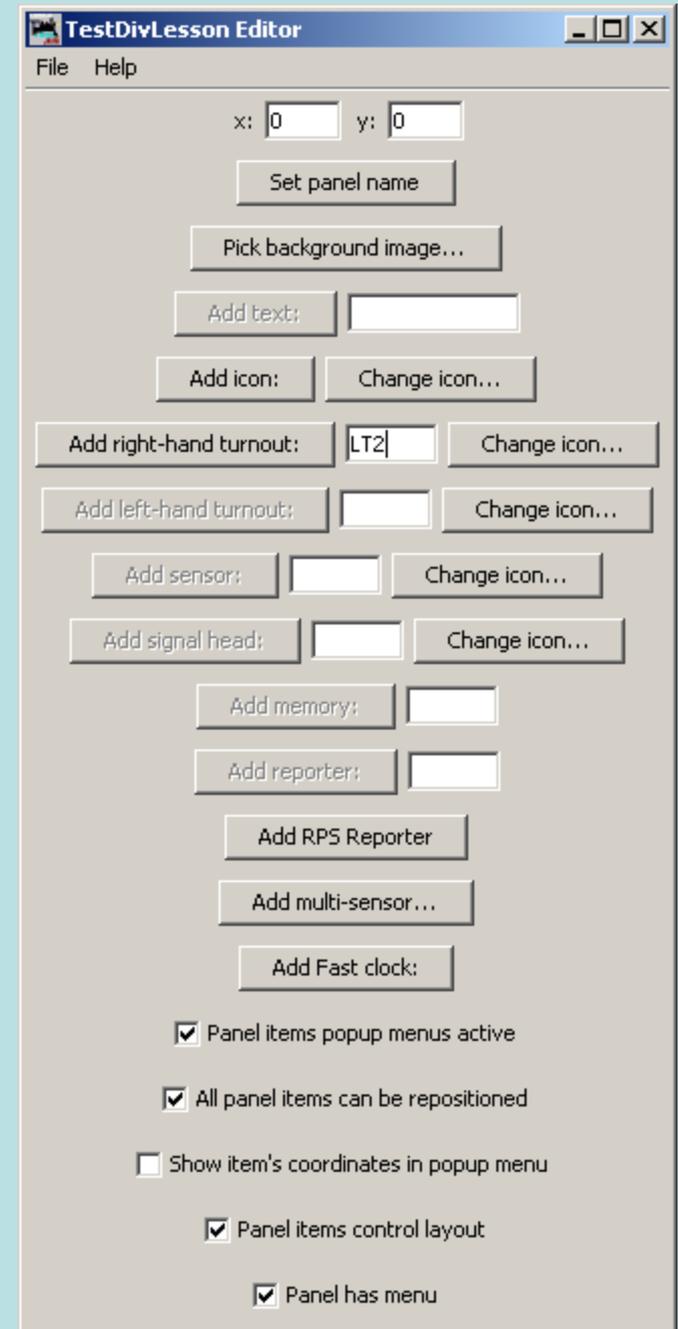
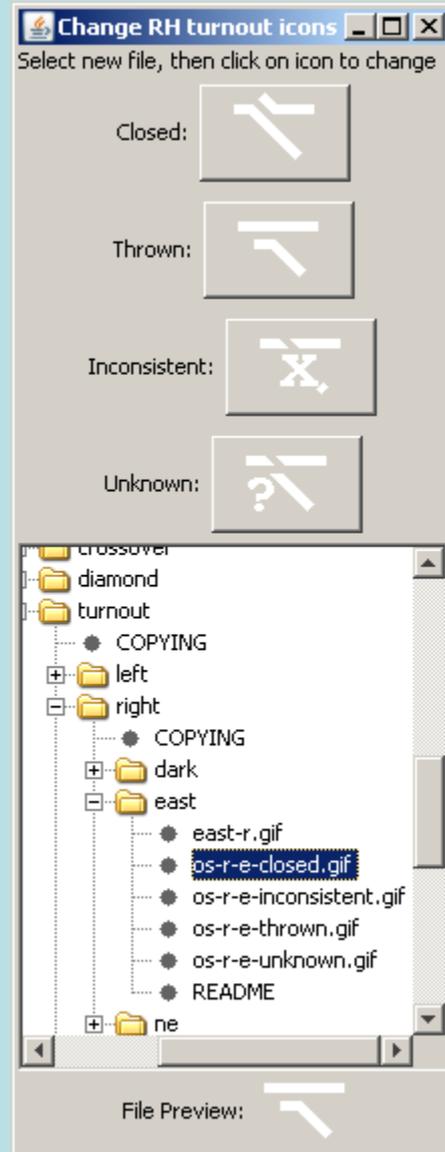
1. Launch DecoderPro
2. Choose Panels, New panel...
3. Panel Editor
4. Set panel name
5. Resize the panel window to fit your project



