Cleveland NMRA 2014
Control Panel Editor

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JMRI Control Panel Editor
for
Modern Style Dispatching Panels

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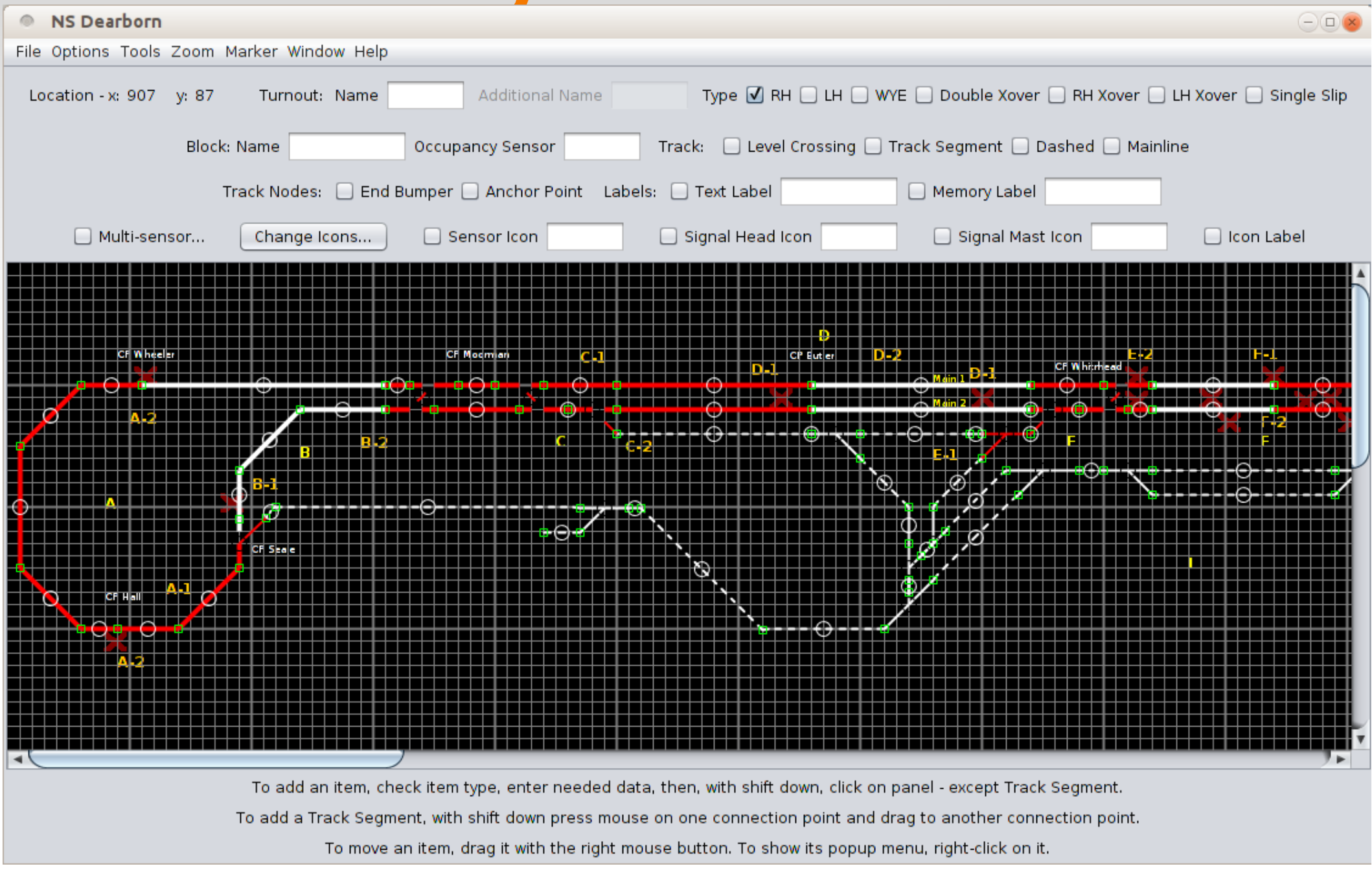
Types of JMRI PanelPro Editors

- Layout Editor
- Panel Editor
- Control Panel Editor

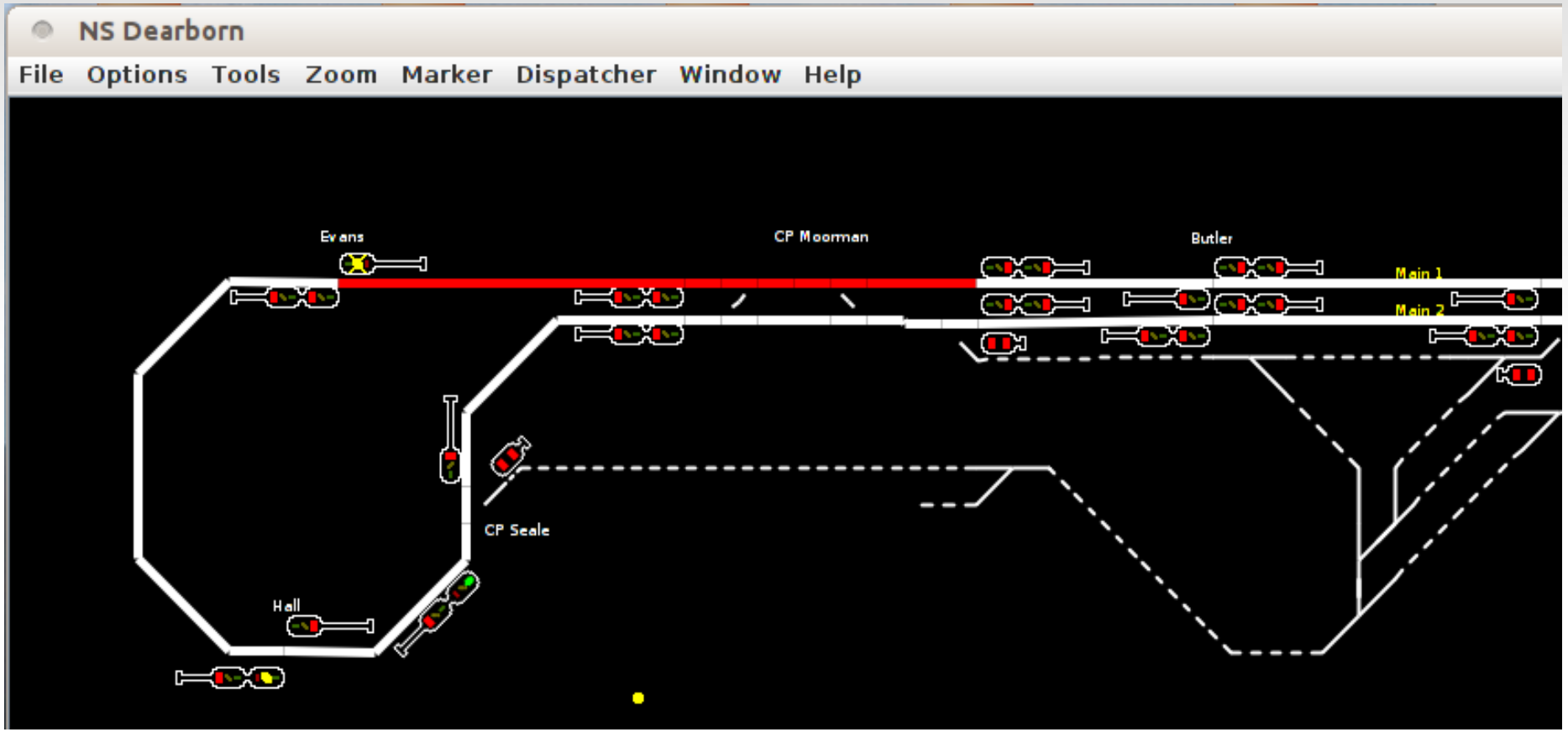
Editor Types

Type	Images	Unique Features	Track styles	Signal Control	Train Automation
Layout Editor	Vector based track images and raster based background images	Captures the full connectivity of your layout as you draw it. Only single instances of each vector Item are allowed. Predetermined look and feel.	Vector based items may show both animation and occupancy.	SSL Logix Masts	Uses **Dispatcher** and **Transits.**
Panel Editor	Raster Images used for both track and background images	Multiple instances of any Item are allowed. Uses both supplied and custom images as required for panel visual fidelity.	Raster Images used to show animation. Occupancy info possible, but difficult, to show using track colors.	SSL Logix Masts	None other than by **Scripting**.
Control Panel Editor	Raster Images used for both track and background	Multiple instances of any Item allowed. Uses both supplied and custom images as required for panel	Raster Images to show animation. Occupancy and automated train status info shown.	SSL Logix Masts	Uses **Warrants**, **OBlocks**, and **Portals**. Use of **Masts** allows automated trains to operate at signal indicated speeds. Train recording supported.

Layout Editor

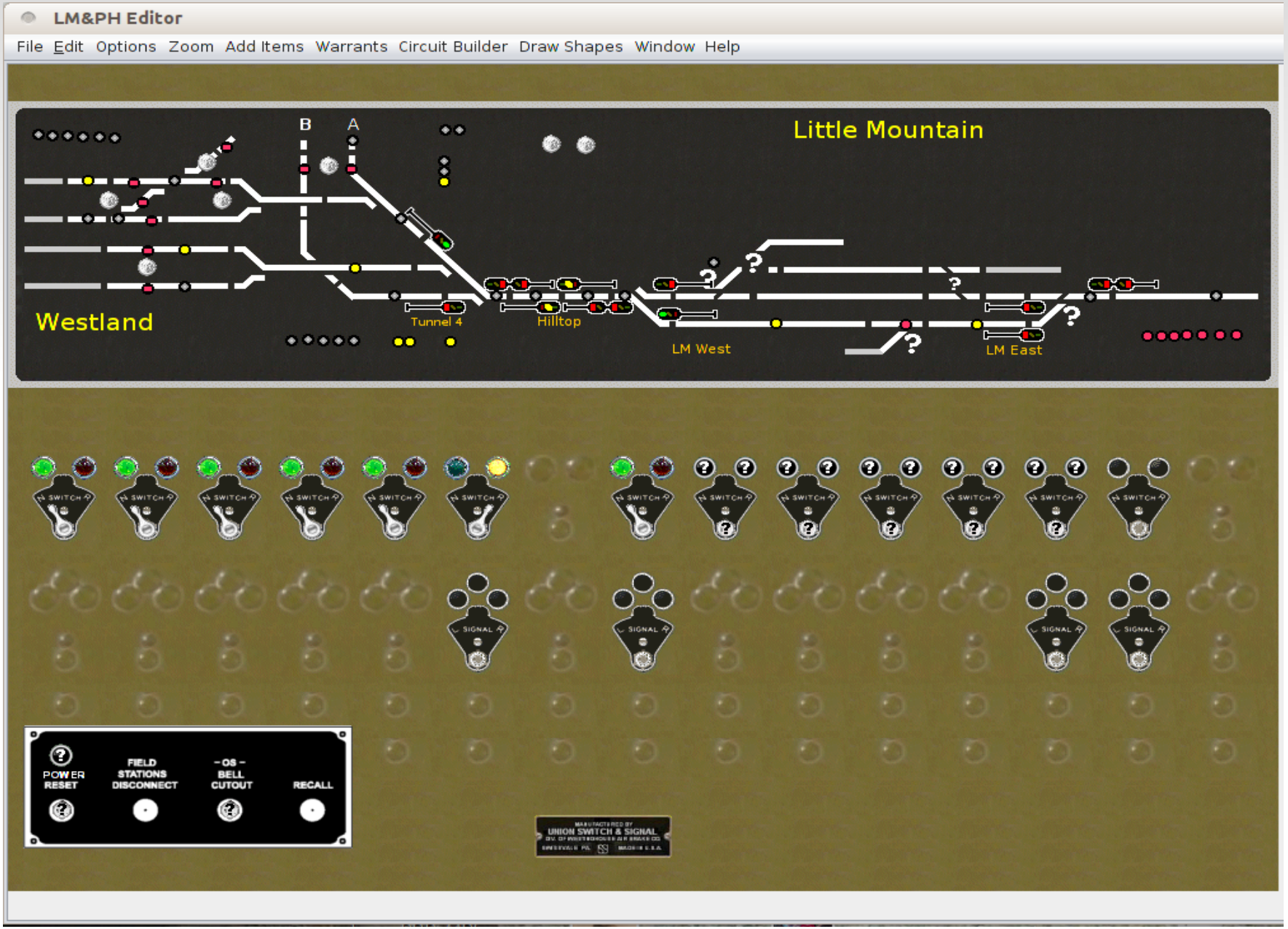


Layout Editor

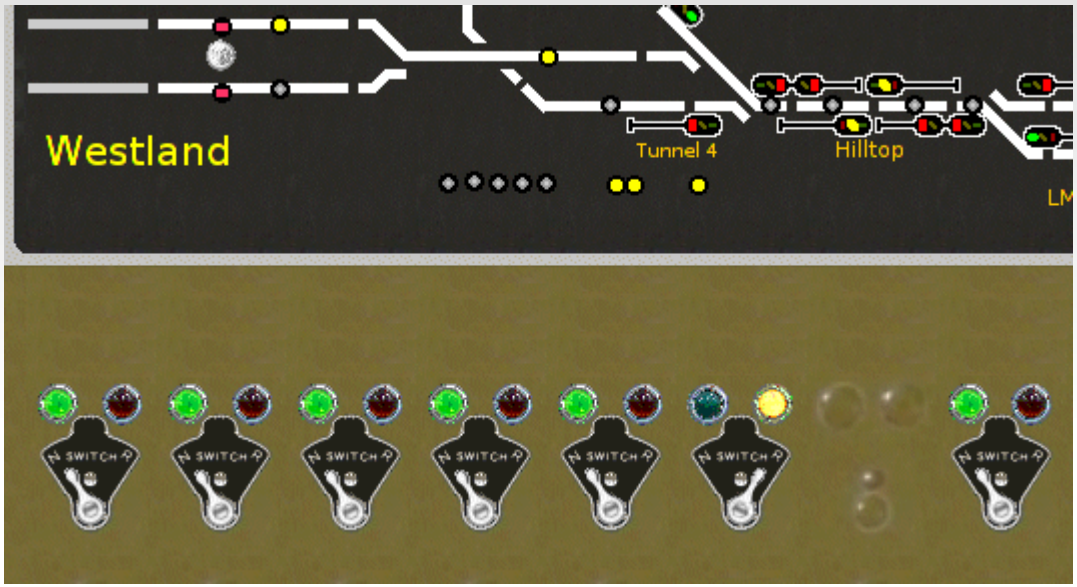


This image shows a Layout Editor panel in operation. Turnouts may be thrown by clicking on them. Red track is occupied, and white is clear.

Panel Editor



Panel Editor

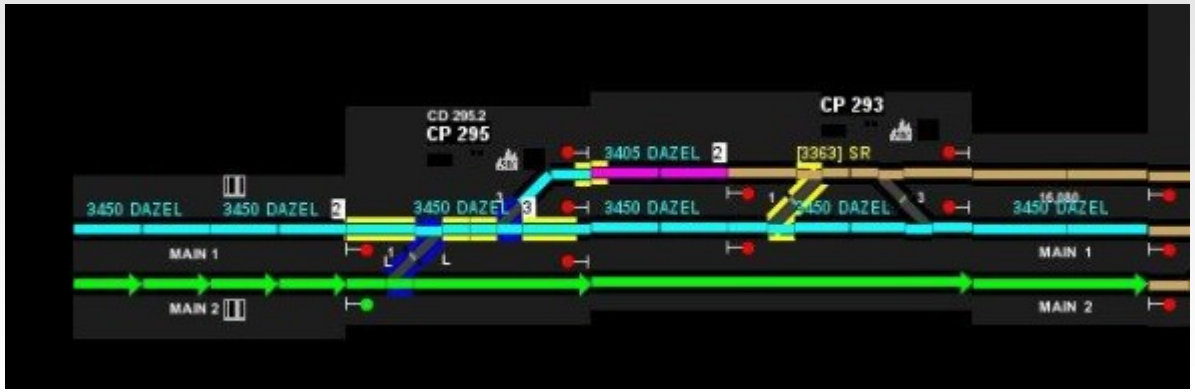


This image shows a Panel Editor panel in operation. Of course a classic CTC panel did not include working signal mast images. Turnouts may be thrown by clicking on them or by throwing the appropriate levers. (by clicking on the levers)

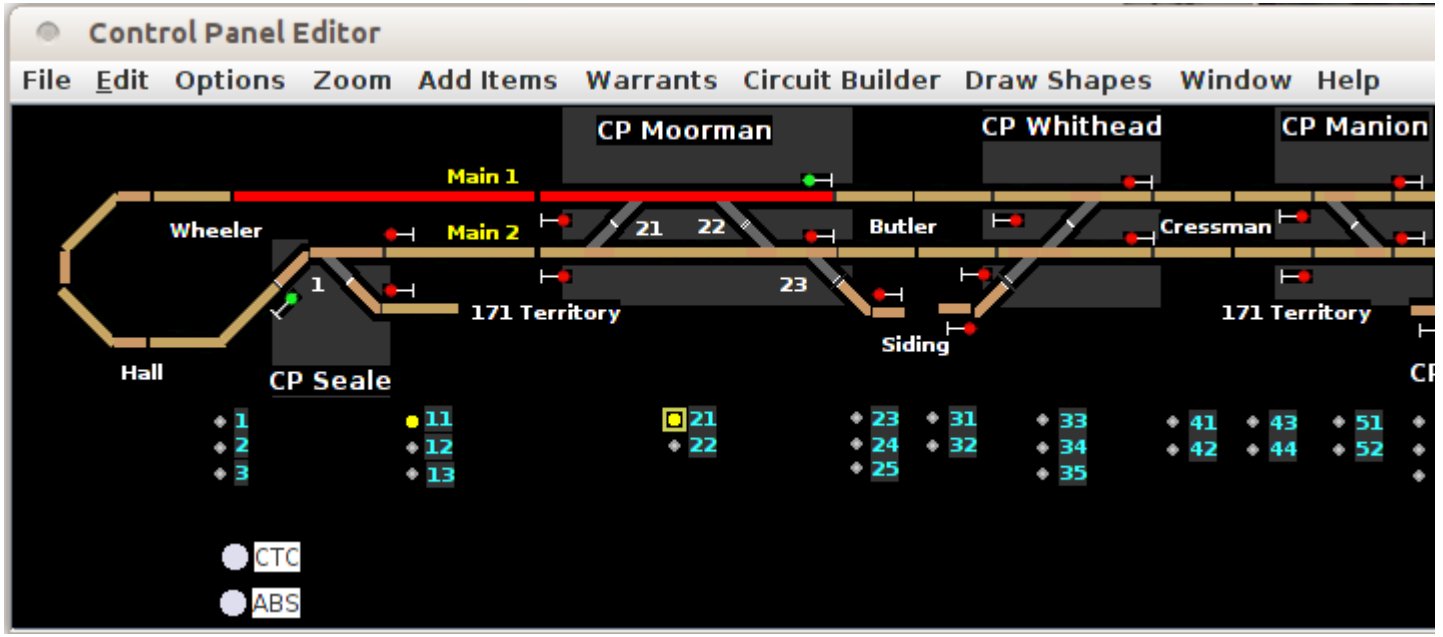
Track with yellow indicators is occupied. Unused sensors shown, but not placed.

Control Panel Editor

Prototype



Model



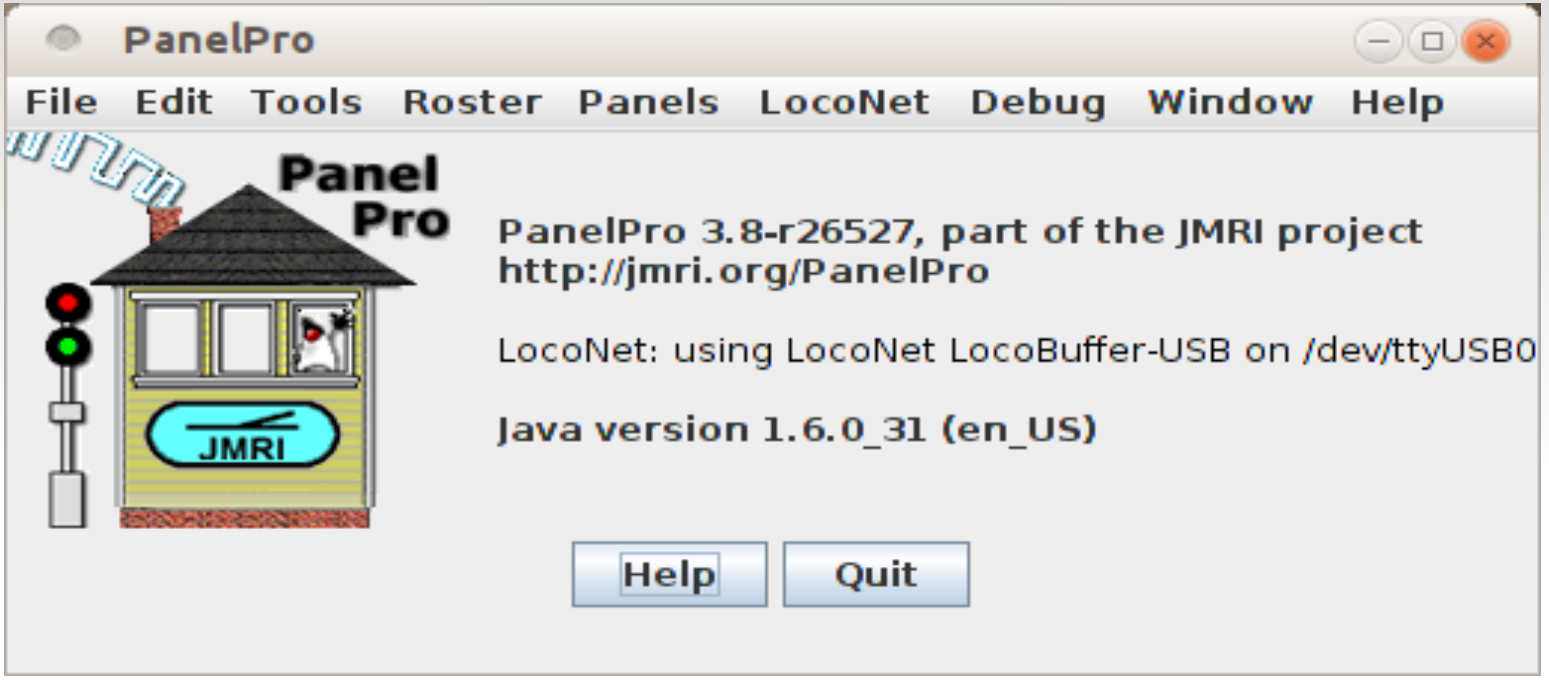
The Reality

- The Actual Signals at CP-293

The Reality

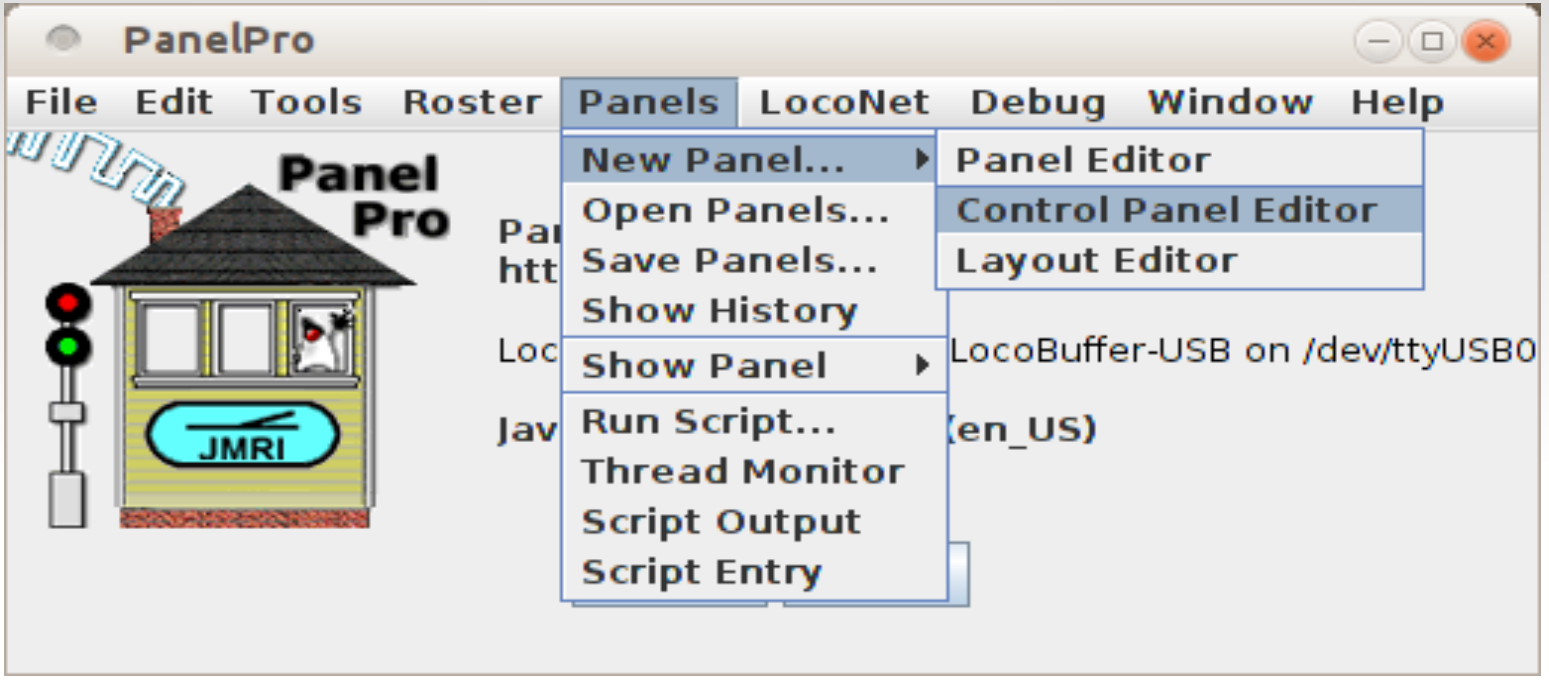
- The Dispatcher's view of CP-293 As far as I can tell from the information that I have, this train is westbound so we are probably looking at the middle set of signals that protect eastbound traffic. Note that the dispatcher has a very simplified view of the situation. The two crossovers are located under the train. The point motor is about where the trailing truck of the second engine is. The yellow 'Reminder Switch Tag' indication shows the location of switch heaters. Main 2 is on the right, Main 1 is center, and the track on the left is a controlled siding. The photo and the panel are at different times. The cyan track color indicates out of service. (track crew on siding, magenta)

Getting Started



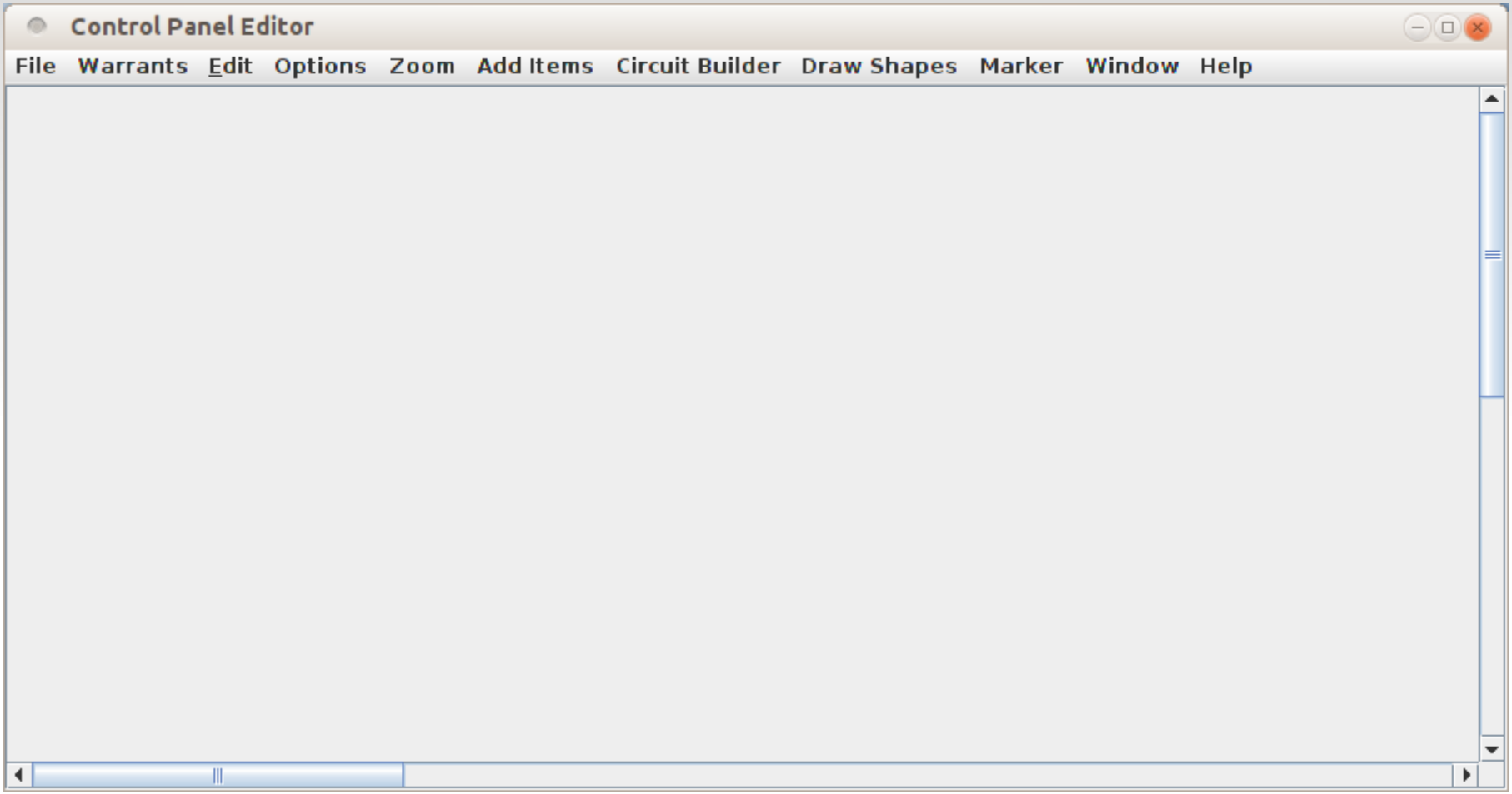
- Start JMRI by using the 'PanelPro' icon. Or on DP3 go to 'File' → 'Open PanelPro Window'.
- I am creating this clinic on a Linux machine. Your startup window may look slightly different. For example on Windows it would show a serial Com port number in the LocoBuffer-USB connection information line.

Getting Started



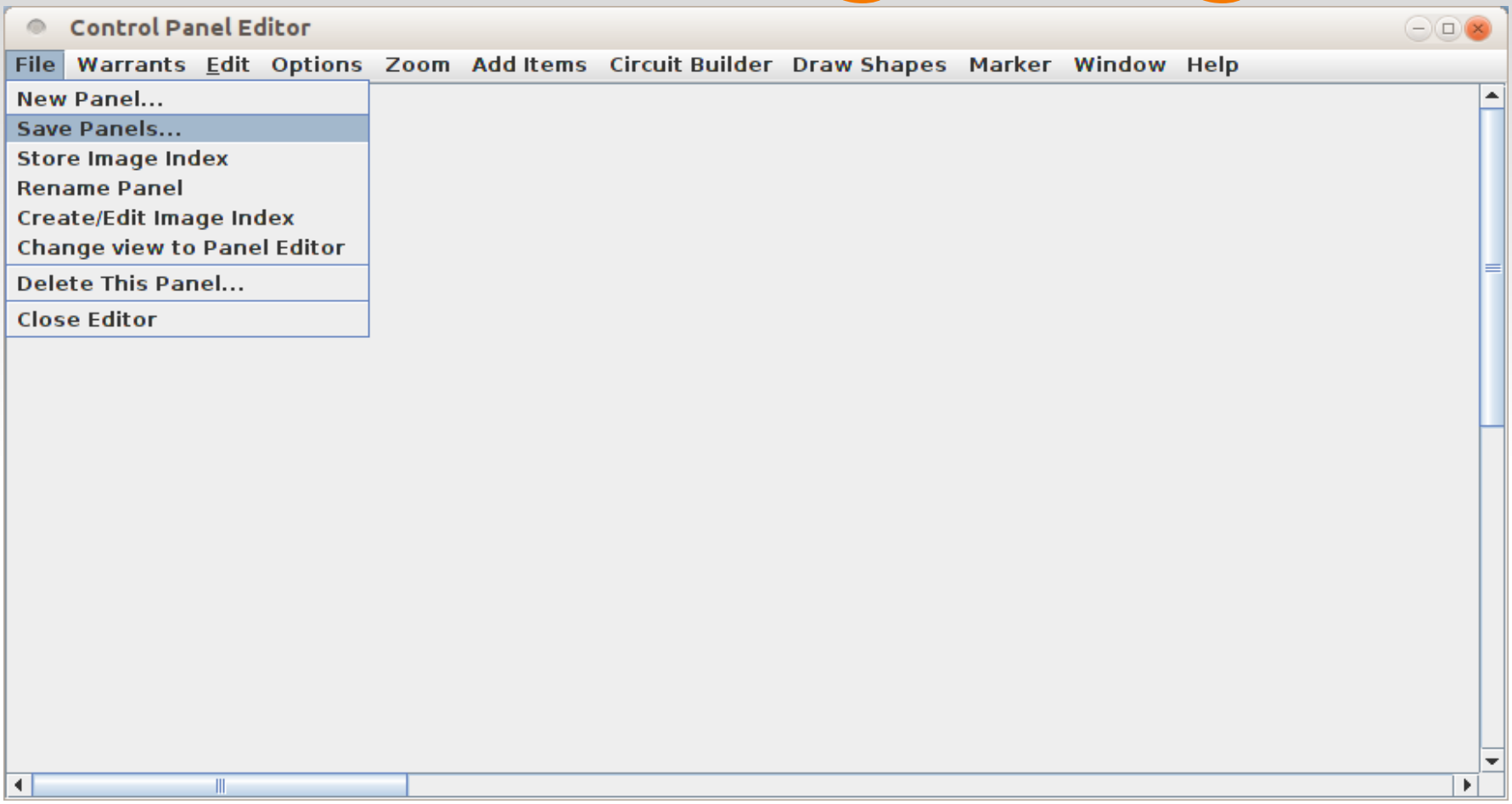
- In this clinic we will make the assumption that you are already some what familiar with JMRI and PanelPro. We are only going to cover the items that are unique to the Control Panel Editor.
- Under 'Panels' select 'New Panel' and then click on 'Control Panel Editor'.
- This will open a new Control Panel Editor window.

Getting Started



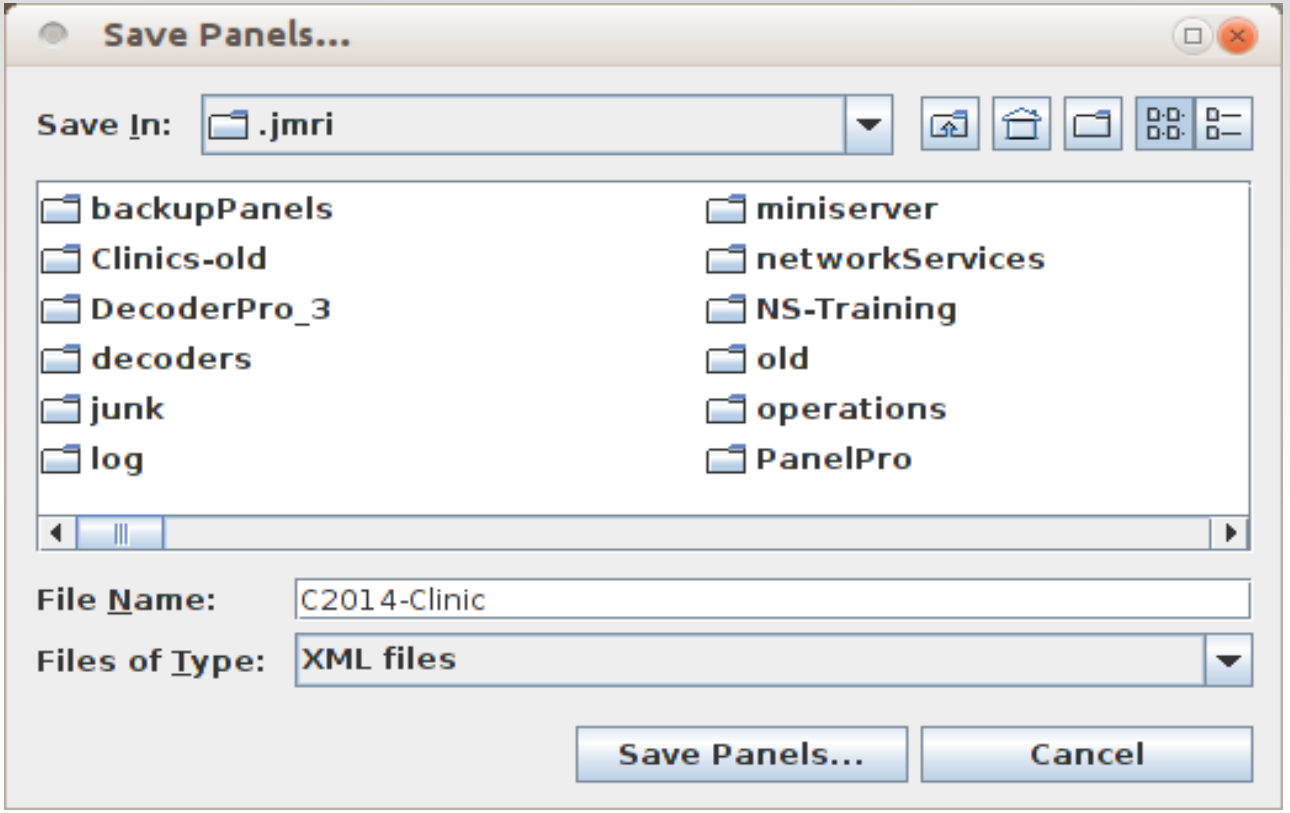
- All the Control Panel Editor functions are reached from the drop down menu bar.

The 'Saving' thing.



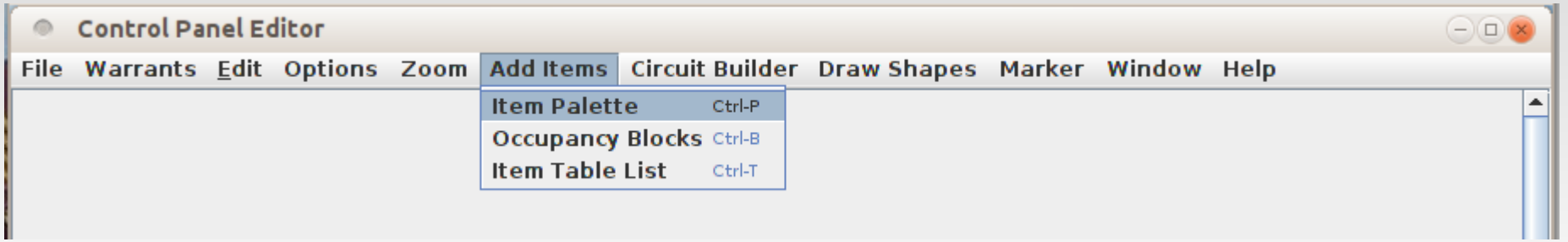
- First lets select 'Save Panels..' and give our panel a name.
- Note that it says 'Save **Panels**...', not 'Save Panel'. All loaded panels will be saved in a single 'Panel**s**' file. Also just closing a panel does NOT delete it. Think about the consequences of 'closing' then reloading a panel. Remember the Trouble with Tribbles?

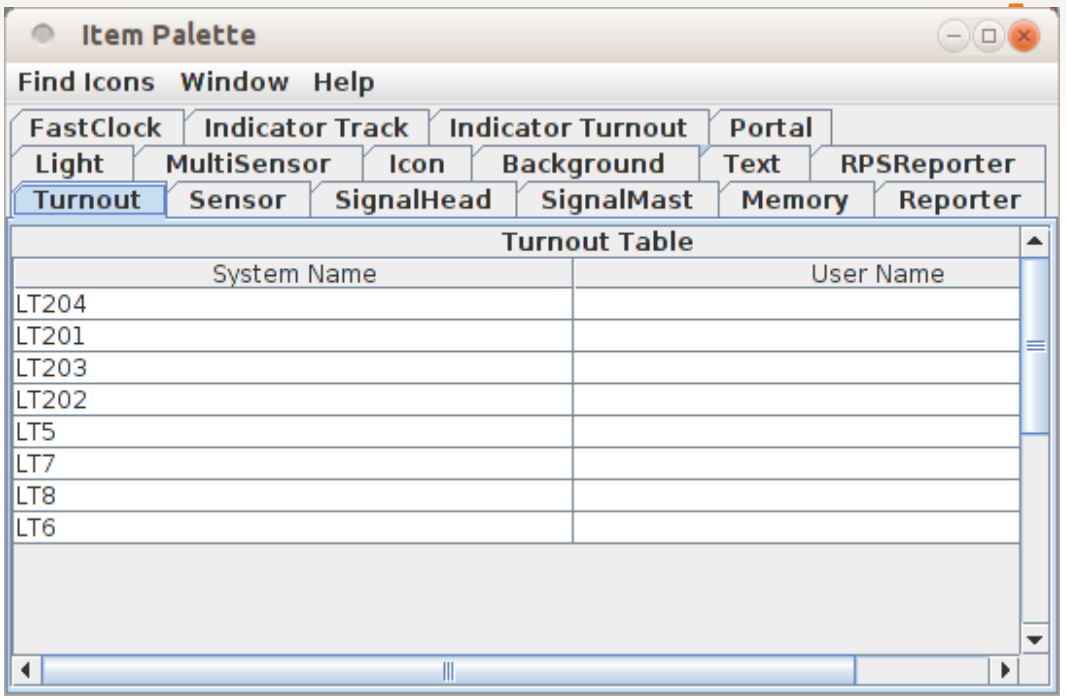
The 'Saving' thing.