Begin Creating your Panel in JMRI

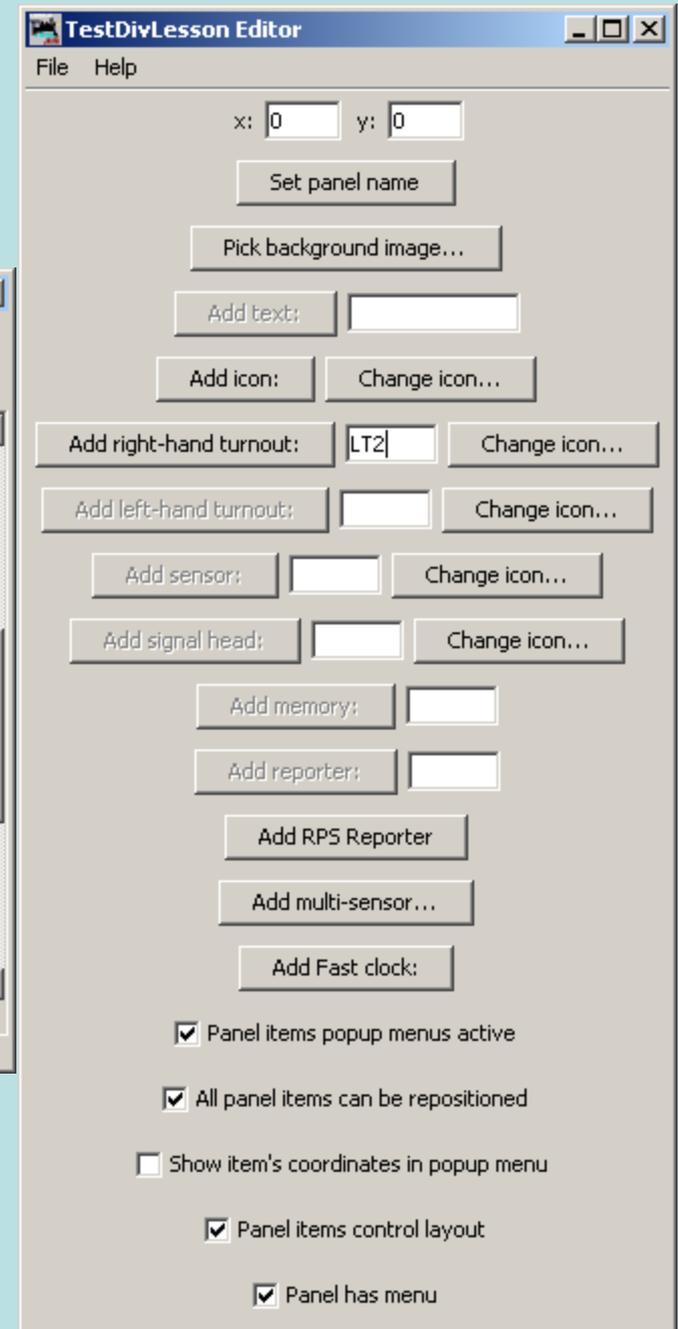
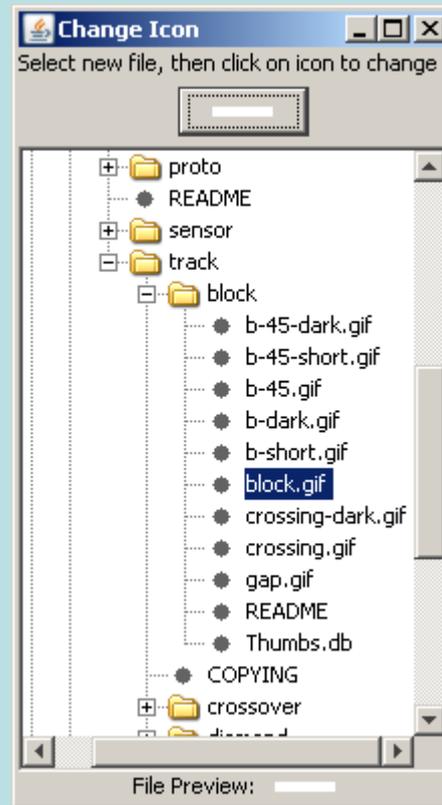
(finished diagram on slide 10)

1. Start from left side of straight line diagram, first is **LT2**, a right-hand turnout
2. Change Icon, use correct pictures for correct turnout position, normal or thrown (the **LT2** turnout is opposite for mainline as you can see on the layout and here in the icon selection window)
3. Add right-hand turnout
4. Move into position on panel using right-click to drag
5. Test **LT2** (click the icon)