- We will call it 'C2014-Clinic. The .xml extension will be added automatically.
- After you enter the new File Name, then click on the 'Save Panels...' button.
- I am using Linux, so your windows may look a bit different.
- Save your panels often, and change File Names in case you make a grave error.

Add Items



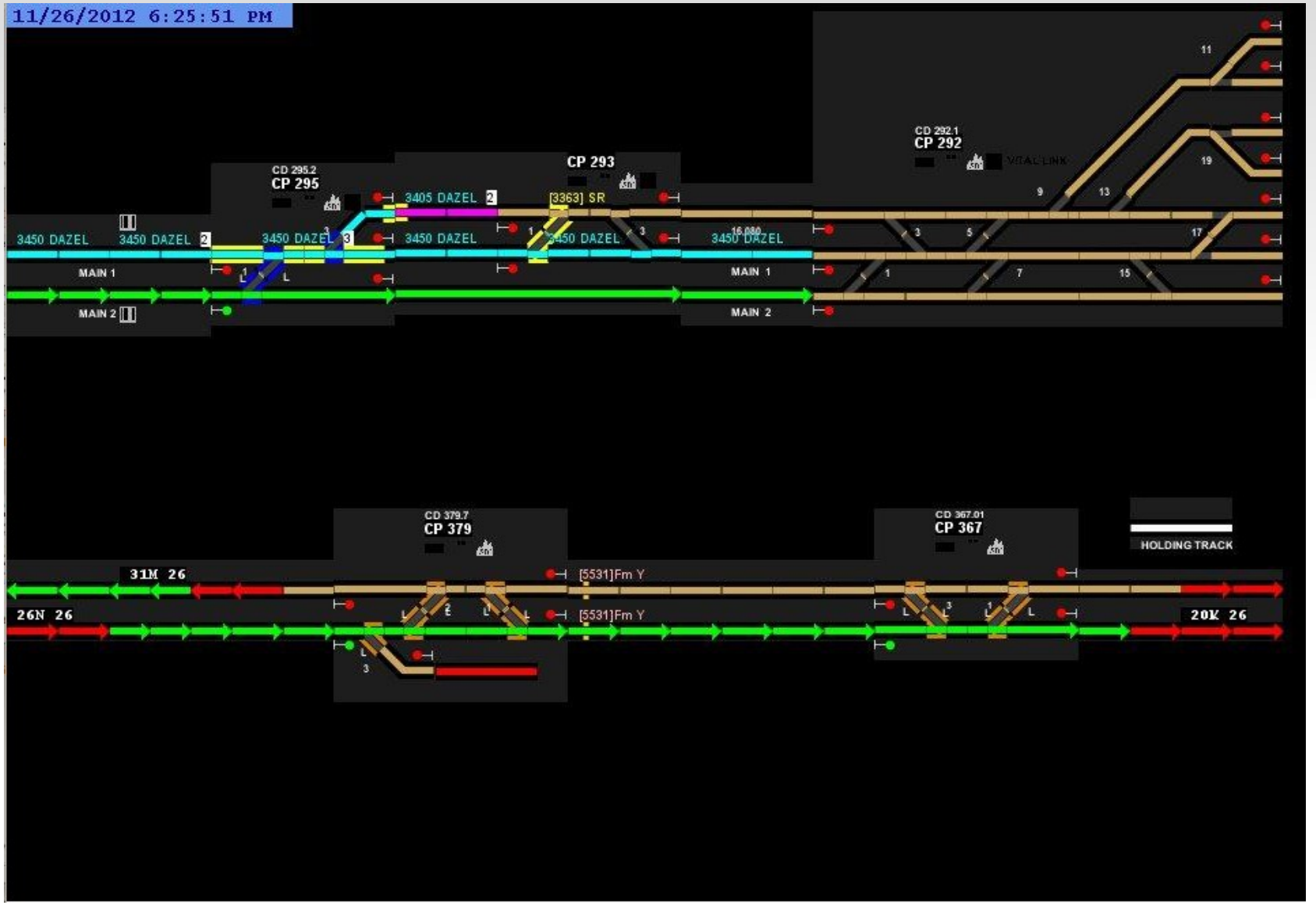


To add items to our new panel select 'Add Items' then click on 'Item Palette' or else select the panel and then type <Ctrl + P>

This opens a new 'Item Palette' window with various selection tabs for all the different kinds of things that we might want to add to our panel.

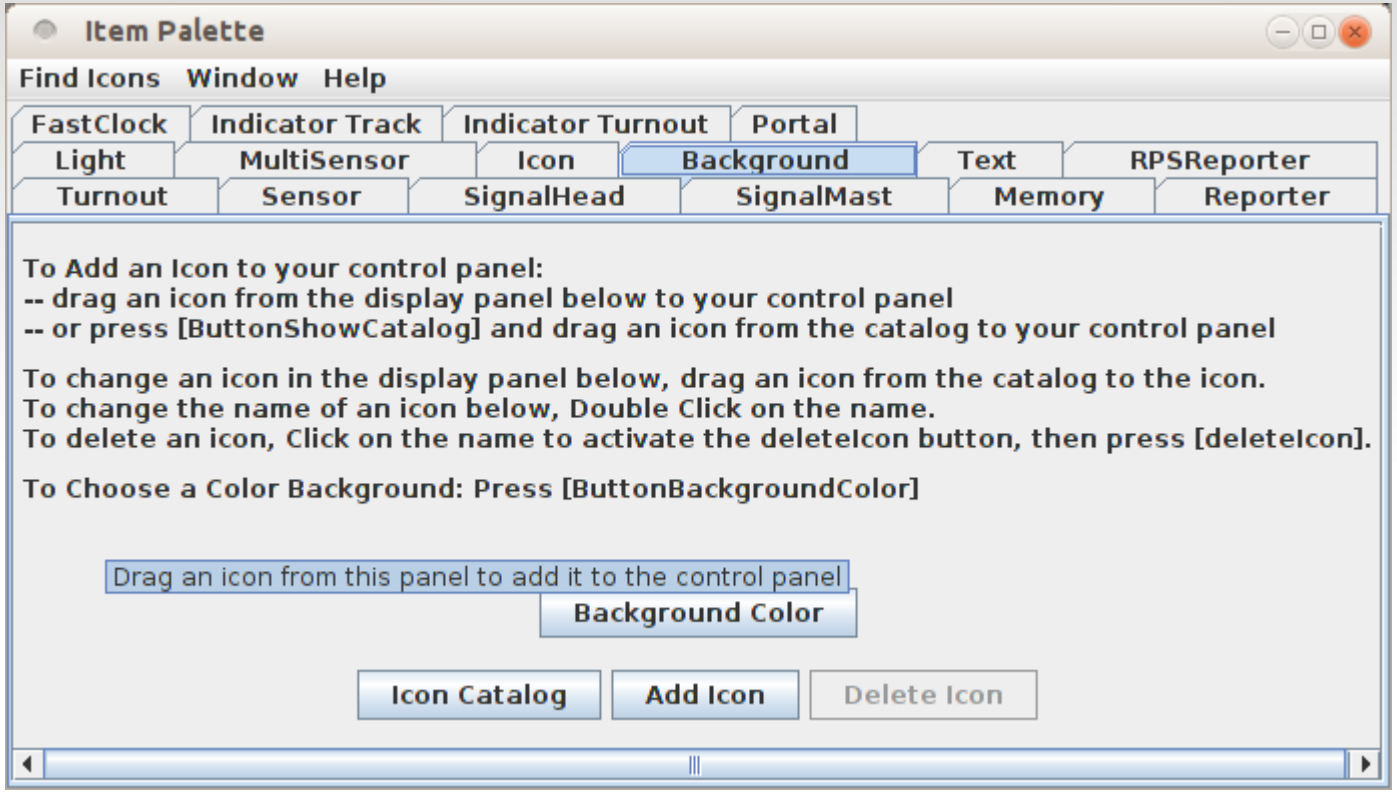
- Some tables may be automatically populated depending on the system used.

Add Items



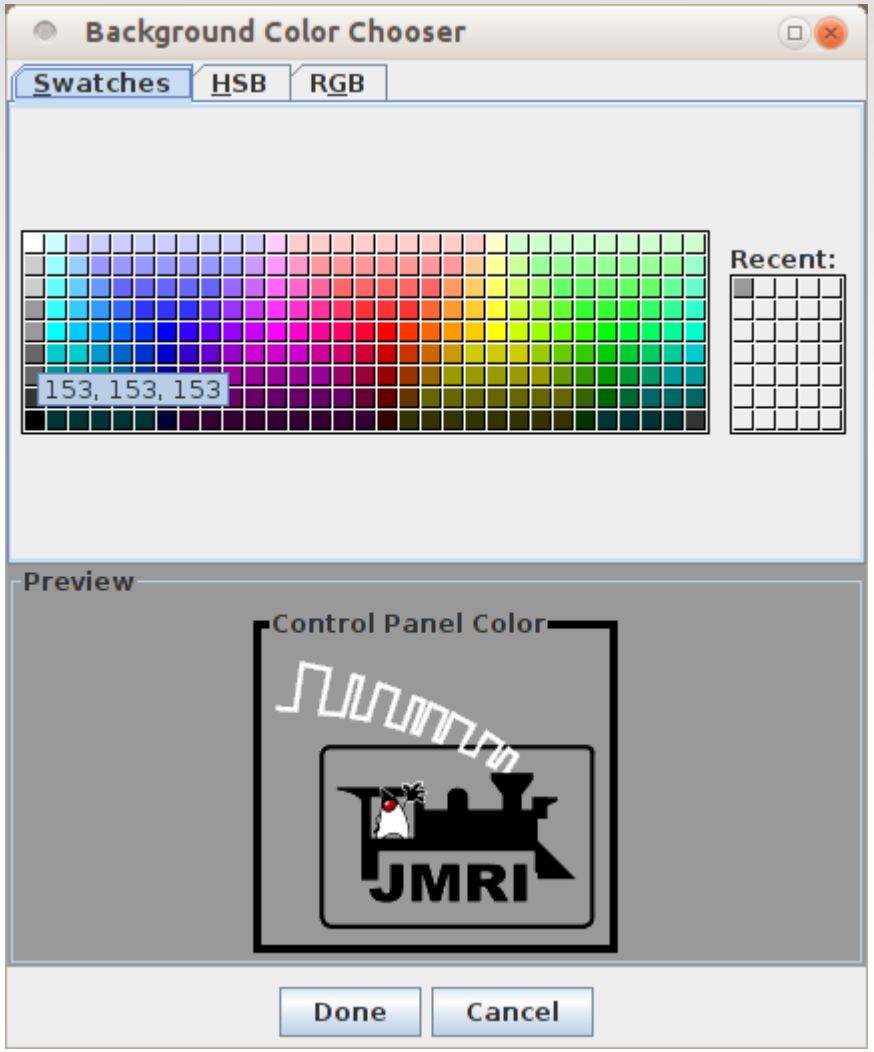
- This is the desired general appearance of our finished panel.

Add Items - Background



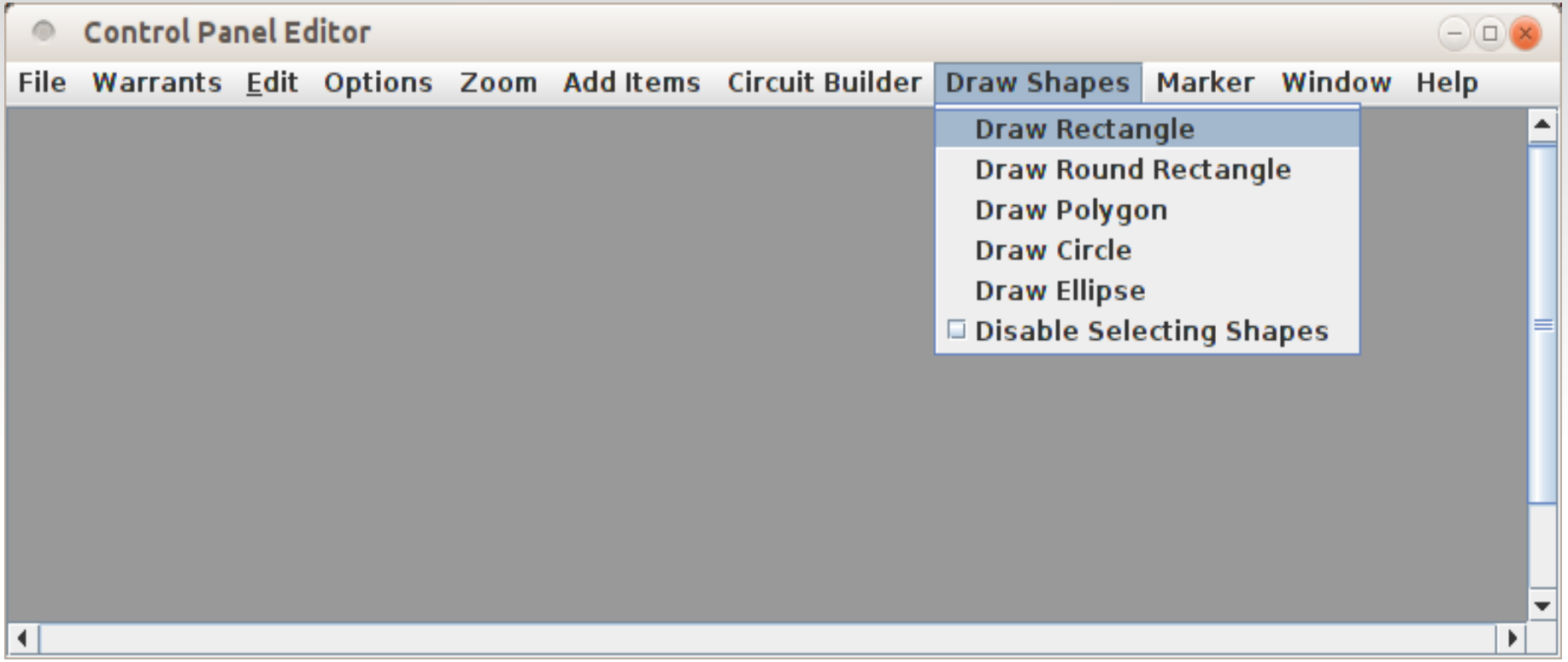
- You may either use existing or custom icons to build a background like a classic CTC panel, or simply select a single 'Background Color' like the basic black of the modern CRT panels.
- Click 'Background Color'.

Add Items - Background



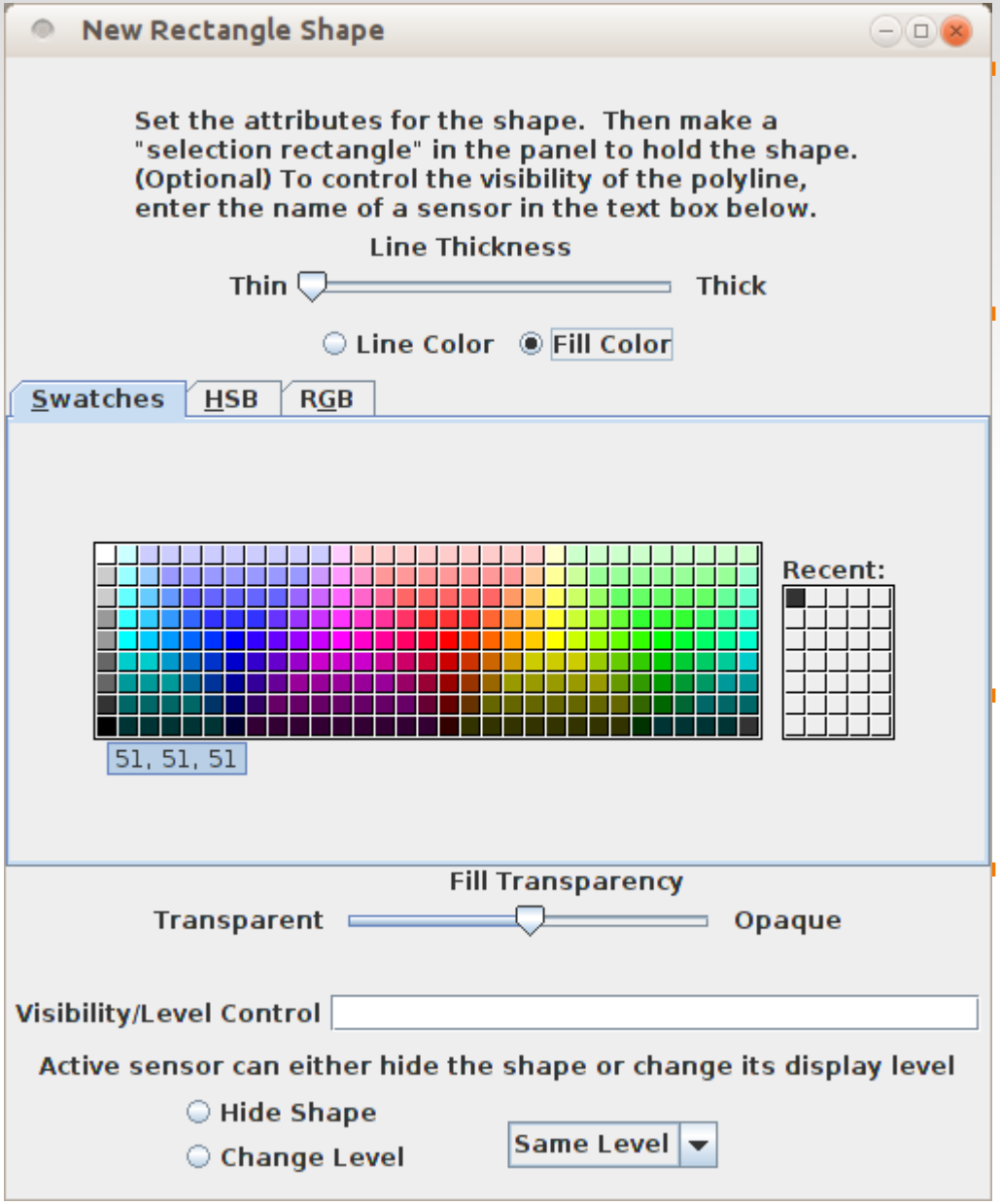
- Here we have selected Black from our pick list.
- Obviously that is not the only choice we have. Delay the mouse pointer over any item and it will show the RGB values for that color. (e.g. 0, 0, 0 for black)
- After the selection is made the new background color will be applied to the 'Preview' pane.
- Click 'Done' to apply the color to your panel. Solid black is difficult to see, so we will use a 153, 153, 153 medium grey until we are nearly finished.

Add Items - Shapes



- The Control Panel Editor includes the option of creating various shapes on the panel. We will use this feature to create the shaded boxes that highlight each of the Control Points on a modern panel.
- Select 'Draw Shapes' then click on 'Draw Rectangle'.

Add Items - Shapes



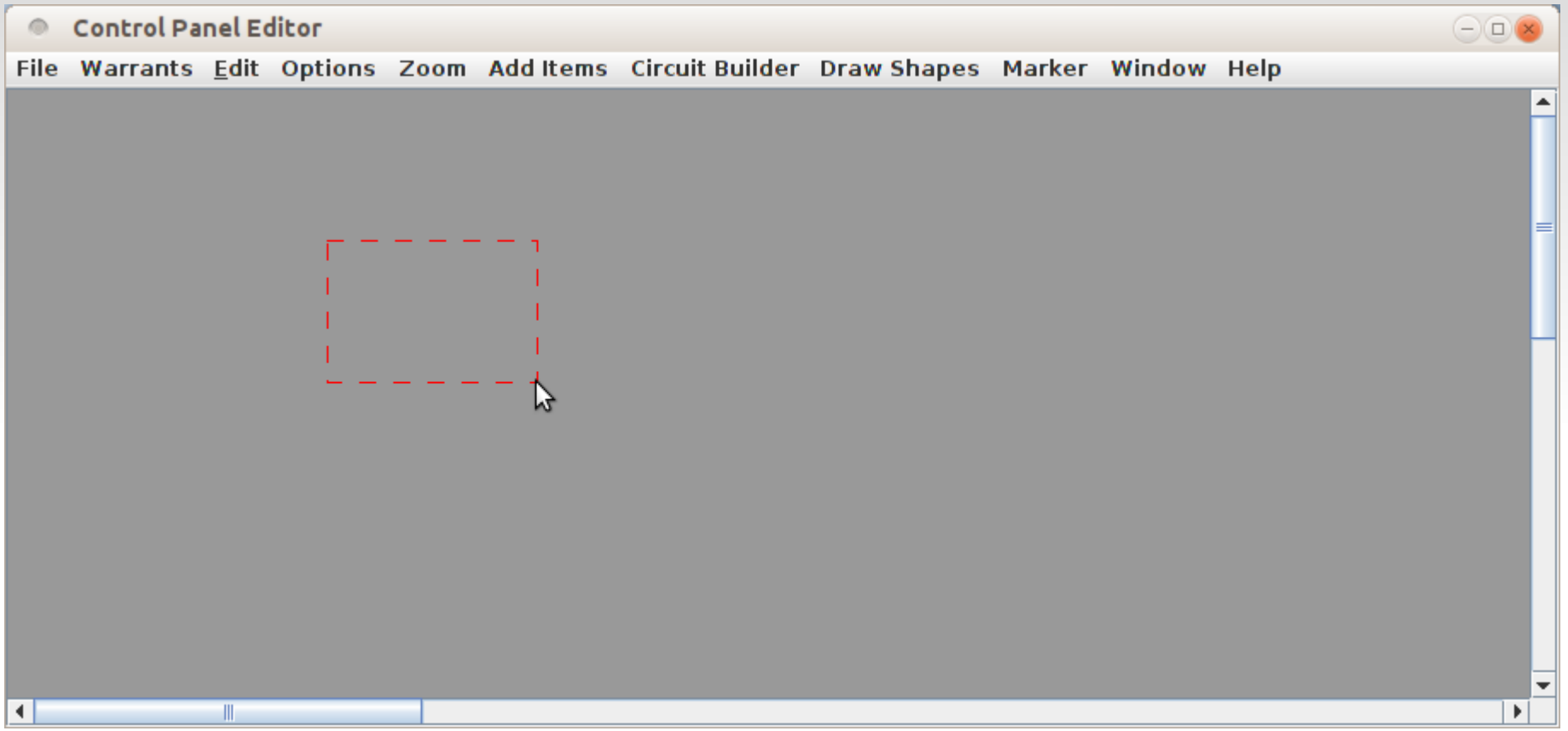
The 'New Rectangle Shape' window opens with various selection options.

Here we have selected our rectangle to have a fill color of dark gray. First select 'Fill Color' then click on the desired color.

You may choose one line color and a different fill color.

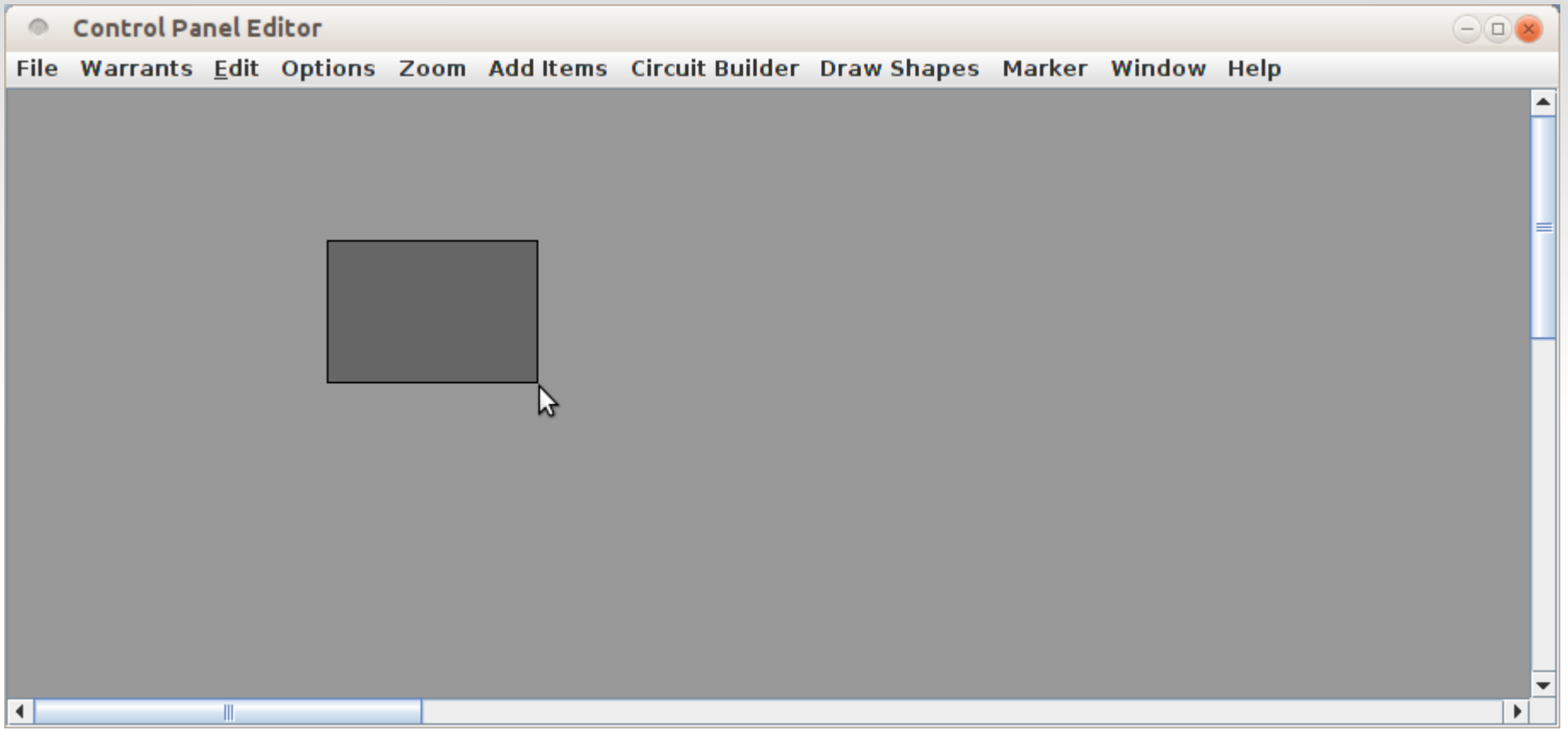
We would also select 'Opaque' to prevent any background image from showing through our rectangle image.

Add Items - Shapes



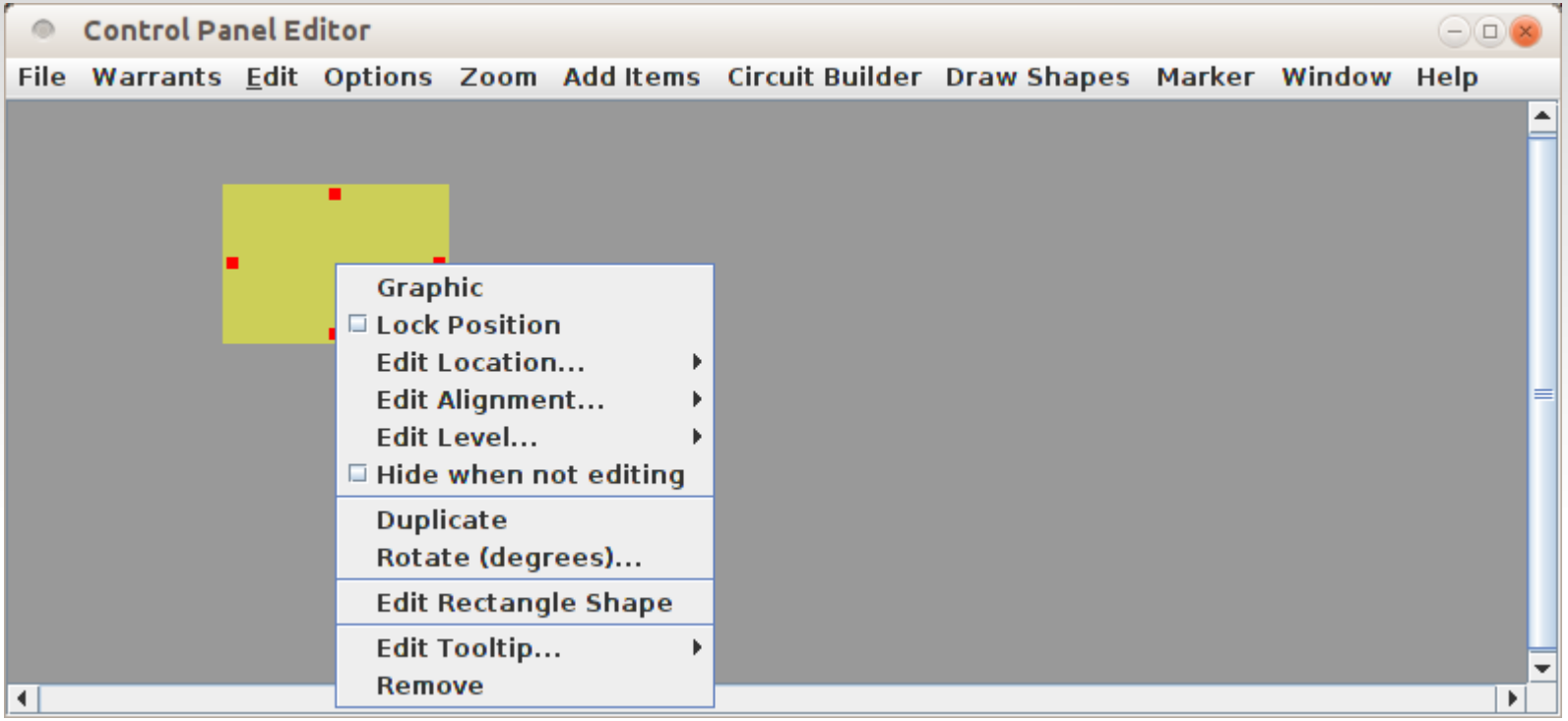
- Now use the mouse to select an area where the shape will be created.

Add Items - Shapes



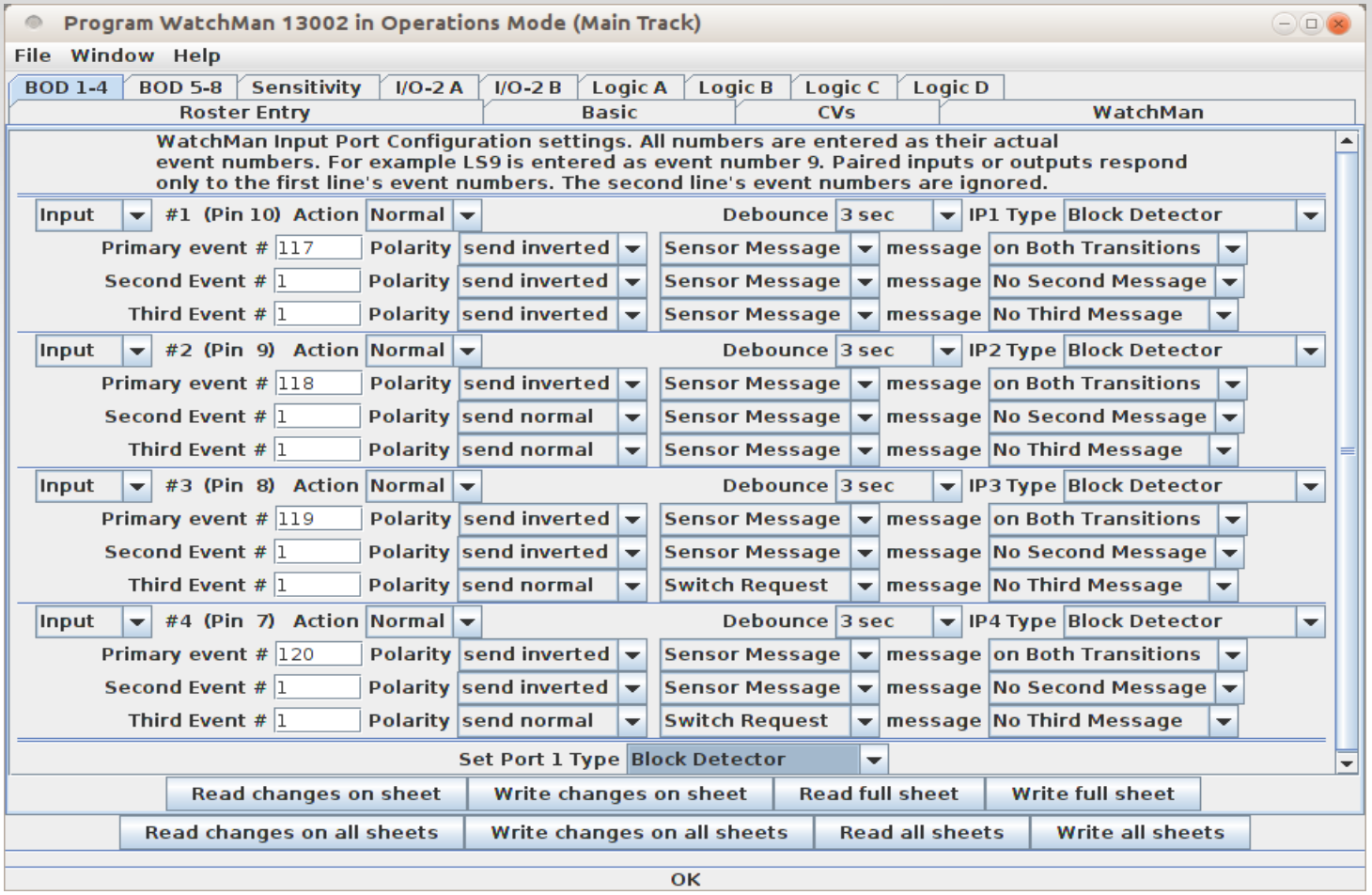
- Release the mouse to create your shape.
- To move your new shape first select it with a <Left Click>
- Once it is highlighted you may move it around with a <Left Click + Drag>

Add Items - Shapes



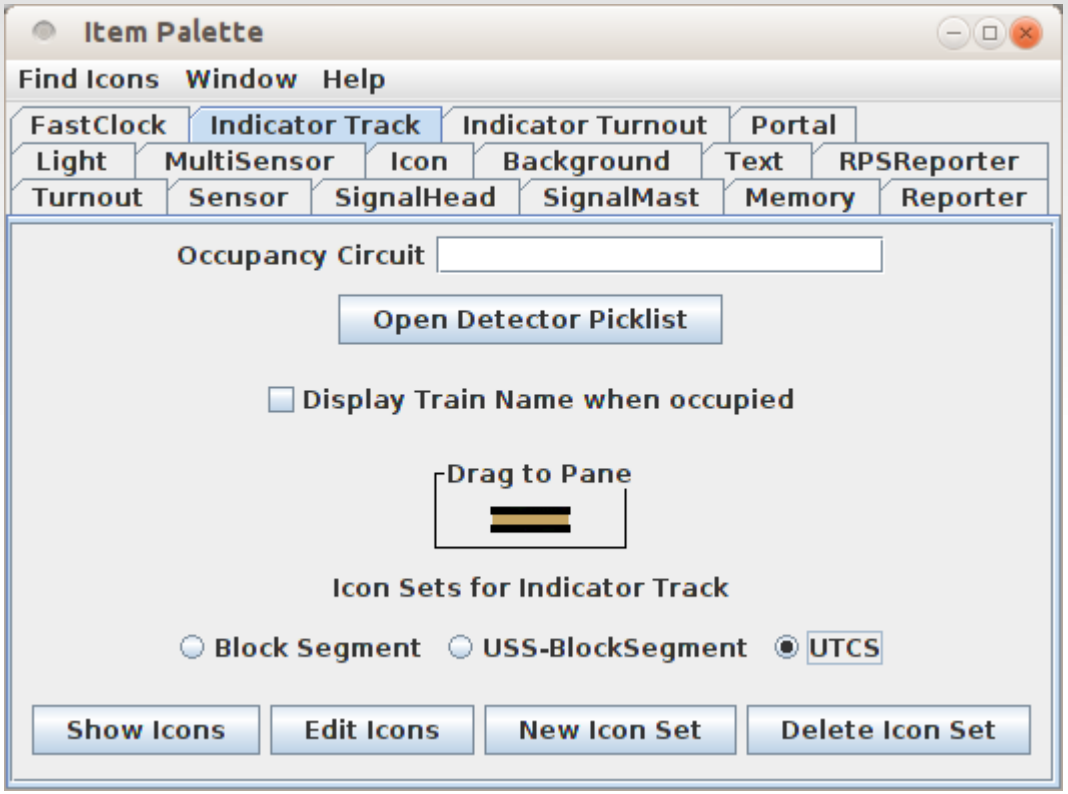
- Left Click in the rectangle to select it and Right Click to open its options.
- The 'Edit Rectangle Shape' option returns you to the selection window to make changes.
- 'Remove' is the nuclear option to let you start over.
- Use 'Edit Tooltip' to set a tool tip for the shape. For example 'CP 293'.

Add Items – Indicator Track



- Be sure to setup your system hardware as required for detection.
- The above example shows setting up a RR-CirKits WatchMan to monitor 4 of the demo layout blocks to send LocoNet events LS117-LS120. A 'Debounce' setting of 3 seconds simulates the prototype's relay delay.

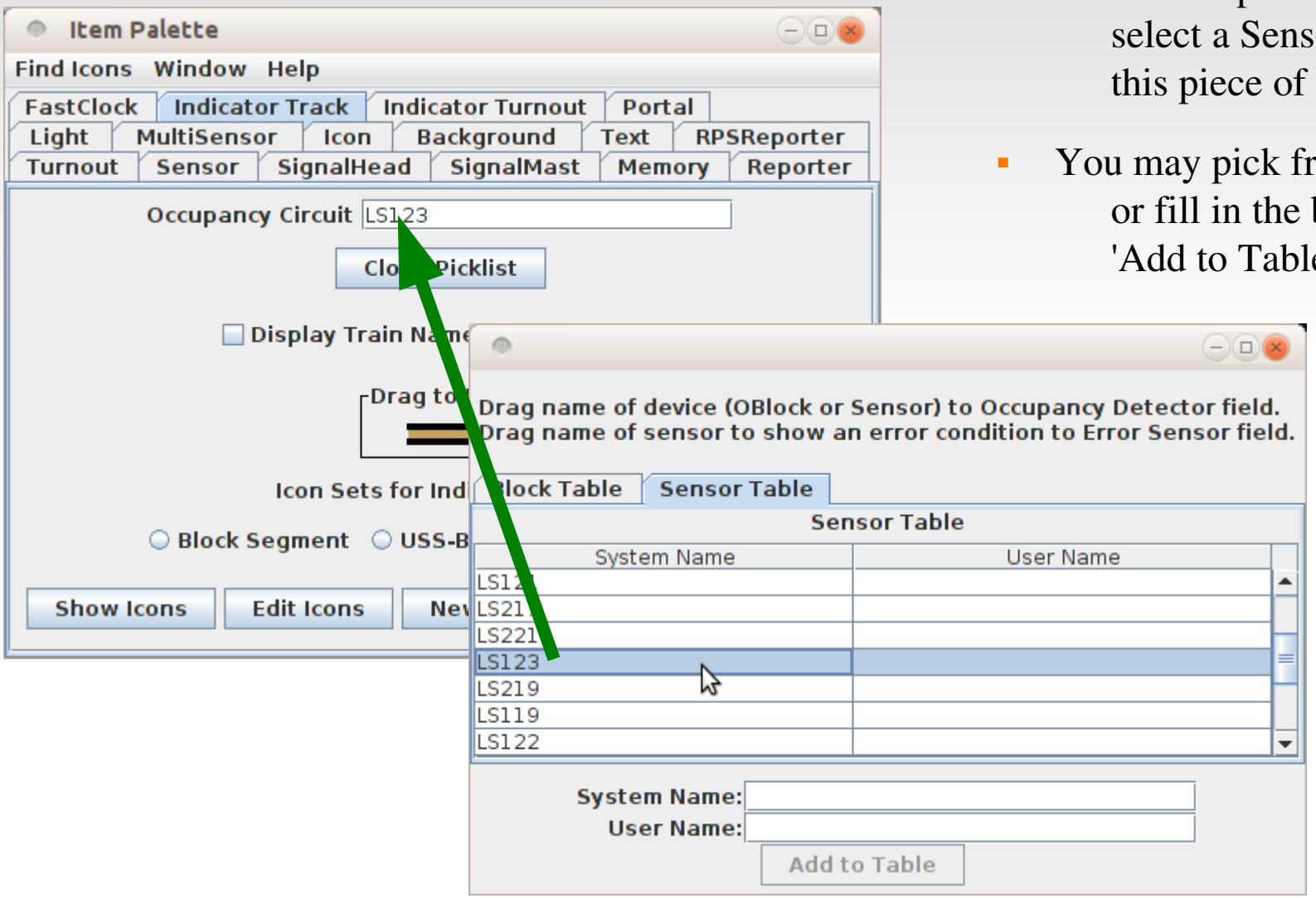
Add Items – Indicator Track



- Select the track type for the era you are modeling. In this example we have selected the current day UTCS images.
- To place track, drag the image to your panel.