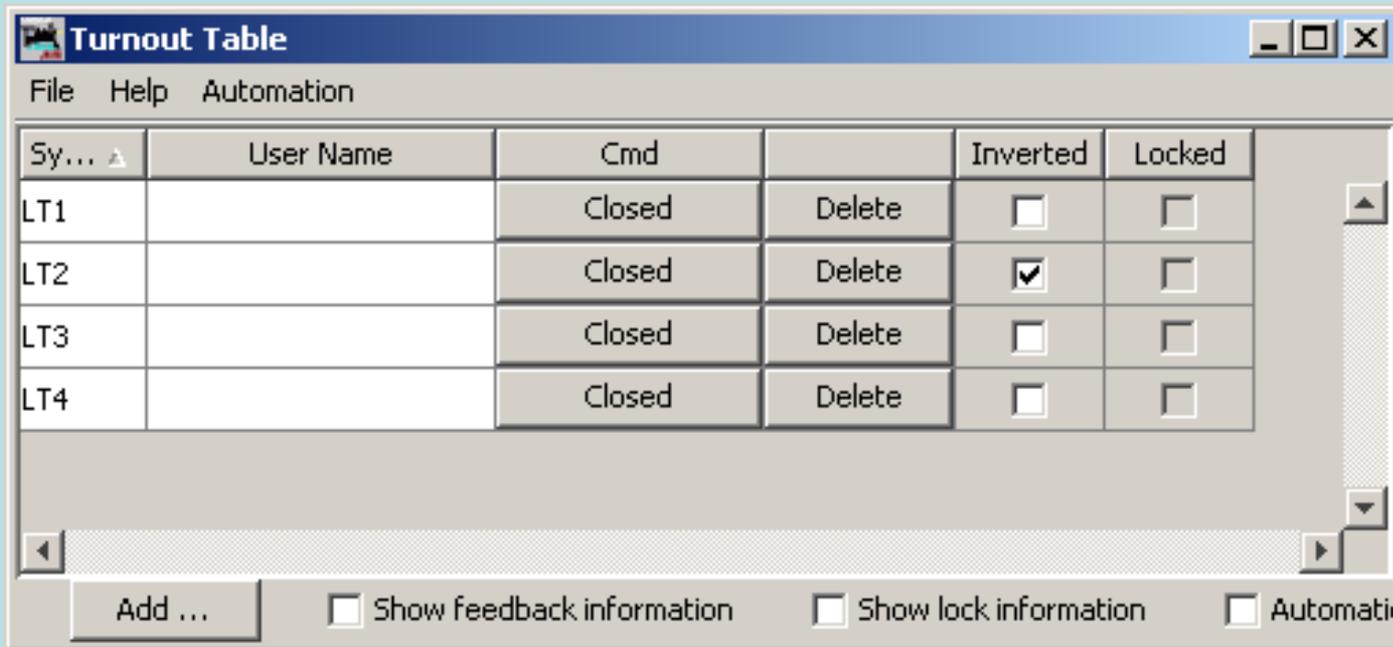
Continue Creating your Panel in JMRI

1. Add straight pieces by using the Change icon... then Add icon: buttons
2. Move the pieces into place and plan to leave gaps at insulated joiners
3. Continue adding straight track and turnouts
4. Make sure you choose correct left or right for turnouts and add the proper turnout name when you add each turnout
5. Add text to labels to your blocks