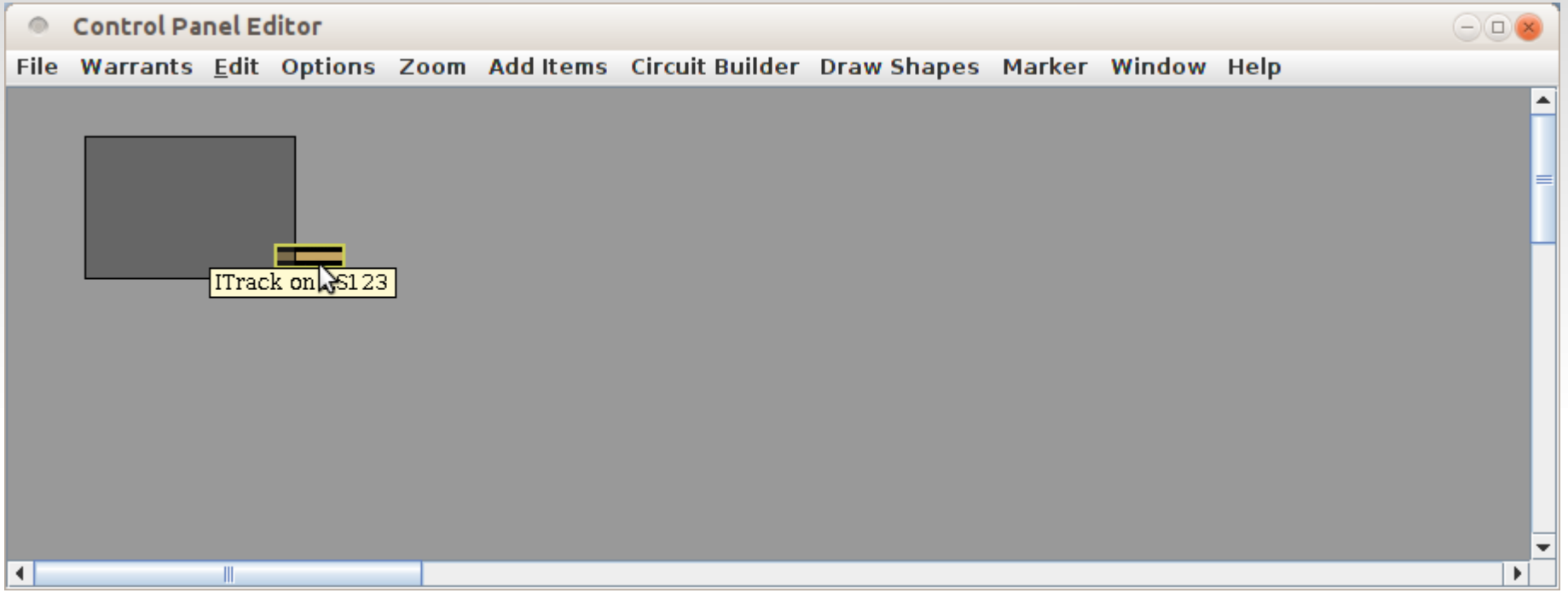
- Now lets add some track. In Panel Editor track is just static images taken from the icon set.
- Control Panel Editor expands on that option by adding six sets of active icons for track based on the track's status.
  - Power Error
  - Occupied
  - Clear
  - Out of Service
  - Allocated
  - Train Position
- UTCS = 'Unified Train Control System'

Add Items – Indicator Track



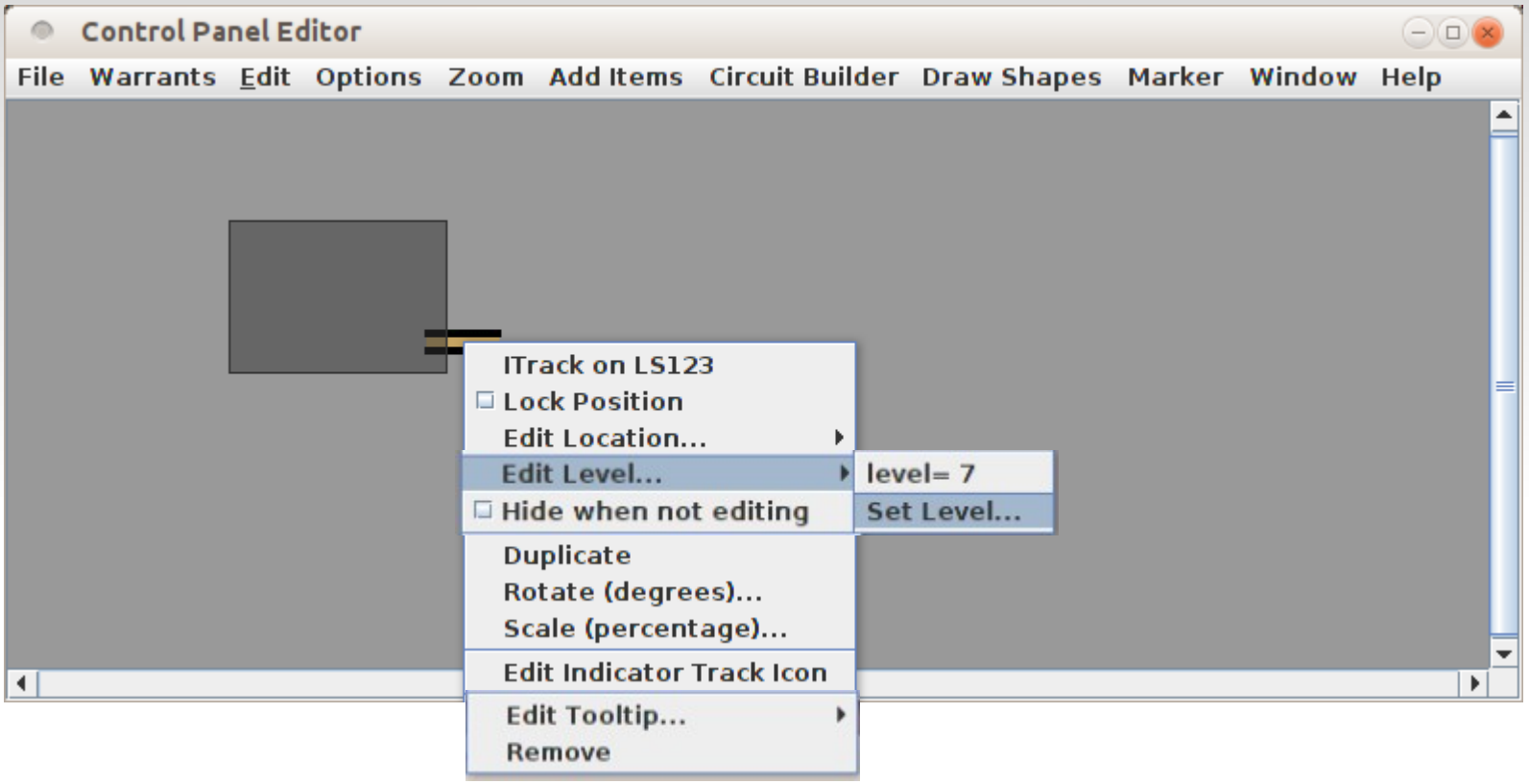
- Click on 'Open Detector Picklist' to select a Sensor or OBlock for this piece of track.
- You may pick from an existing list or fill in the blanks and click 'Add to Table'.
- Drag the sensor from the list into the 'Occupancy Circuit' box to connect the image to a sensor.

Add Items – Indicator Track



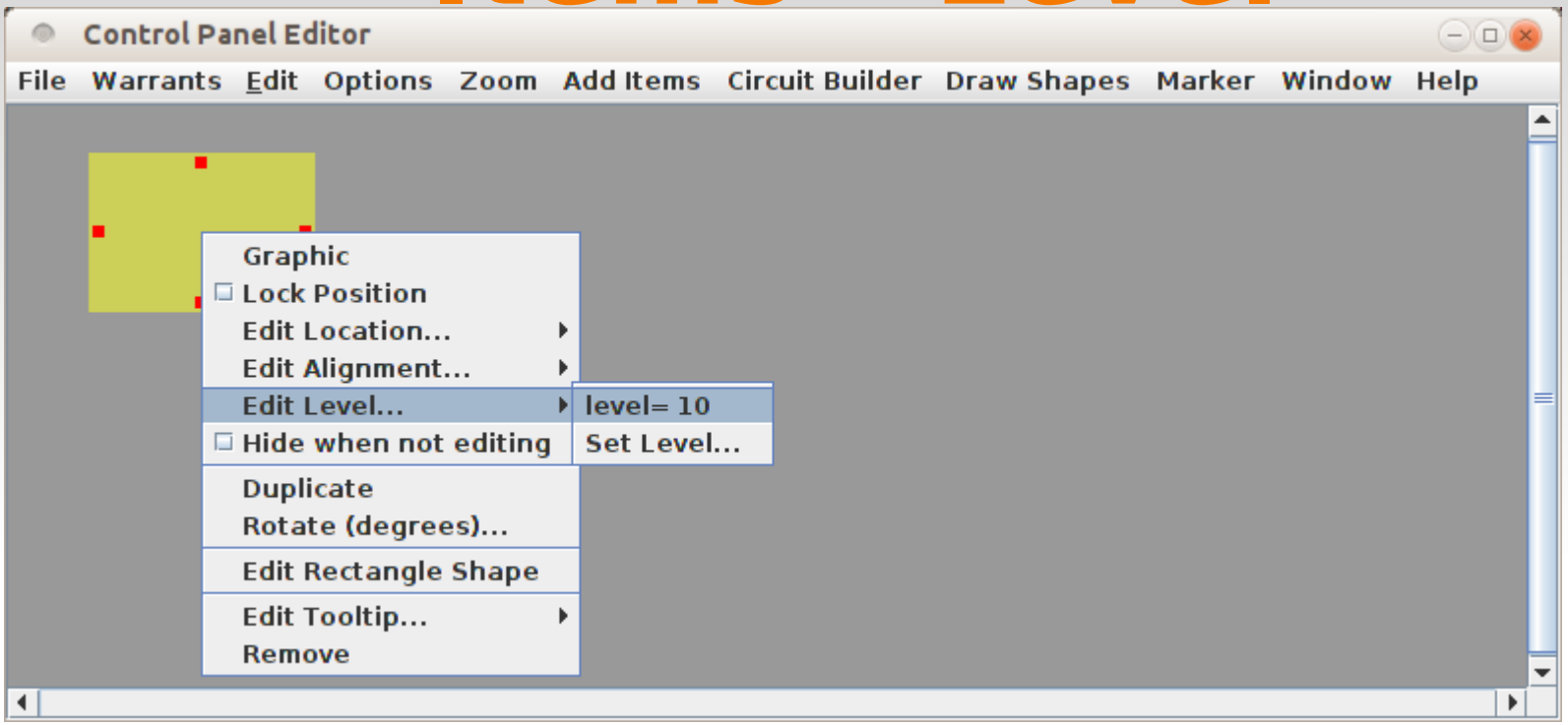
- To add track to the panel simply select it from the 'Drag to Pane' box and drag it onto the panel where it is needed.
- Note that part of the new track icon is hidden underneath the rectangle shape.

Items – Level



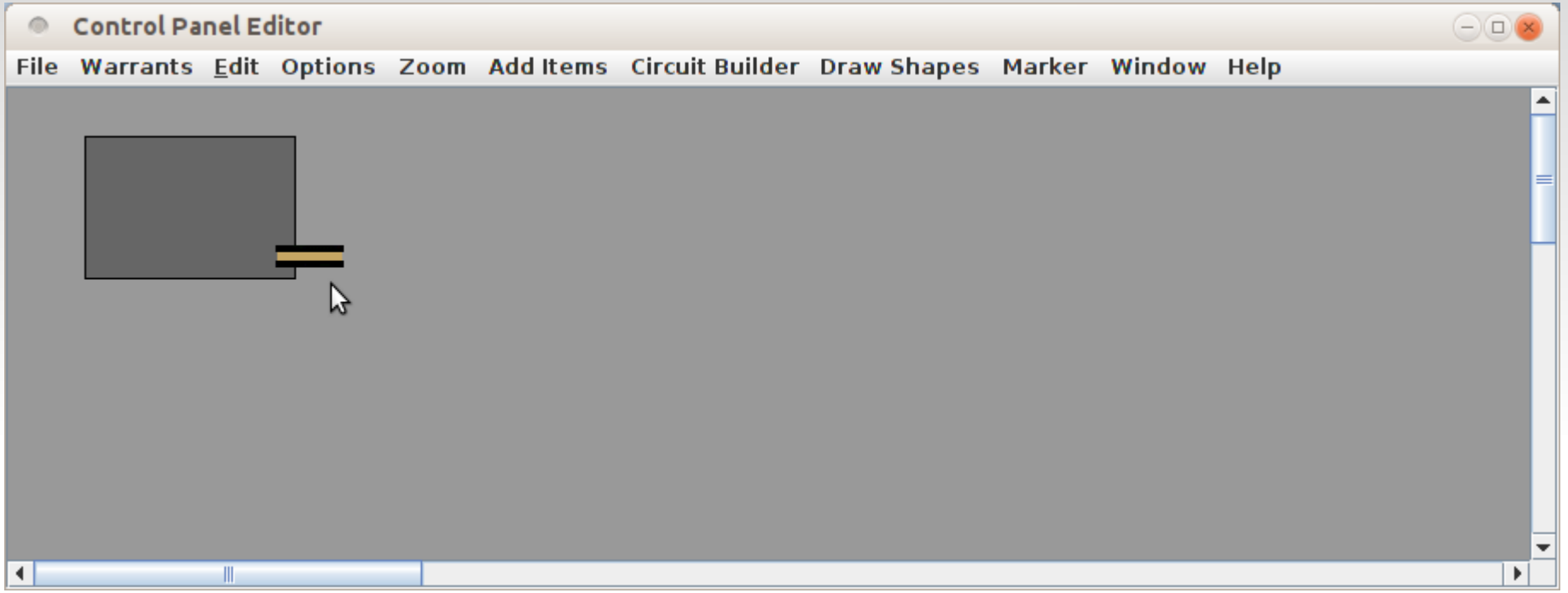
- This introduces us to a very key concept in how Control Panel Editor actually accomplishes its magic. The track is at level 7 and background is at level 10.
- Every object in the panel exists on a 'Level' or layer of the panel. Higher Level objects will cover over objects at a lower level unless they have 'Transparency' or pixels that are transparent. To correct this we need to set the background to a level under the track.

Items – Level



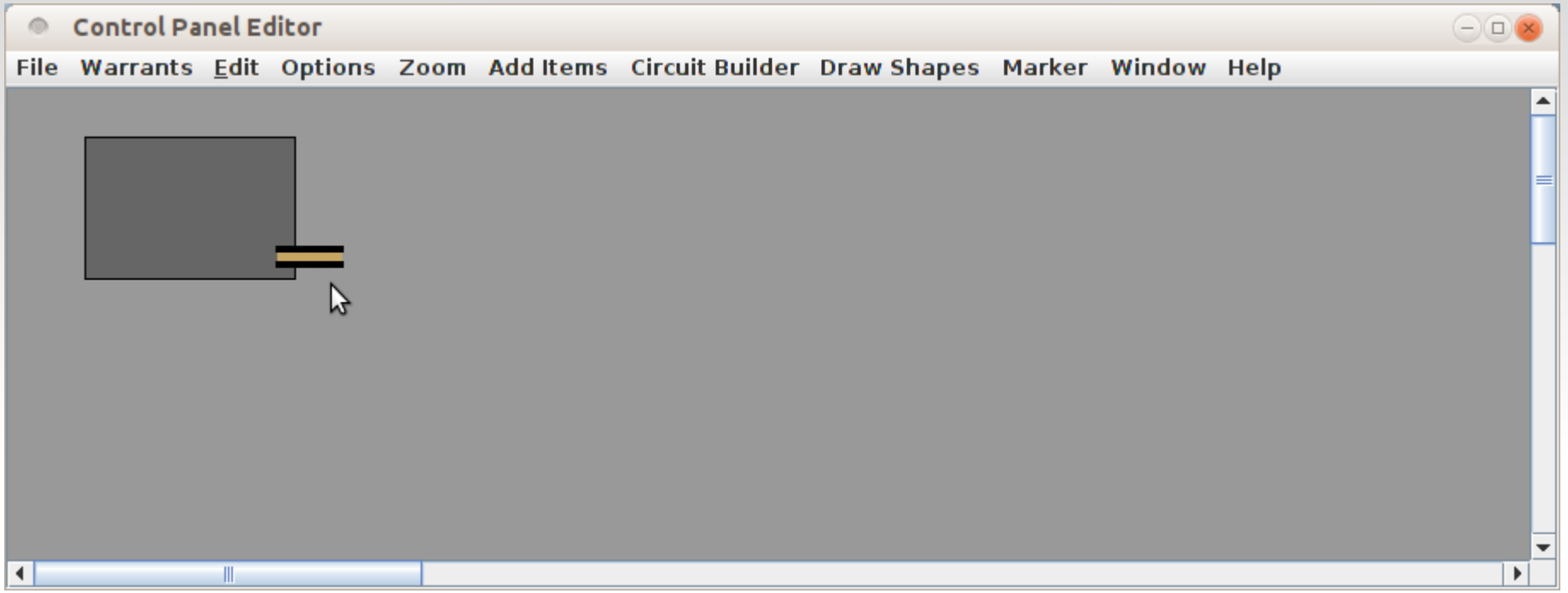
- To access the Shape 'Level' information requires a <Right Click> to access the menu. (<Shift + Right Click> in some older versions of JMRI)
- We see from this that the Indicator Rectangle Shape defaults to Level= 10 which is a higher level than the track, which explains why the track is hidden by it.
- Once we see the problem the solution is simple. We want everything to be on top of the background which is at Level=1. Our gray Rectangle Shape which is placed under all other icons should be set to Level=2. Note: do NOT set it to Level=1 or you will no longer be able to access it. (don't ask) Fortunately I do know how to edit the .xml files.

Items – Level



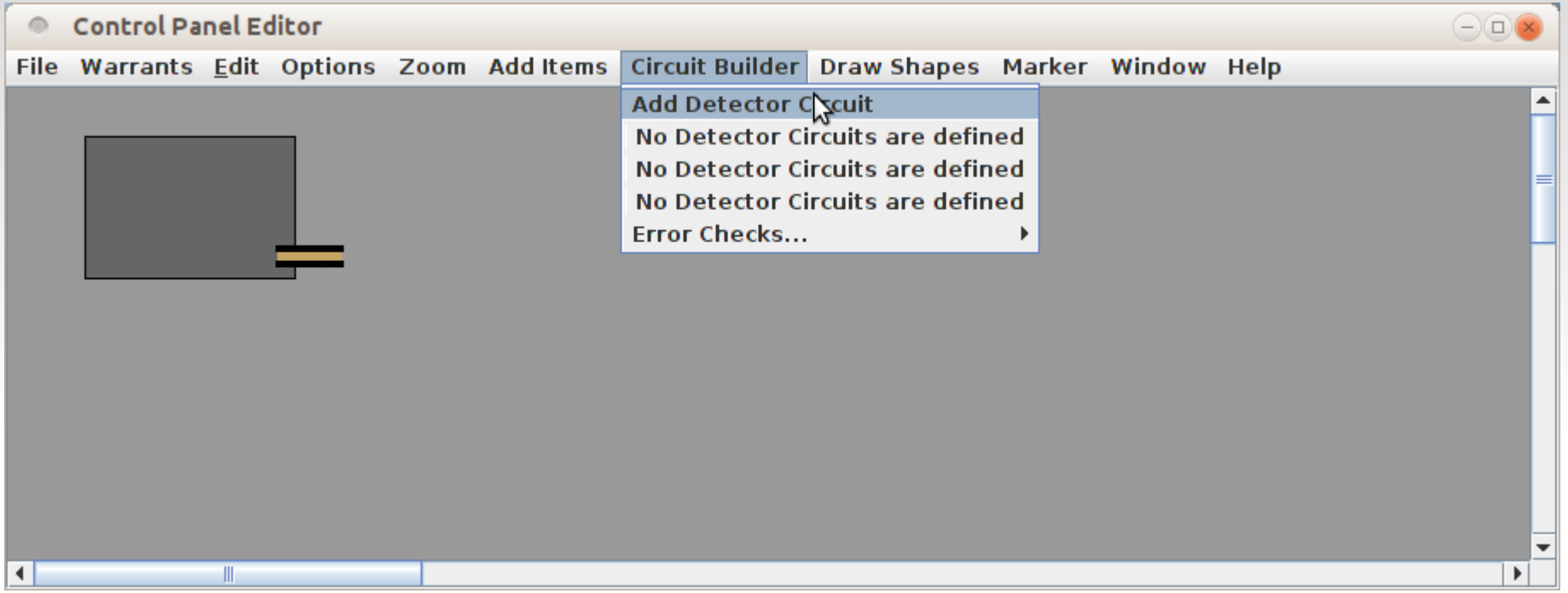
- Now that we have changed the Level of the Rectangle Shape to Level=2 our track is showing on top of it.
- This same Level setting trick can be used for other places as well. For example Indicator Track and Indicator Turnouts both default to Level=7. However sometimes we would like to position a turnout image on top of a track image. If they are both at Level=7 then it is random which image will be visible. If we change the Indicator Track to Level=6, then the turnout will always show up on top of the track.

Items – Occupancy Block



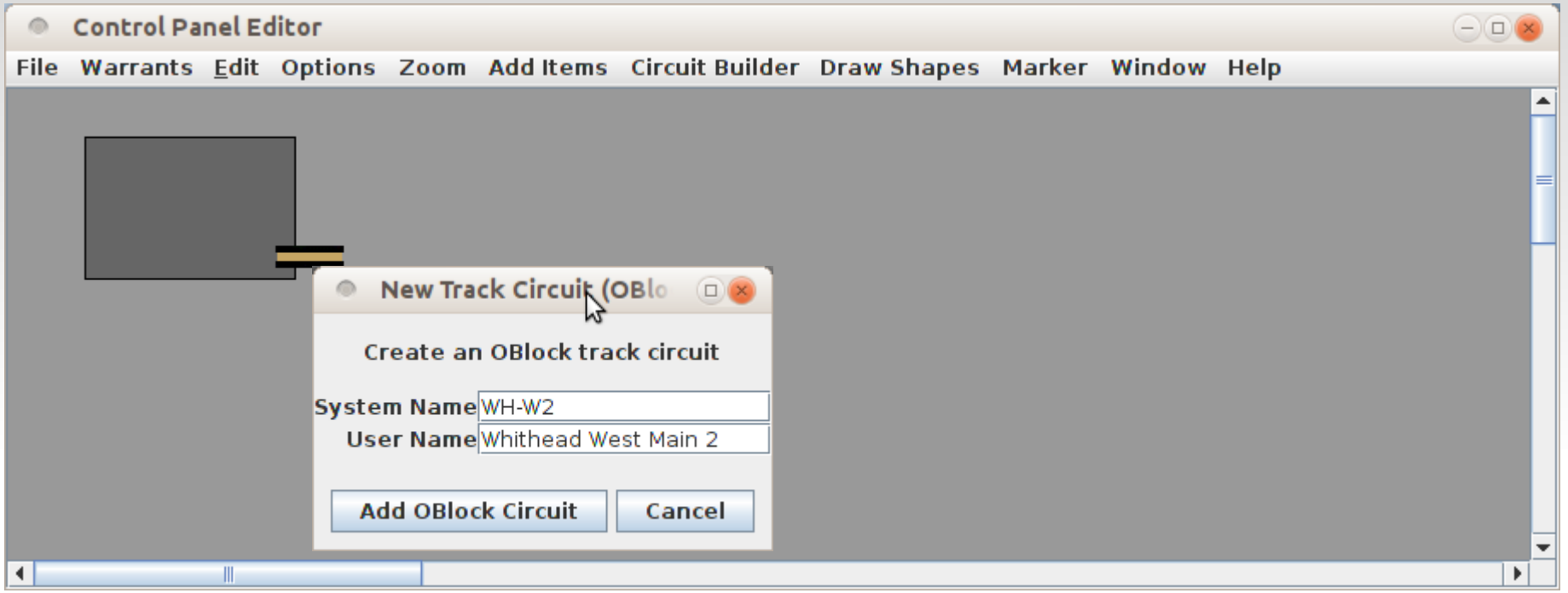
- Now lets add a track circuit for this set of icons. When we first added the Indicator Track we simply assigned it to a sensor. However we can actually define a complete track circuit for later use.

Items – Occupancy Block



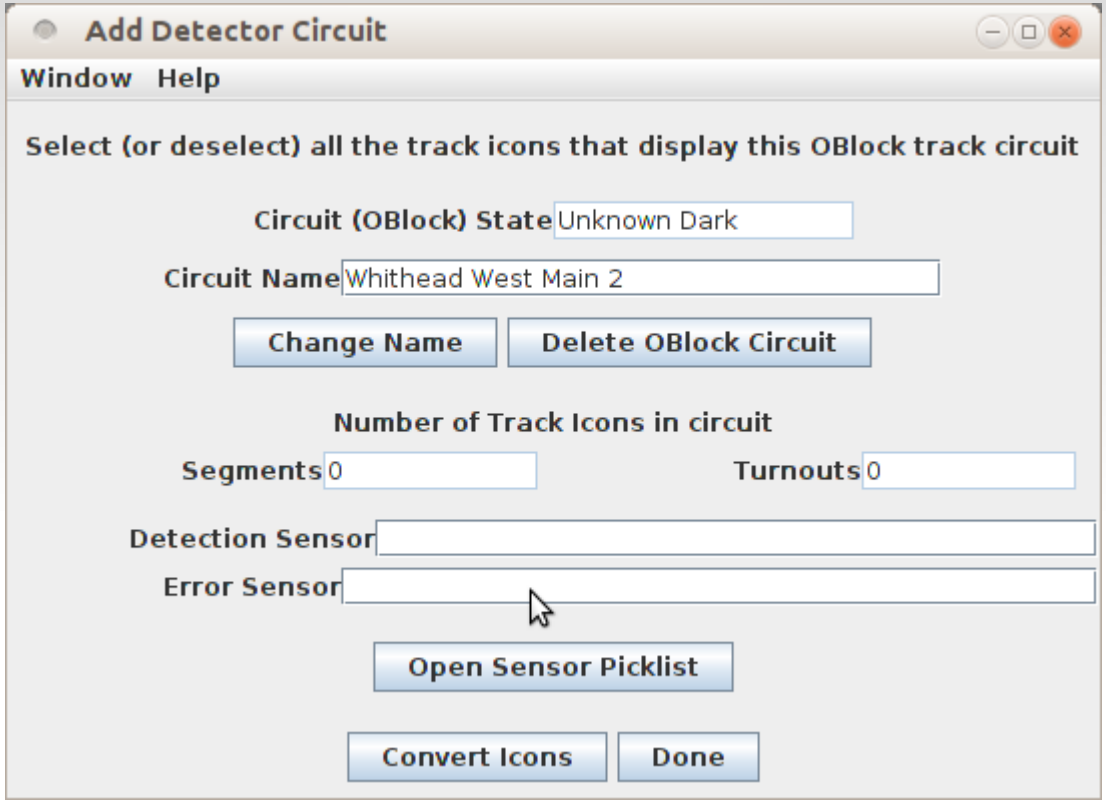
- Now lets add a track circuit for this set of icons. When we first added the Indicator Track we simply assigned it to a sensor. However we can actually define a complete track circuit for later use.
- Select the Circuit Builder drop down and click on 'Add Detector Circuit'

Items – Occupancy Block



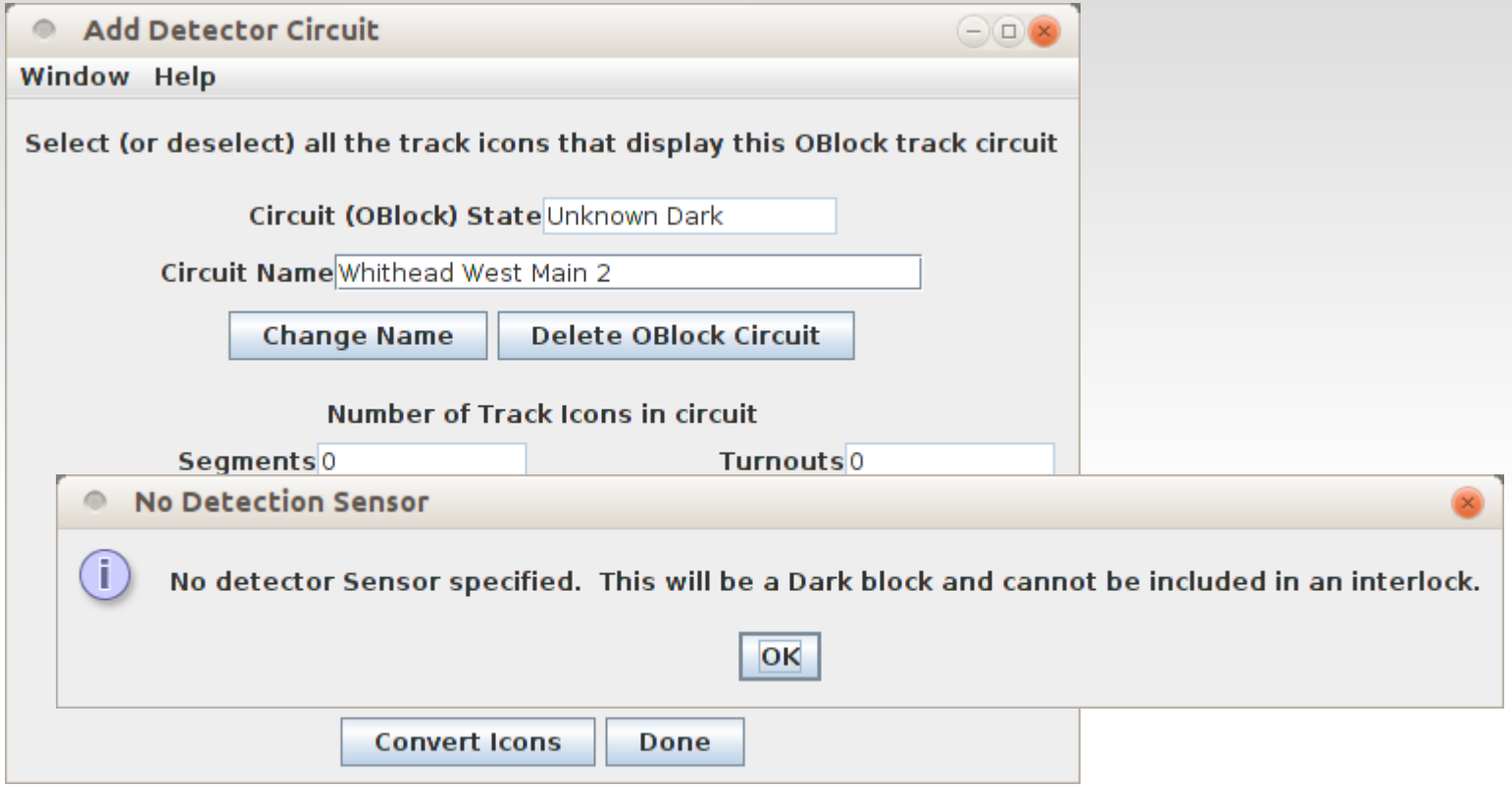
- Now lets add a track circuit for this set of icons. When we first added the Indicator Track we simply assigned it to a sensor. However we can actually define a complete track circuit for later use.
- Select the Circuit Builder drop down and click on 'Add Detector Circuit'
- This opens a small 'New Track Circuit' window. Fill in the System and User Names for this circuit. The System Name will automatically have 'OB' added and be forced to uppercase.

Items – Occupancy Block



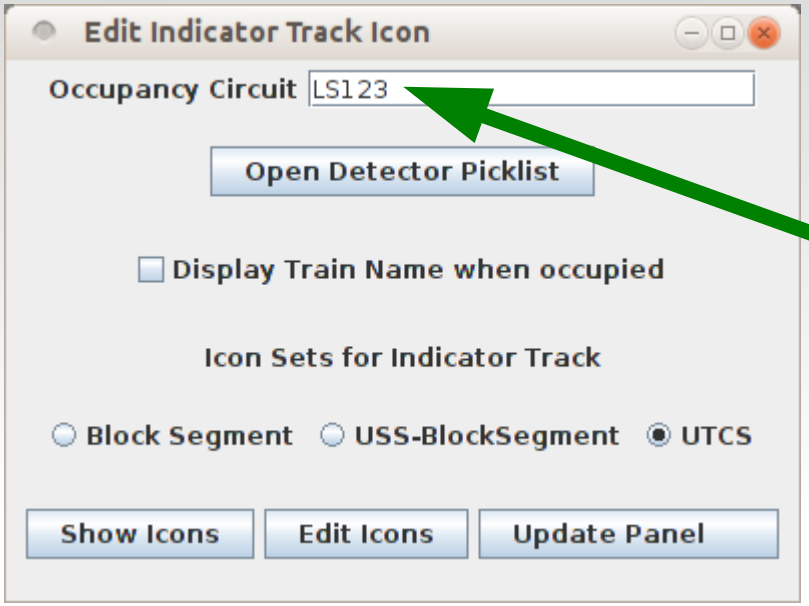
- When we click on 'Add OBlock Circuit' this window opens.
- We can either 'Open Sensor Picklist' and drag the sensor into place, or simply type in 'LS123' to enter the OBlock detection sensor and any error sensor if available.

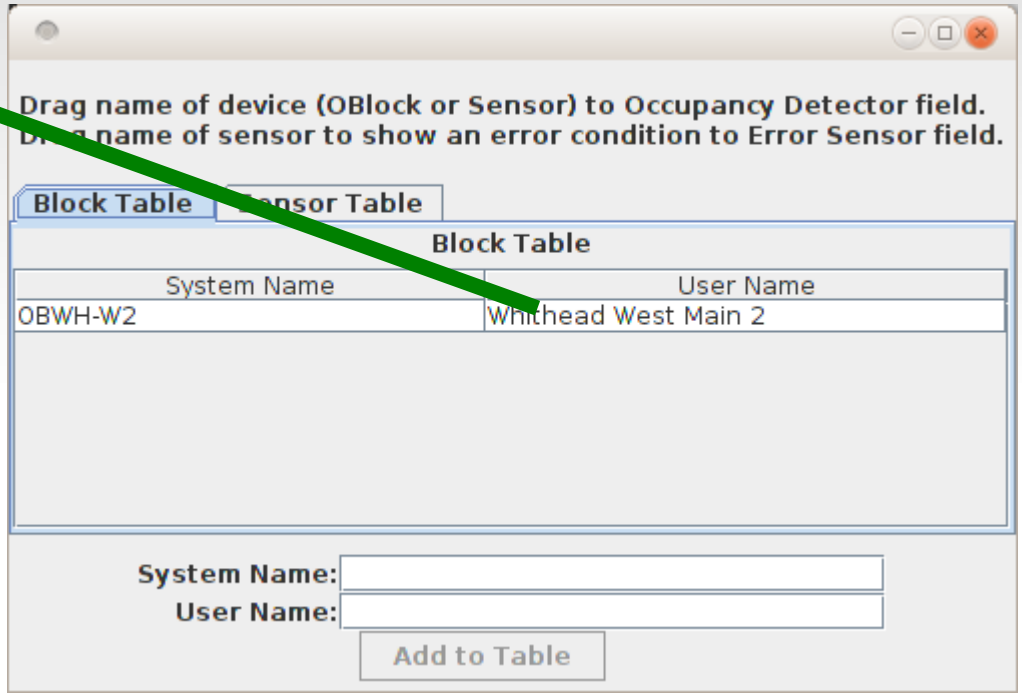
Items – Occupancy Block



- When we click on 'Add OBlock Circuit' this window opens.
- We can either 'Open Sensor Picklist' and drag the sensor into place, or simply type in 'LS123' to enter the OBlock detection sensor and any error sensor if available.
- When we click on 'Done' a warning pops up. This one is because we had attached the track directly to the sensor rather than the OBlock which hadn't existed yet. In Circuit Builder Edit the Circuit OBlock to add the missing sensor to the icon data.

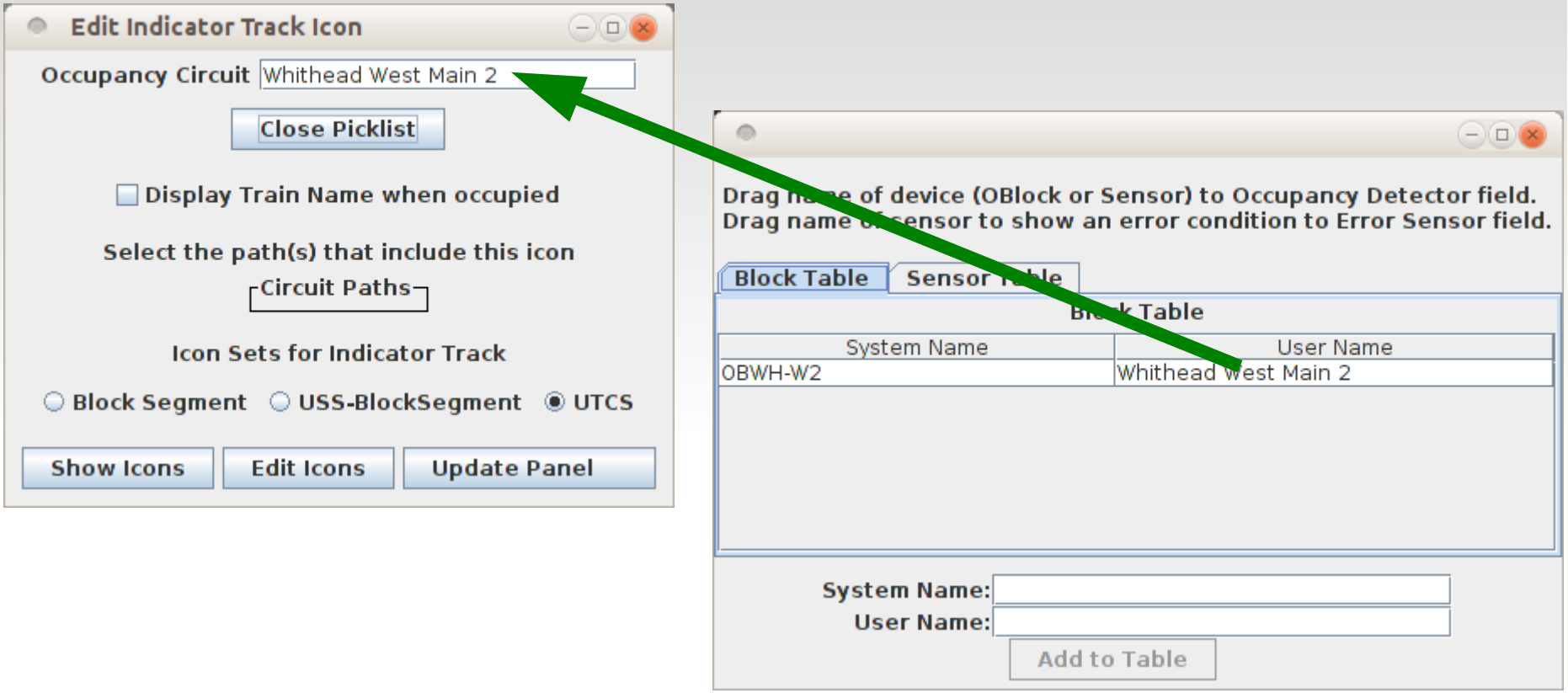
Items – Occupancy Block





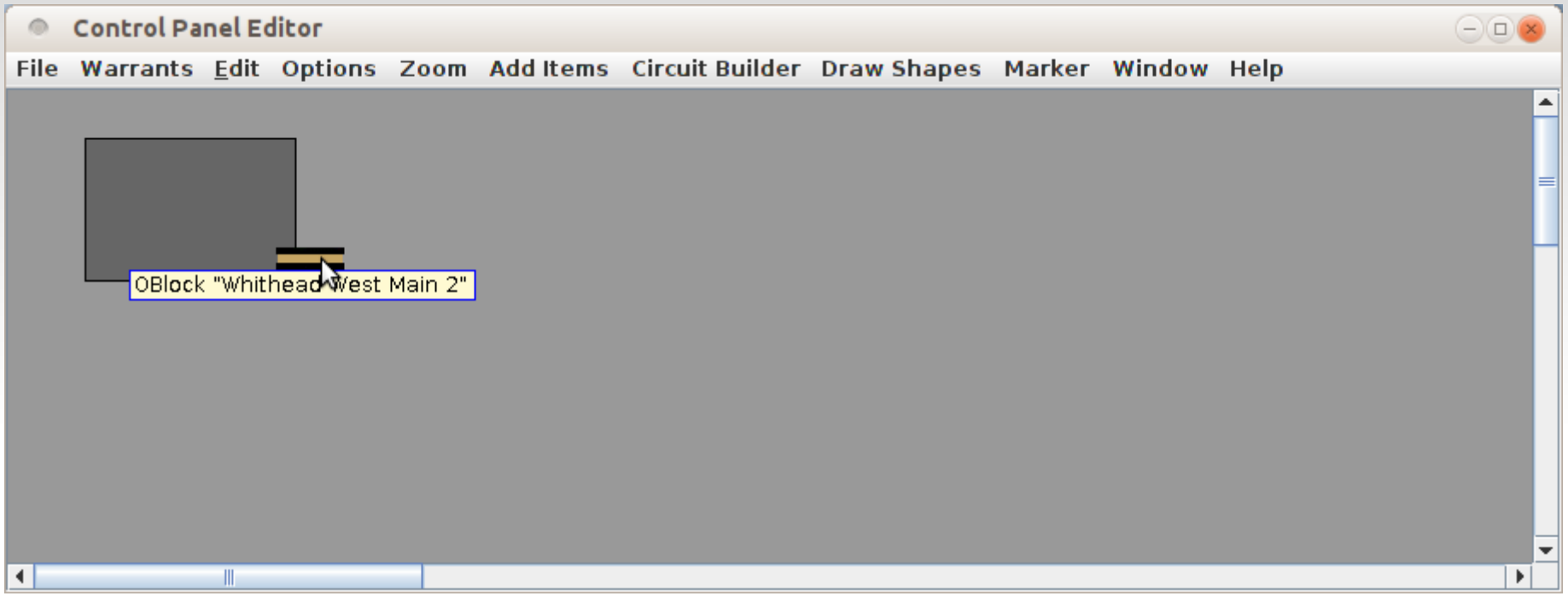
- First we need to correct the track Occupancy Circuit to use the Occupancy Block, not simply the sensor.
- Right Click on the track and select 'Edit Indicator Track Icon'. That opens a window we have seen before. This time when we open the detector pick list choose our new OBlock instead of the sensor. Select the User Name, not the System Name for clarity.