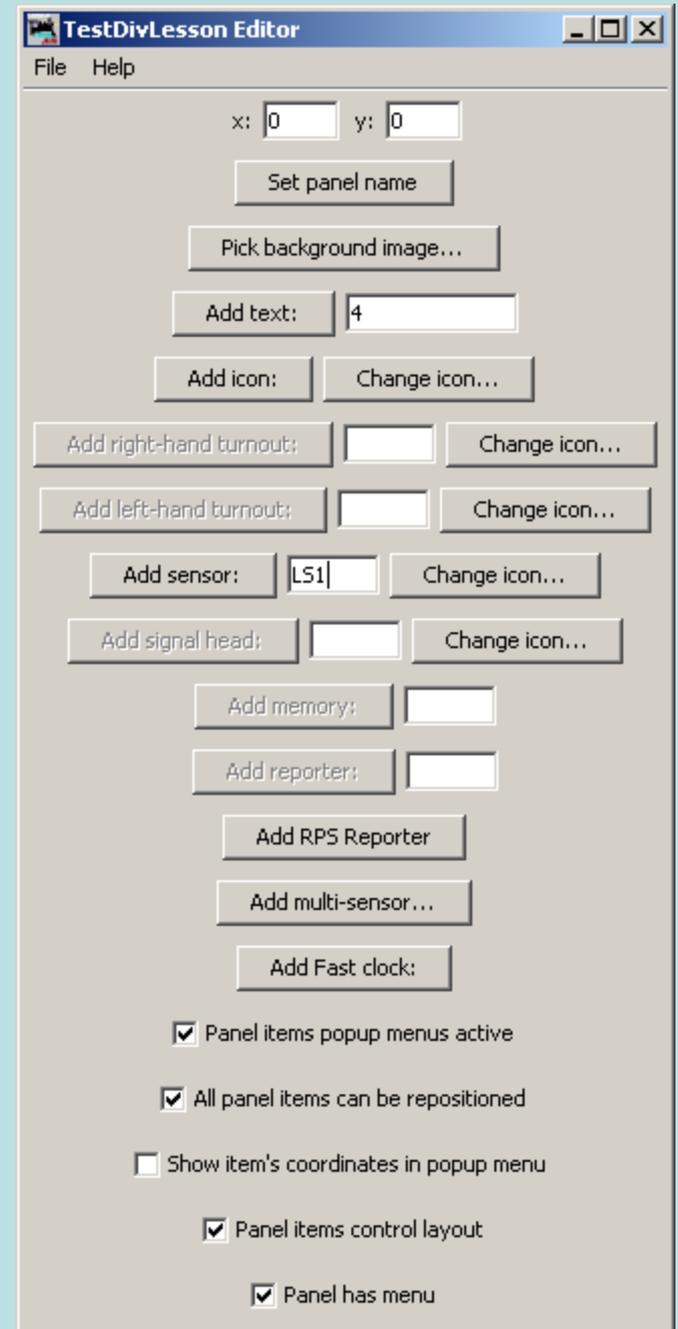
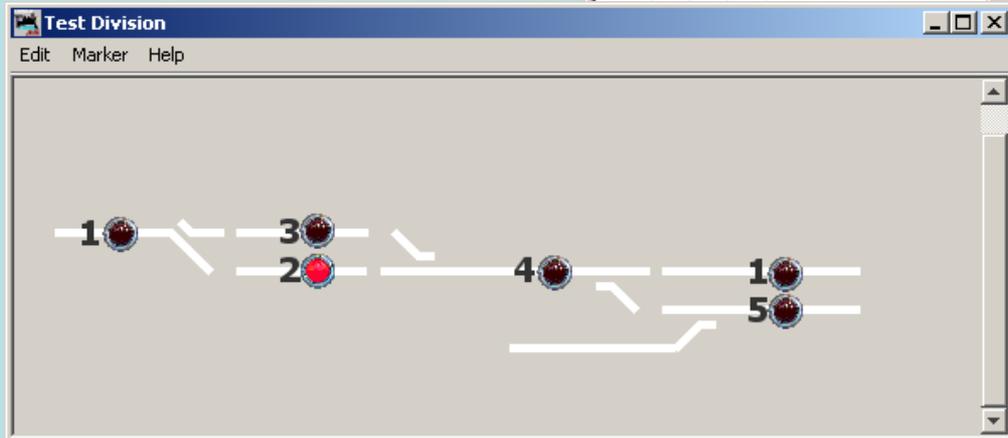
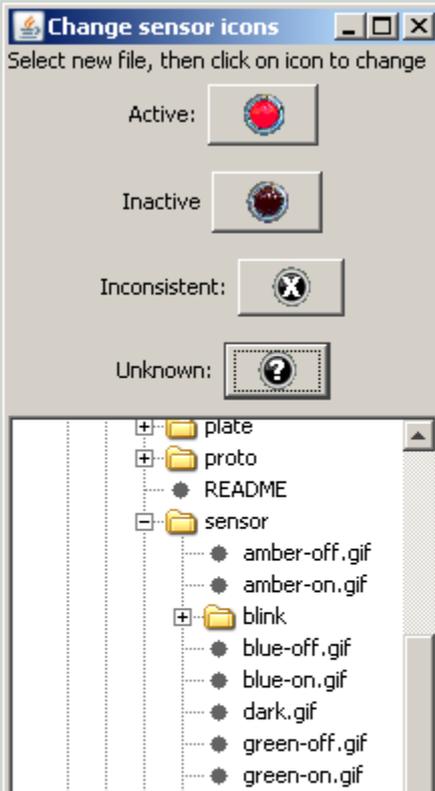
Edit Turnout Table

Recall turnout **LT2** is reversed? Not only did we have to choose the opposite icons for the graphic in the straight line diagram, but we need to set that turnout as “inverted” in the turnout table. Click Tools, Tables, Turnouts. Check the box for **LT2** and re-test your turnout.



Block Occupancy

1. Add block detection sensors to the panel
2. Use LS1 twice as block 1 is on each end of the straight line diagram
3. Put a loco on the track, select it, see if the correct block highlights
4. Dispatch your loco



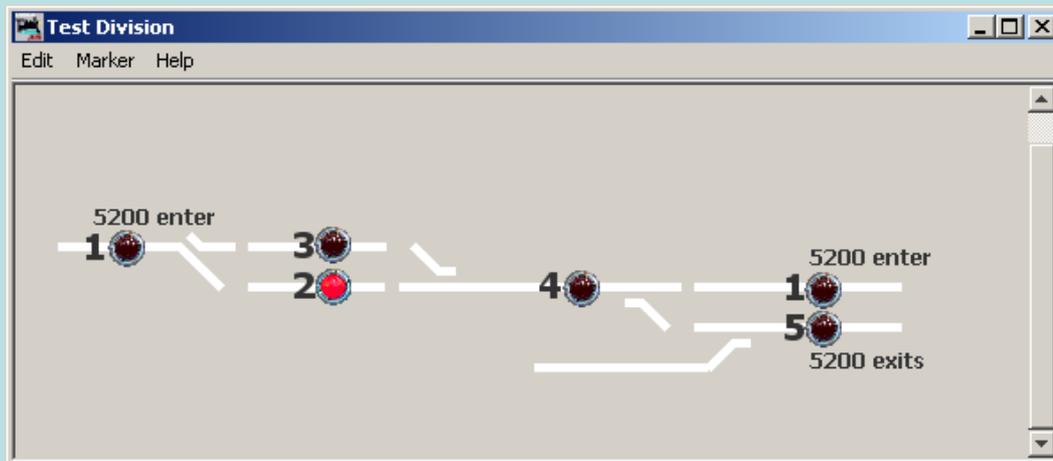
Transponding

Add reporters for Transponding, LR1 and LR3. LR3 covers only block 5 on this layout.