Items – Occupancy Block



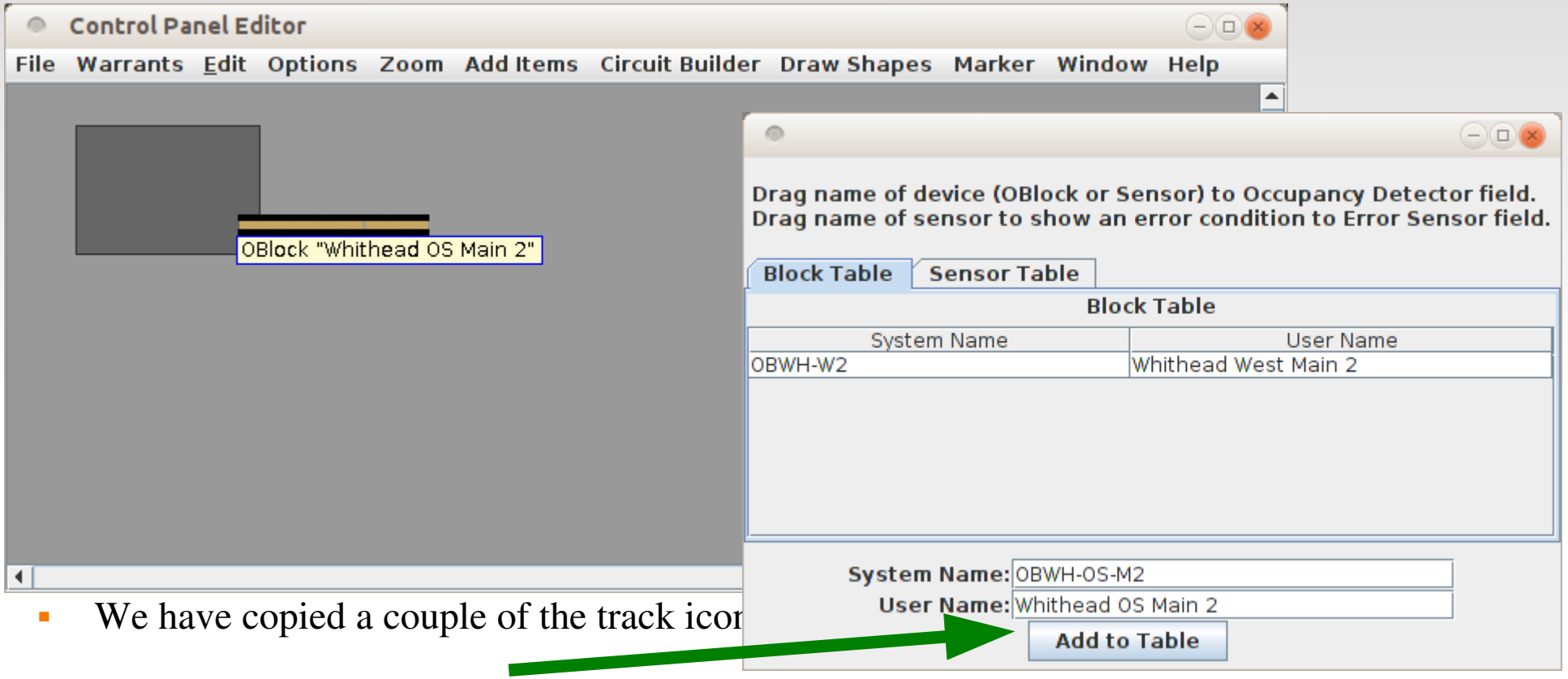
- Now with the User Name listed for the Occupancy of the track icon we can click on 'Update Panel'.

Items – Occupancy Block



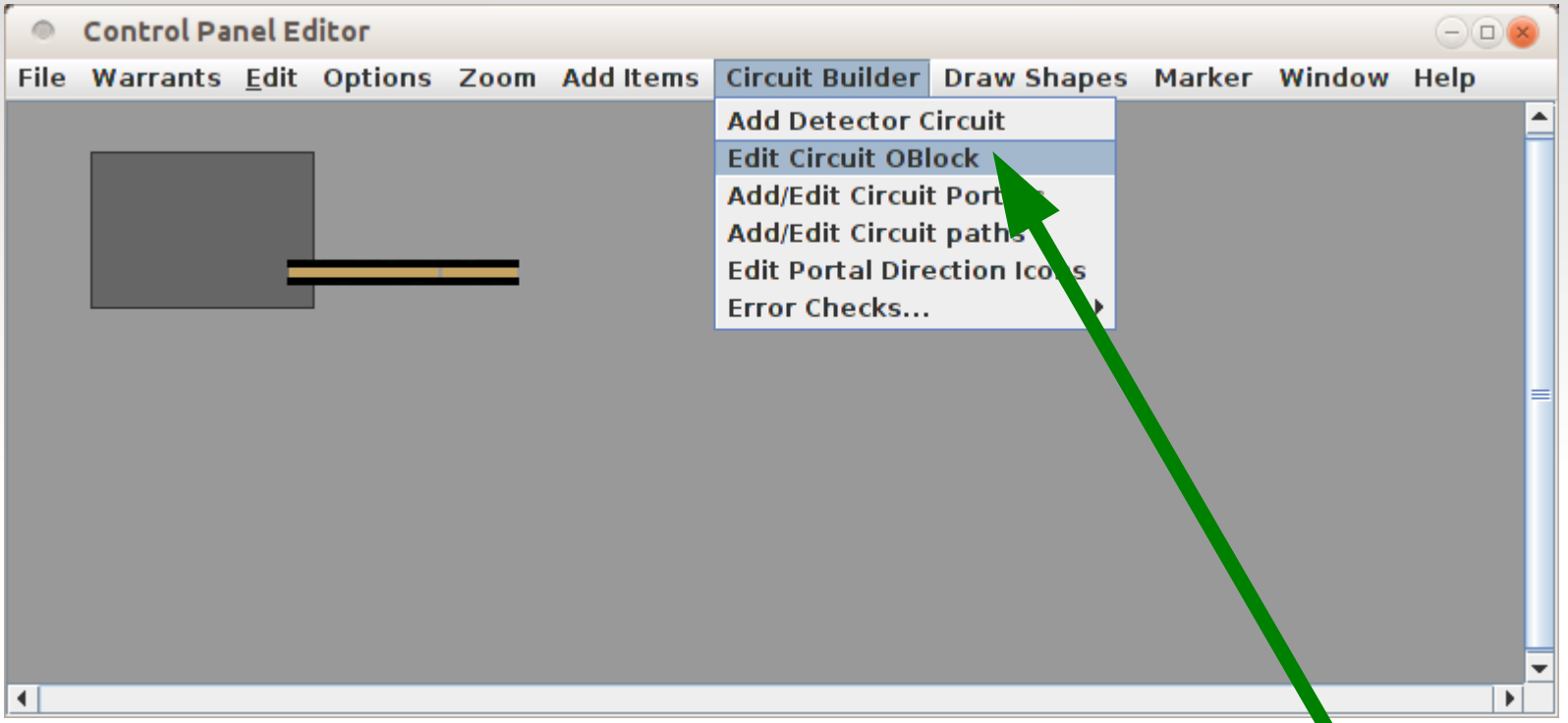
- Its been pretty slow getting to this point, but it gets easier. The Control Panel Editor includes a 'Duplicate' option. Simply right click on the item you need to duplicate, and click on 'Duplicate'. All the details will be duplicated, not just the image.
- The duplicate item will appear with a yellow highlight.  Drag it to its new location.
- The UTCS icon set is designed to indicate a gap when loosly spaced, or no gap when lapped.

Items – Occupancy Block



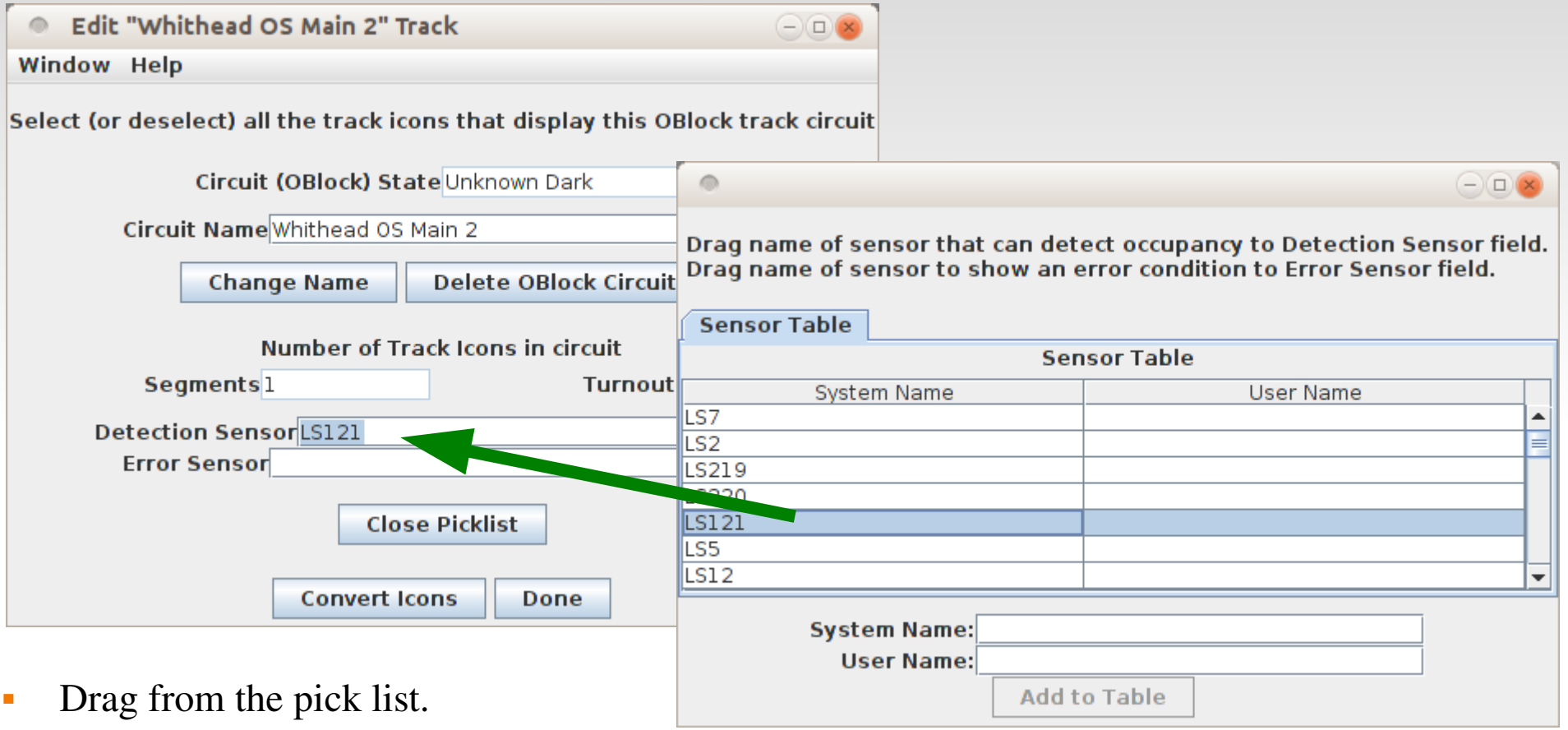
- We have copied a couple of the track icon
- We then changed the OBlock name of the last one to 'OBWH-OS-M2' (OBlock Whithead OS Main 2) by adding it to our table.

Items – Occupancy Block



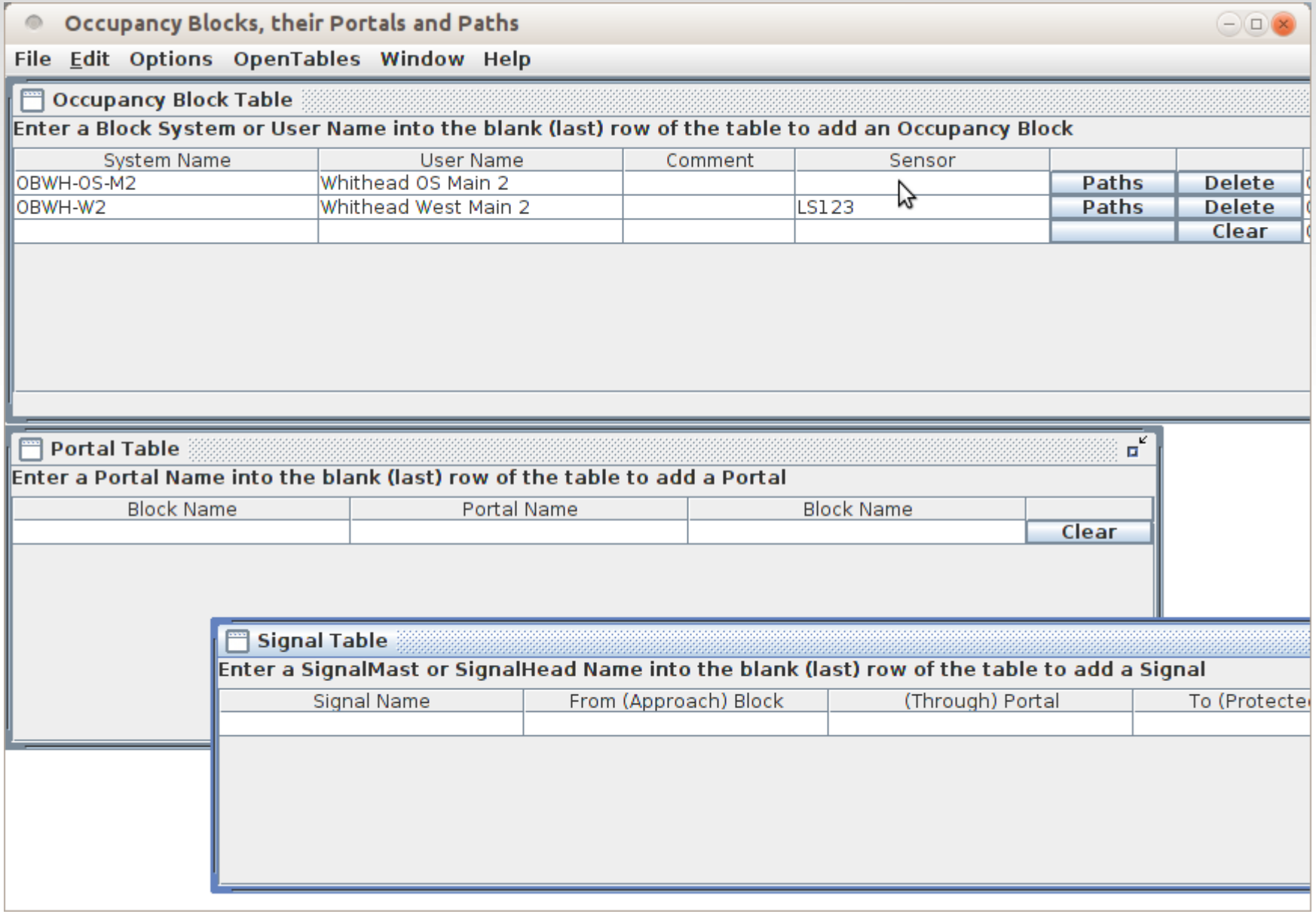
- We have copied a couple of the track icons.
- We then changed the OBlock name of the last one to 'OBWH-OS-M2' (OBlock Whithead OS Main 2) by adding it to our table.
- The problem with this is that we have created a dark block with no sensor.
- Return to the main Control Panel Editor window and select 'Circuit Builder' – 'Edit Circuit Block' and attach the sensor.

Items – Occupancy Block



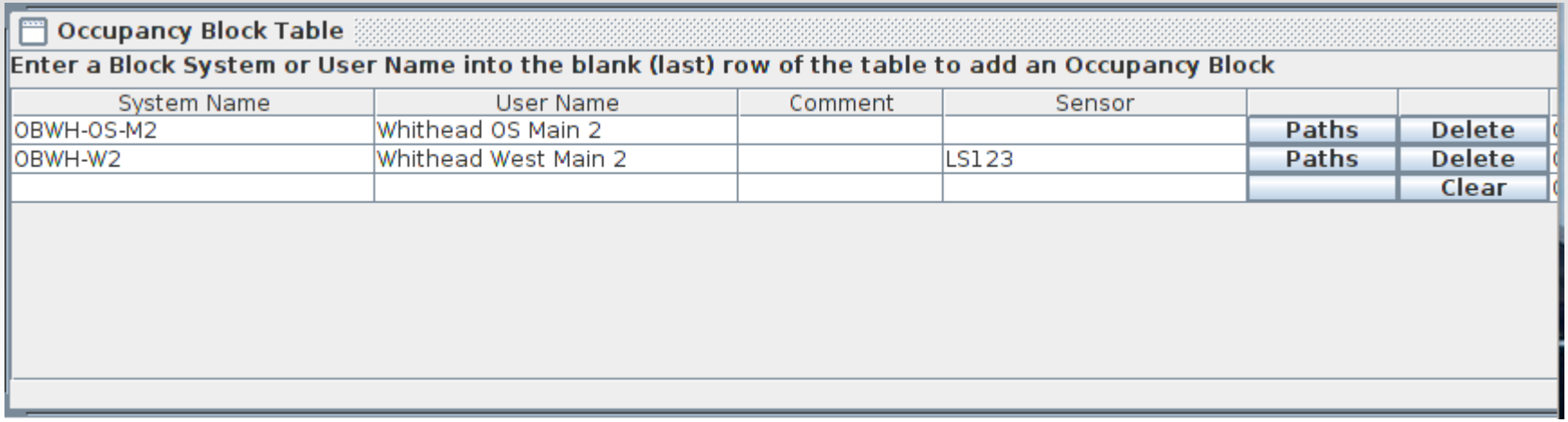
- Drag from the pick list.
- Return to the Circuit Builder and Add Detector Circuits for the rest of our OBlocks.
  Optionally select 'Add Items' → 'Occupancy Blocks' or simply type <Ctrl + b> to open the OBlock table. You may enter items directly into the table by double clicking in any field.

Items – Occupancy Block



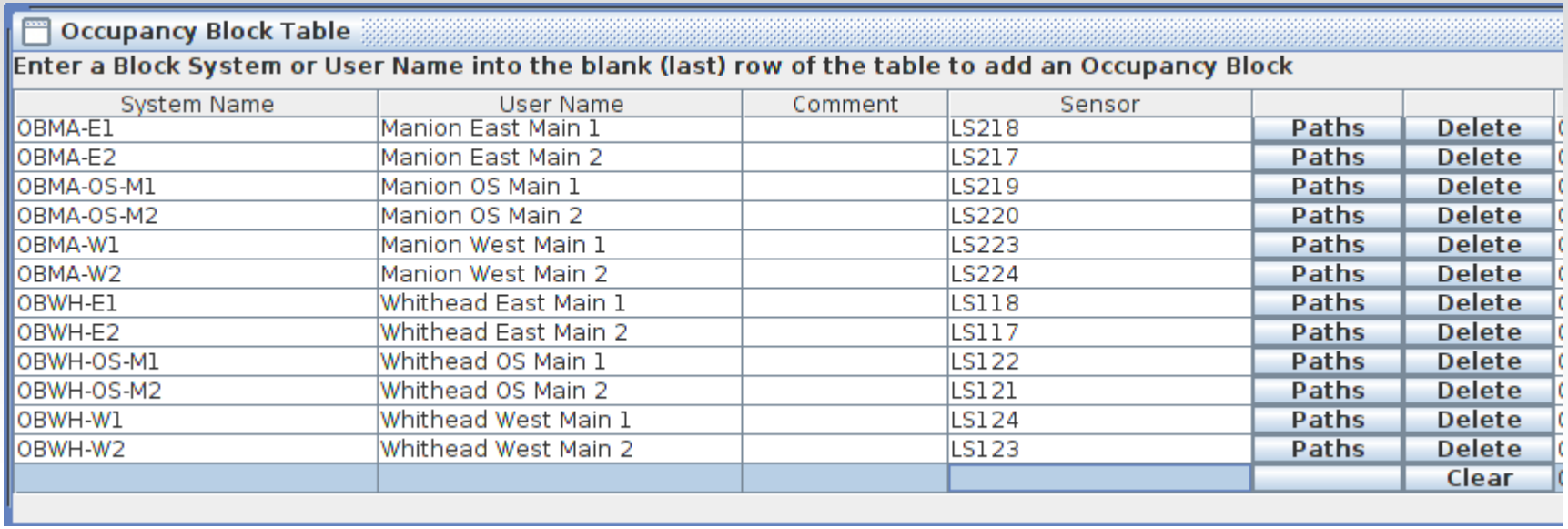
- A new window then opens with several options.

Occupancy Block Table



- At first we are only interested in the Occupancy Block Table portion.
- We already see our original entry and the half entered new entry. To add the desired track occupancy sensor. (LS121) Double click on the entry to edit it.
- Continue by adding in the remaining Occupancy Blocks one at a time in the blank bottom row of the table.