For your first BDL168:
LR1 = block 1-4
LR3 = block 5-8
LR5 = block 9-12
LR7 = block 13-16

(For Transponding to work, you need decoders that support it. Turn on the proper CV per the decoder's instructions.)

(Future plans include even number reporters however they are not used today.)



x: 0 y: 0

Set panel name

Pick background image...

Add text: 4

Add icon: Change icon...

Add right-hand turnout: Change icon...

Add left-hand turnout: Change icon...

Add sensor: LS1 Change icon...

Add signal head: Change icon...

Add memory:

Add reporter: LR1

Add RPS Reporter

Add multi-sensor...

Add Fast clock:

Panel items popup menus active

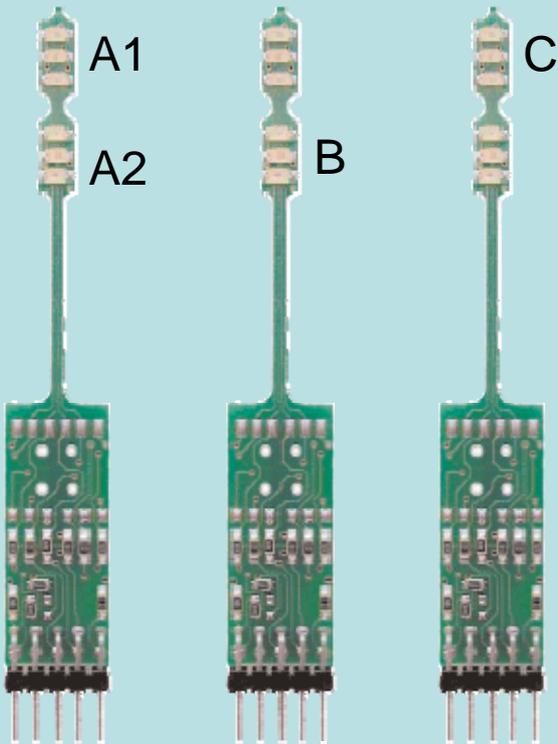
All panel items can be repositioned

Show item's coordinates in popup menu

Panel items control layout

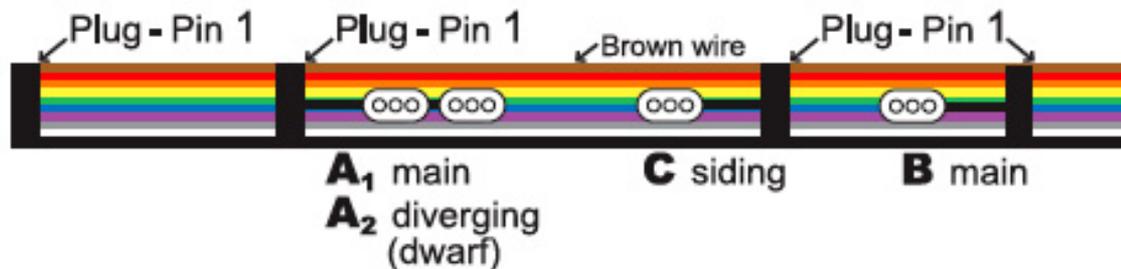
Panel has menu

Signals and Simple Signal Logic!



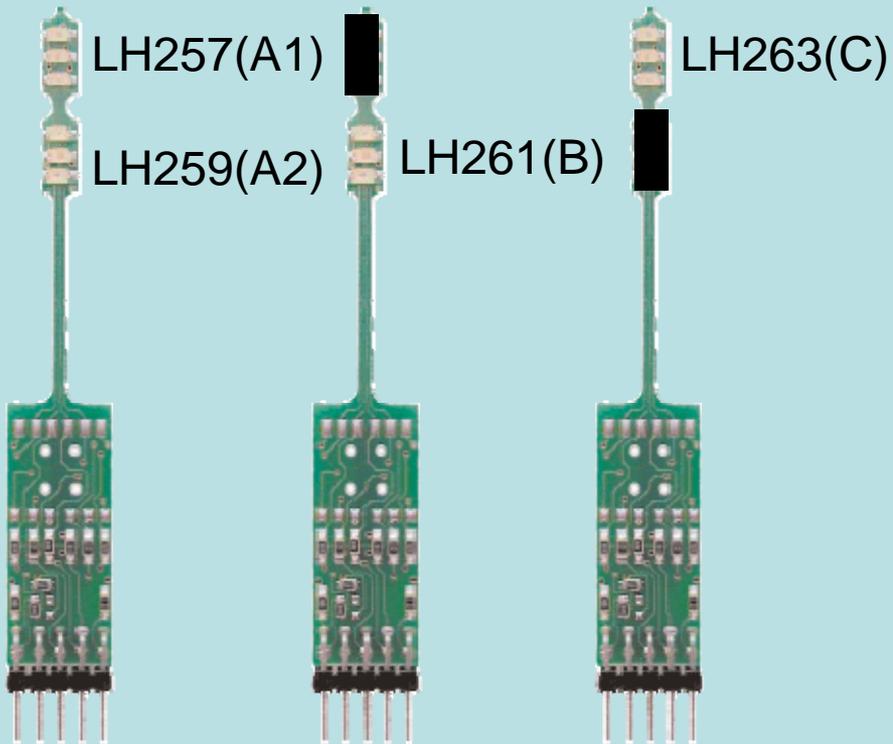
Signals are GREAT fun to add to a layout, but going into it with a little knowledge goes a LONG way to making Simple Signal Logic easier to understand.

On our SE8C board (Board ID 01) our signal head ranges from Sw257-Sw320 on DRV (driver) 1-8. (see pg 8 of the SE8C manual at the 4 aspect per head column <http://www.digitrax.com/ftp/se8c.pdf>) The manual calls them signal switch addresses, but if you try to use “Sw257” to address the first signal head in JMRI’s Simple Signal Logic, you will find out quickly it doesn’t work.



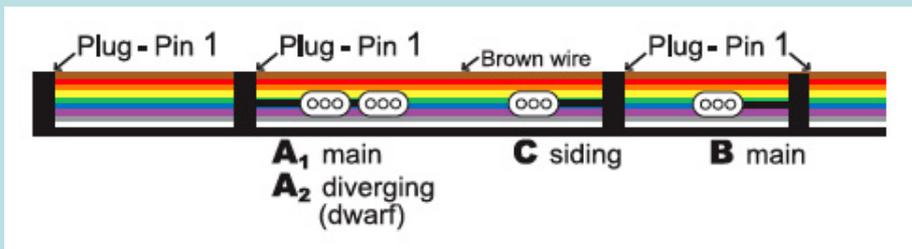
Know your signal heads!

DRV1:



Now we are looking at the cable for DRV1 (left) and the related LocoNet addresses. Make sure you follow the directions when crimping the 10 pin connectors to the 10 wire driver cable. After that, insert the signal heads into the connectors, plug into the SE8C and prepare to setup your first group of signals around turnout 1 (LT1). Just follow the labeling you see to the left and see below for DRV2 and DRV3.

Put a small piece of black electric tape around the portion of the signal head that is not used. **DO NOT cut these off unless you know what you are doing!**

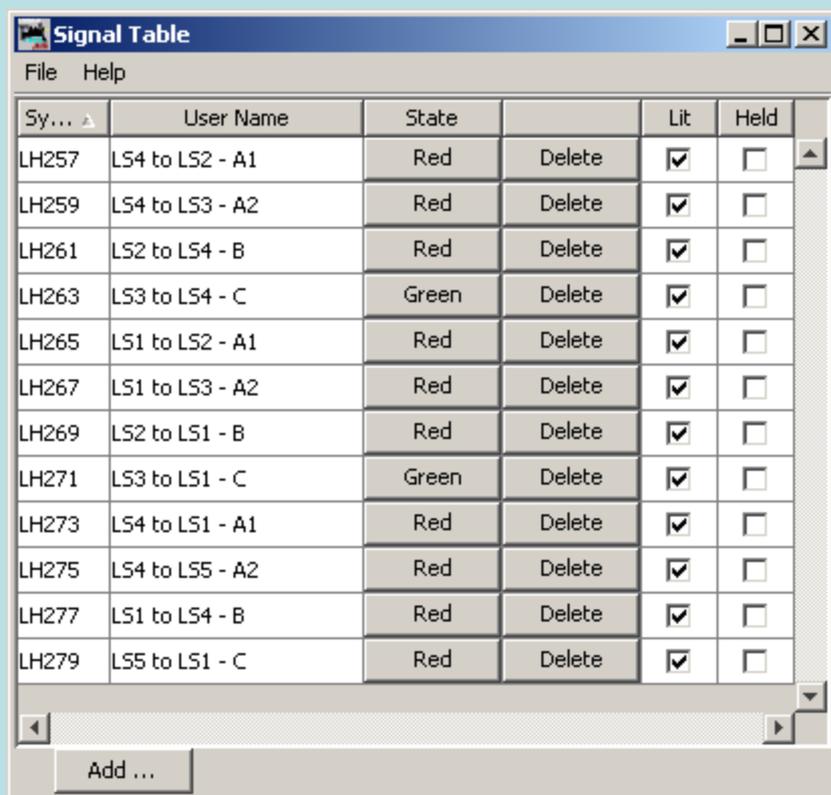


DRV2:
LH265(A1)
LH267(A2)
LH269(B)
LH271(C)

DRV3:
LH273(A1)
LH275(A2)
LH277(B)
LH279(C)

Simple Signal Logic - Signal Table

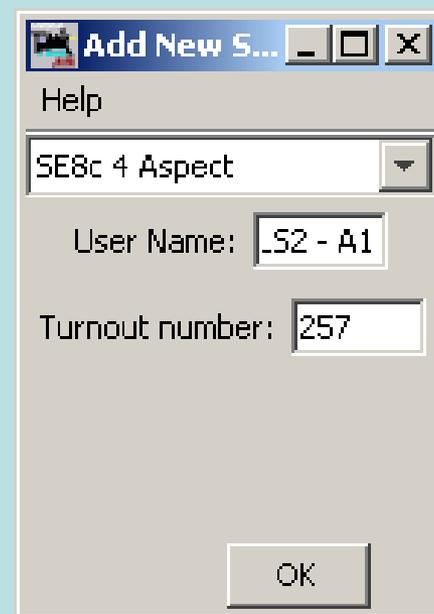
Click Tools, Tables, Signals to open the Signal table. Click Add... to begin adding signals. Note we don't enter Sw or LH into the "Turnout number:" field, only the number. The "User Name:" column is for your own labeling. We are using the LocoNet Sensor numbers (blocks) in our labeling... telling us which block to which block and what signal head it relates to. Add your signal heads to the signal table as "SE8c 4 Aspect".



Sy... ▾	User Name	State		Lit	Held
LH257	LS4 to LS2 - A1	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH259	LS4 to LS3 - A2	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH261	LS2 to LS4 - B	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH263	LS3 to LS4 - C	Green	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH265	LS1 to LS2 - A1	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH267	LS1 to LS3 - A2	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH269	LS2 to LS1 - B	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH271	LS3 to LS1 - C	Green	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH273	LS4 to LS1 - A1	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH275	LS4 to LS5 - A2	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH277	LS1 to LS4 - B	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>
LH279	LS5 to LS1 - C	Red	Delete	<input checked="" type="checkbox"/>	<input type="checkbox"/>

File Help

Add ...



Add New S... _ _ X

Help

SE8c 4 Aspect ▾

User Name:

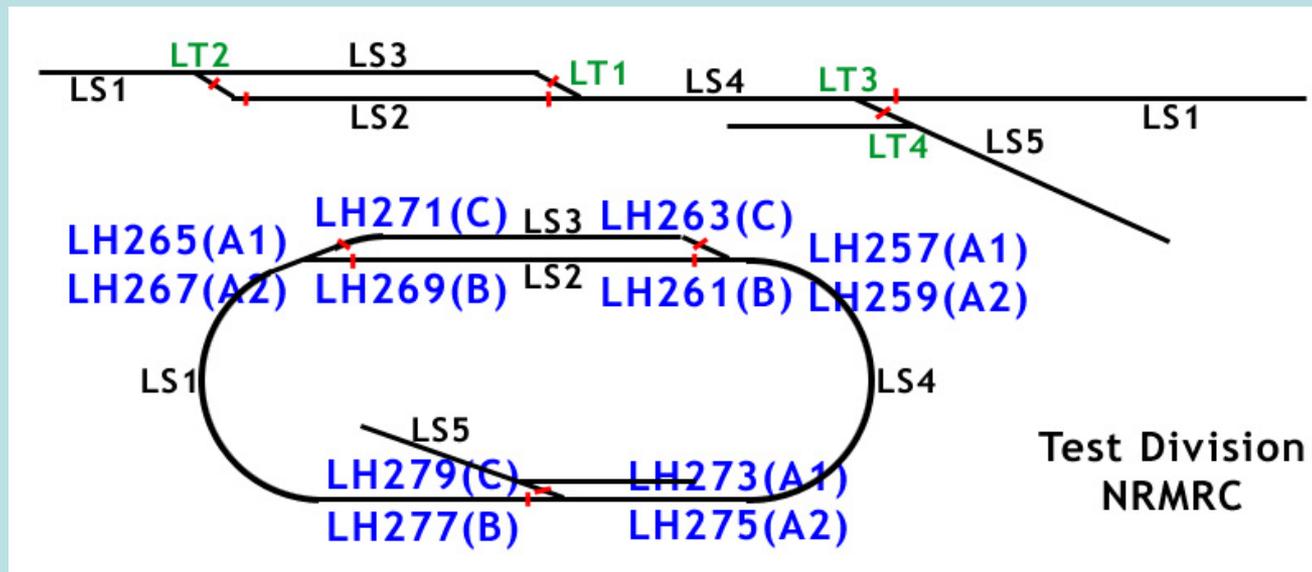
Turnout number:

OK

Simple Signal Logic - continued

We know the SE8C manual calls for Sw257, however that won't work. You must enter the LH+number for the signal head you are working on. ** As you enter logic data into a signal head setting, after you click apply, it will remember those settings (don't forget to store your panel!!). To bring up the logic of a particular signal head, type in the signal head's LH+number and press Enter.

A good diagram goes a LONG way. This one might not make sense now, but it will as you progress.



The next 2 slides will show the screenshots of the settings for the signal heads on DRV1.

Simple Signal Logic – DRV1

To open the Signal Logic window, click Tools, Simple Signal Logic

DRV1 – A1

Signal logic for LH257

File Help

Signal Named

On Single Block

Main Leg of Turnout

Diverging Leg of Turnout Signal head for main track through turnout in either direction

On Facing-Point Turnout

Protects Sensor/s

Red When Turnout Is Thrown

Protects Signal Limited Speed

With Flashing Yellow Is Distant Signal

Approach Lighting Sensor

Apply

Type LH257 and hit enter. This is A1, the top signal head. A1 is for the mainline (main leg), which means this signal protects LS2 and is red when LT1 is thrown (as thrown would go to the siding). It also protects signal LH269, which is B on DRV2.

DRV1 – A2

Signal logic for LH259

File Help

Signal Named

On Single Block

Main Leg of Turnout

Diverging Leg of Turnout Signal head for branching track through turnout in either direction

On Facing-Point Turnout

Protects Sensor/s

Red When Turnout Is Closed

Protects Signal Limited Speed

With Flashing Yellow Is Distant Signal

Approach Lighting Sensor

Apply

Type LH259 and hit enter. This is A2, the bottom signal head. A2 is for the siding (diverging leg), which means this signal protects LS3 and is red when LT1 is closed (as closed would go to the mainline). It also protects signal LH271, which is C on DRV2.

Simple Signal Logic – DRV1

DRV1 – B

The screenshot shows a window titled "Signal logic for LH261". The "Signal Named" field contains "LH261". Under the "On Single Block" section, the "Main Leg of Turnout" radio button is selected. The "Protects Sensor/s" field contains "LS4". The "Red When Turnout" field contains "LT1" and "Is Thrown" is selected. The "Protects Signal" fields contain "LH273" and "LH275", with "Limited Speed" checked. "With Flashing Yellow" and "Is Distant Signal" are unchecked. The "Approach Lighting Sensor" field is empty. An "Apply" button is at the bottom.

Type LH261 and hit enter. This is B, the bottom signal head. B is for the mainline (main leg). It protects LS4 and is red when LT1 is thrown. It also protects signal LH273 (A1) and LH275 (A2) on DRV3.

DRV1 – C

The screenshot shows a window titled "Signal logic for LH263". The "Signal Named" field contains "LH263". Under the "On Single Block" section, the "Diverging Leg of Turnout" radio button is selected. The "Protects Sensor/s" field contains "LS4". The "Red When Turnout" field contains "LT1" and "Is Closed" is selected. The "Protects Signal" fields contain "LH273" and "LH275", with "Limited Speed" checked. "With Flashing Yellow" and "Is Distant Signal" are unchecked. The "Approach Lighting Sensor" field is empty. An "Apply" button is at the bottom.

Type LH263 and hit enter. This is C, the top signal head. C is for the siding (diverging leg). It protects LS4 and is red when LT1 is closed. It also protects signal LH273 (A1) and LH275 (A2) on DRV3.

Simple Signal Logic – DRV2

(don't forget LT2 is reversed in Test Division)

DRV2 – A1

Type LH265 and hit enter. This is A1, the top signal head. A1 is for the mainline (main leg), which means this signal protects LS2 and is red when LT2 is thrown (as thrown would go to the siding). It also protects signal LH261, which is B on DRV1.

DRV2 – A2

Type LH267 and hit enter. This is A2, the bottom signal head. A2 is for the siding (diverging leg), which means this signal protects LS3 and is red when LT2 is closed (as closed would go to the mainline). It also protects signal LH263, which is C on DRV2.

DRV2 – B

Type LH269 and hit enter. This is B, the bottom signal head. B is for the mainline (main leg). It protects LS1 and is red when LT2 is thrown. It also protects signal LH277 (B) on DRV3.

DRV2 – C

Type LH271 and hit enter. This is C, the top signal head. C is for the siding (diverging leg). It protects LS1 and is red when LT2 is closed. It also protects signal LH277 (B) on DRV3.

Simple Signal Logic – DRV3

DRV3 – A1

Type LH273 and hit enter. This is A1, the top signal head. A1 is for the mainline (main leg), which means this signal protects LS1 and is red when LT3 is thrown (as thrown would go to the siding). It also protects signal LH265 (A1) and LH267 (A2) on DRV2.

DRV3 – A2

Type LH275 and hit enter. This is A2, the bottom signal head. A2 is for the siding (diverging leg), which means this signal protects LS3 and is red when LT3 is closed (as closed would go to the mainline). It has no signal to protect as this enters a siding that has no other connections.

DRV3 – B

Type LH277 and hit enter. This is B, the bottom signal head. B is for the mainline (main leg). It protects LS4 and is red when LT3 is thrown. It also protects signal LH257 (A1) and LH259 (A2) on DRV1.

DRV3 – C

Type LH279 and hit enter. This is C, the top signal head. C is for the siding (diverging leg). It protects LS4 and is red when LT3 is closed. It also protects signal LH257 (A1) and LH259 (A2) on DRV1.

Test Division

So there it is folks, JMRI in a nutshell on a small simple layout called Test Division with one tricky turnout for good measure, connected to Digitrax equipment, using a LocoBuffer II.

This presentation should have you:

- Understanding some JMRI terminology
 - Labeling with JMRI in mind
 - Creating a straight line diagram
 - Remote Turnout Control
 - Block Occupancy Detection
- Transponding (if your loco decoder can do it)
- Signals with Simple Signal Logic