Occupancy Block Table



Occupancy Block Table

Enter a Block System or User Name into the blank (last) row of the table to add an Occupancy Block

System Name	User Name	Comment	Sensor		
OBMA-E1	Manion East Main 1		LS218	Paths	Delete
OBMA-E2	Manion East Main 2		LS217	Paths	Delete
OBMA-OS-M1	Manion OS Main 1		LS219	Paths	Delete
OBMA-OS-M2	Manion OS Main 2		LS220	Paths	Delete
OBMA-W1	Manion West Main 1		LS223	Paths	Delete
OBMA-W2	Manion West Main 2		LS224	Paths	Delete
OBWH-E1	Whithead East Main 1		LS118	Paths	Delete
OBWH-E2	Whithead East Main 2		LS117	Paths	Delete
OBWH-OS-M1	Whithead OS Main 1		LS122	Paths	Delete
OBWH-OS-M2	Whithead OS Main 2		LS121	Paths	Delete
OBWH-W1	Whithead West Main 1		LS124	Paths	Delete
OBWH-W2	Whithead West Main 2		LS123	Paths	Delete
					Clear

- Here we see the completed section that covers the tracks of the demo layout.
- These Occupancy Blocks are now available as occupancy information for any track that we will add to the control panel.
- We typed in all of our sensors. Optionally we can open the 'Item Palette', choose the 'Sensor' tab, and drag the sensor into each field. For 'LS121' this seems like the hard way to do things, but for more complex items it can save typing and possible errors.
- Length, speed and other values are options to be compatible with JMRI Blocks for setting train speeds when using Dispatcher and Active Trains, and may be ignored for now. 'Warrants' uses the Mast Aspect indications to control train speeds.

Occupancy Block Table

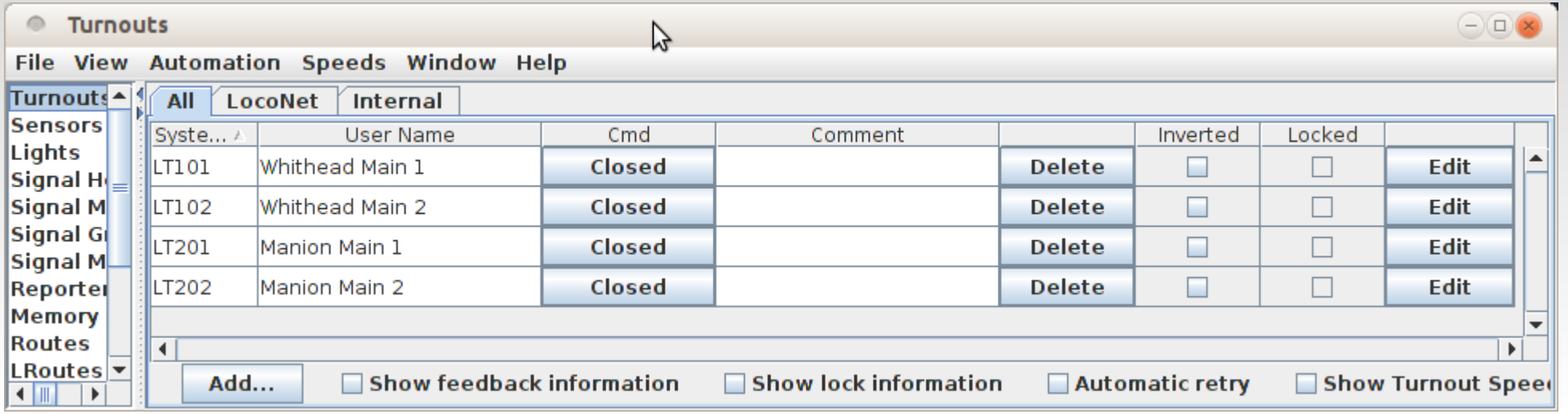
Summerizing:

- System Name - is the internal name used by JMRI for each Occupancy Block.
- User Name - as we entered it will show in tool tips and selections for better understanding.
- Comments - are for extra info.
- Sensor - is the system event name/number used by the detection hardware.
- Paths - are the various possible routes through the OBlock from one Portal to another Portal.
- To delete an OBlock click on the 'Delete' button.
- Length, Curvature, etc. - are options to be compatible with JMRI Blocks for setting train speeds when using Dispatcher and Active Trains.
- To manually add a new OBlock simply select the last (blank) entry and start entering data.
- The System Name will automatically be corrected if you do not include the initial 'OB' or fail to enter it in upper case.
- The Occupancy Block Table may be sorted by any column simply by clicking on the column header. Click on the arrow to change the order.

Occupancy Block Table

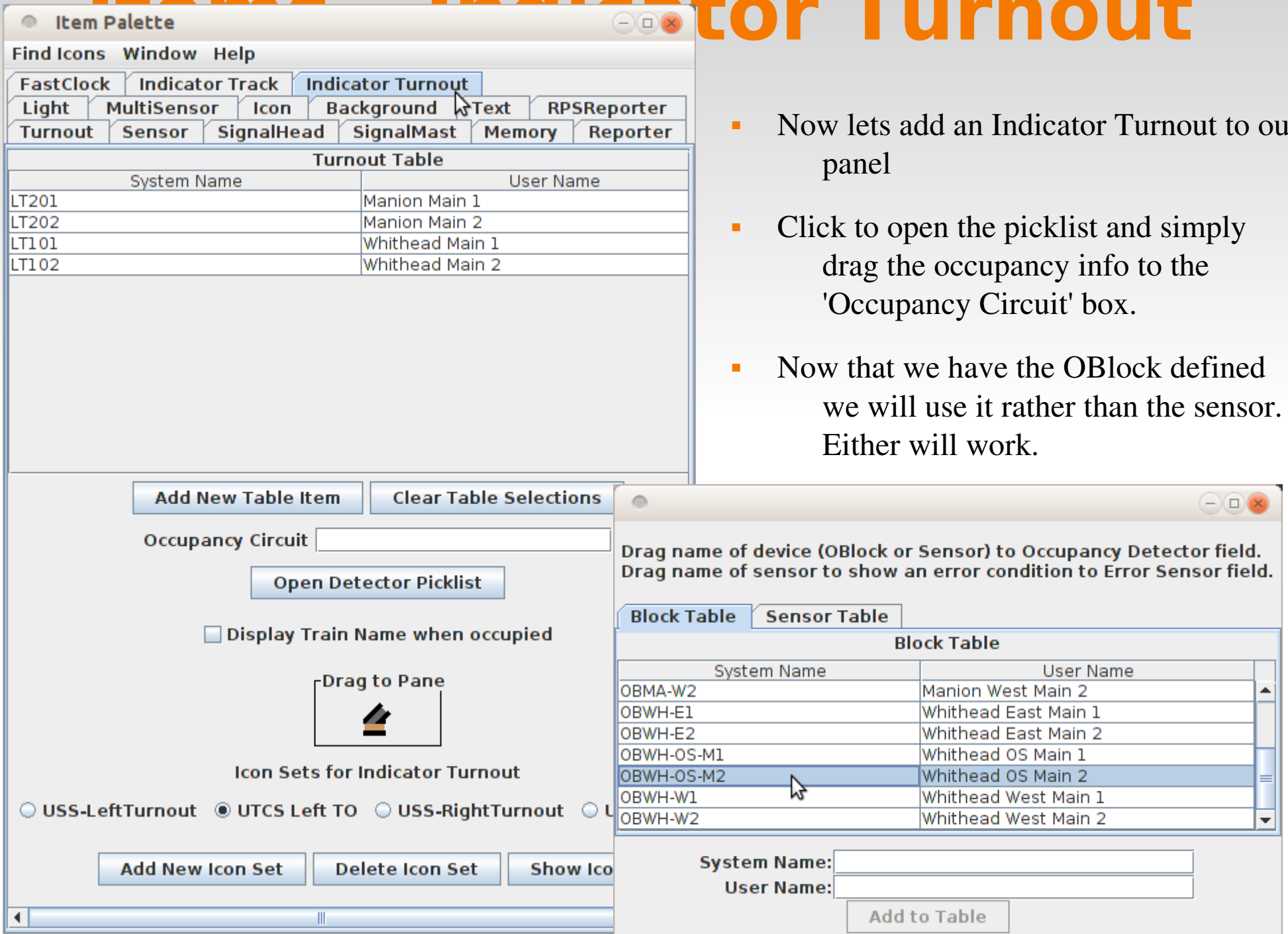
- Blocks are implemented as JMRI OBlocks, which are extensions of JMRI Blocks. They have the following characteristics:
  - An OBlock has from 1 to N Portals, or ways to enter/exit the block.
  - Although an OBlock can be defined without a sensor, i.e. a "Dark Block", it should normally have a sensor. If it has more than one physical sensor, these sensors should be "OR"ed together and trigger a single internal sensor for the block. This may be done electrically or logically by using Logix or layout hardware.
  - An OBlock has from 1 to N paths. A path is a route through the block from one portal to another.
  - An OBlock has 0 to N turnouts.

Items – Indicator Turnout



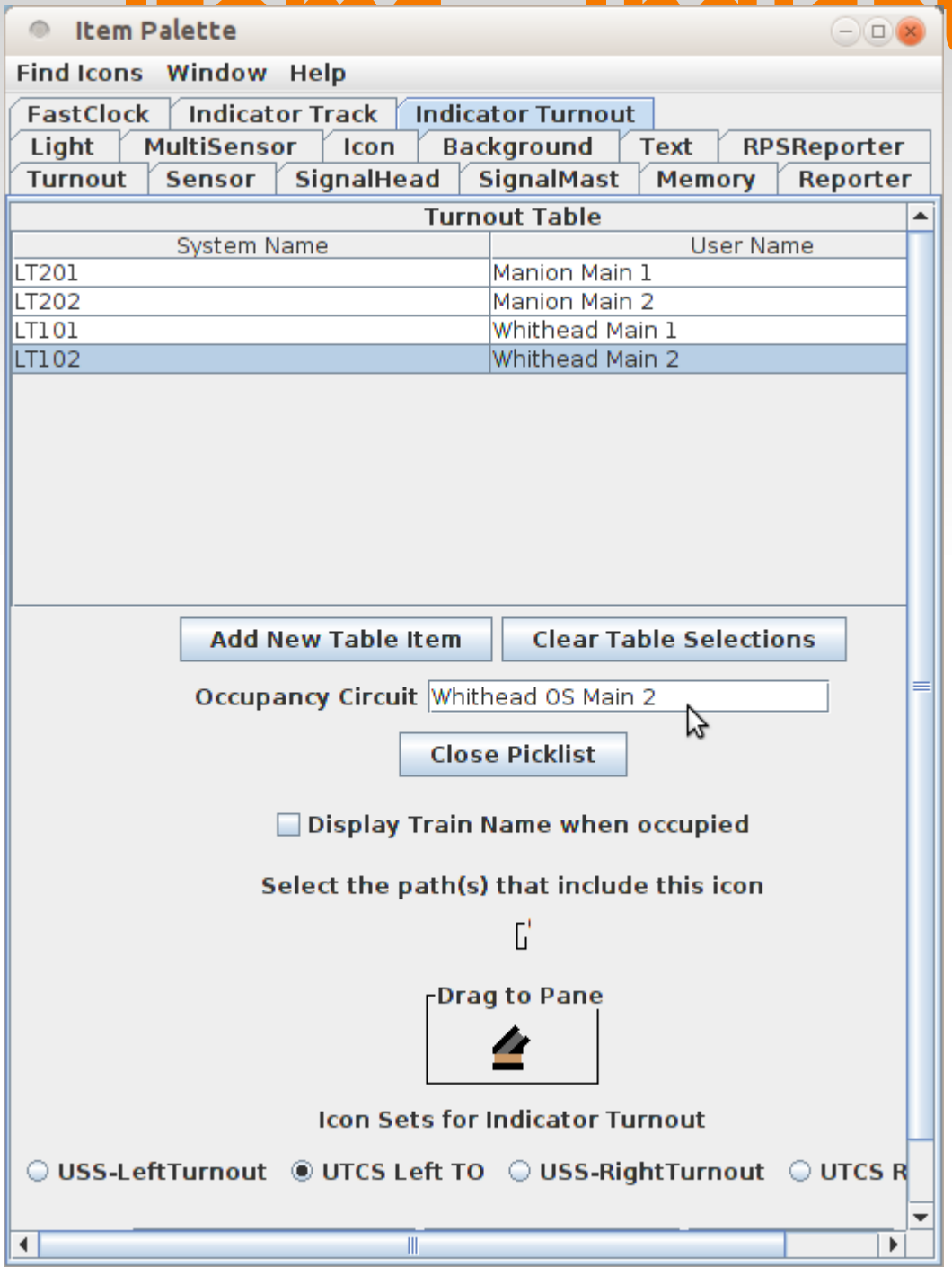
- Now we will add an Indicator Turnout to our panel, but first use the Turnout Table to setup and test the hardware.
- Add user names and any other options such as feedback sensors.
- Once the actual turnouts are working we can add them to our panel.

Items - Indicator Turnout

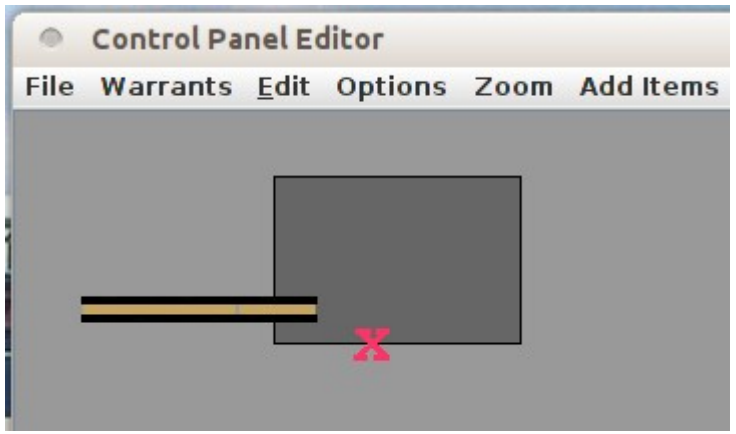


- Now lets add an Indicator Turnout to our panel
- Click to open the picklist and simply drag the occupancy info to the 'Occupancy Circuit' box.
- Now that we have the OBlock defined we will use it rather than the sensor. Either will work.

Items – Indicator Turnout



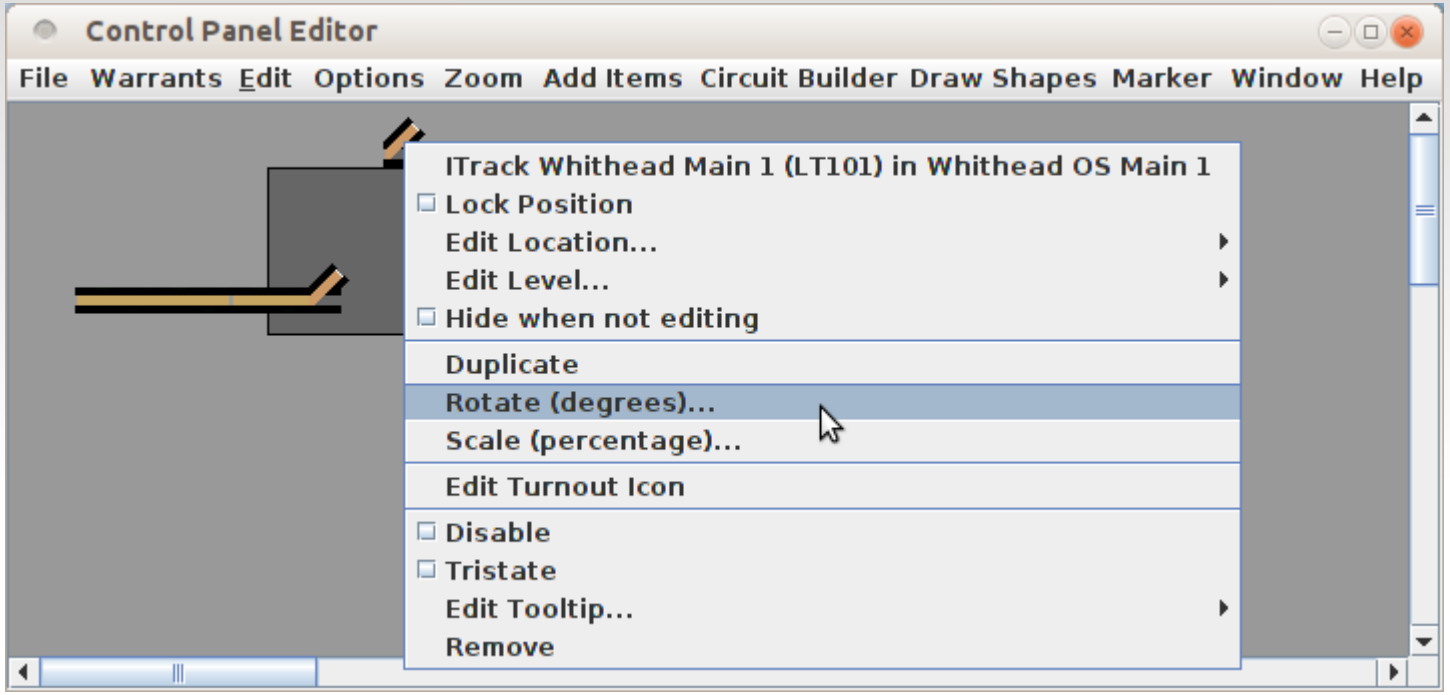
- Highlight the entry in the Turnout Table.
- Drag the icon to your panel
- Now that we have the OBlock defined we will use it rather than the sensor. Either will work.
- If the turnout appears as a red X when you drag itto the panel, simply click it.
- Once it appears you can place it properly.



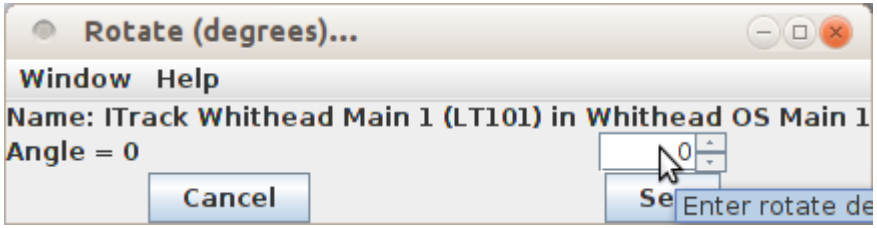
Items – Indicator Turnout

- To fine tune the image positions note that the images each have a transparent row of pixels at the ends of the indicator sections. If you butt the icons together, then the dark field will show through as a 'Gap'. (In this example it is light gray)
- If you crowd the icons together, then the transparent portion isn't visible and the line appears to be continous.

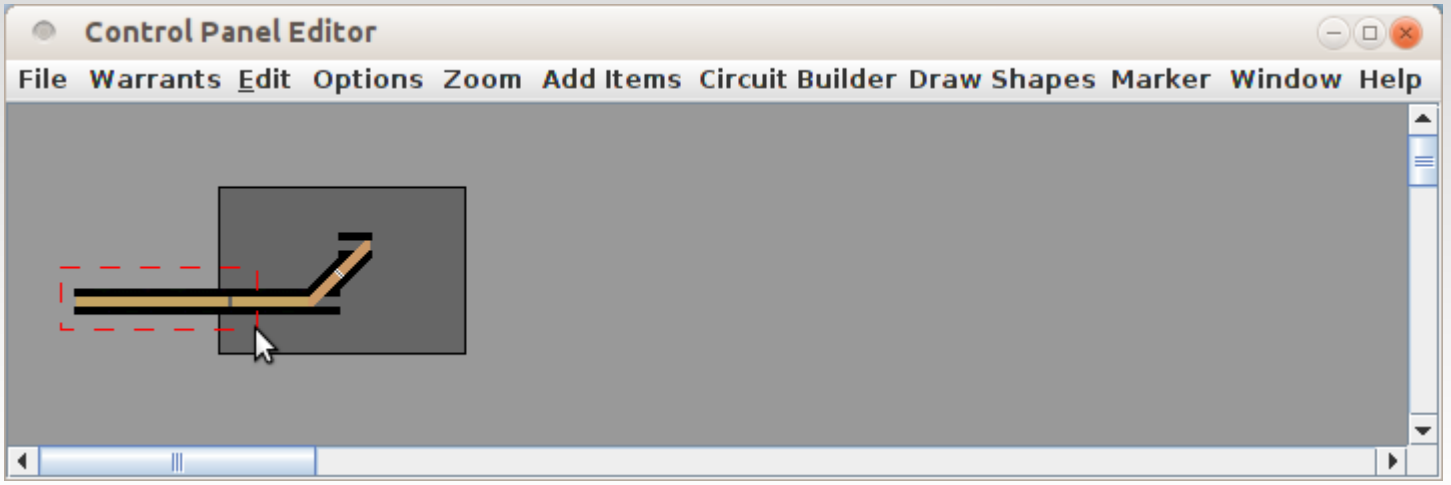
Items – Indicator Turnout



- The second Indicator Turnout is not inverted as we need it to be.
- Open the icon menu by right clicking and select 'Rotate (degrees)'
- Enter 180 then click 'Set'.
- The icon can now be moved into place.

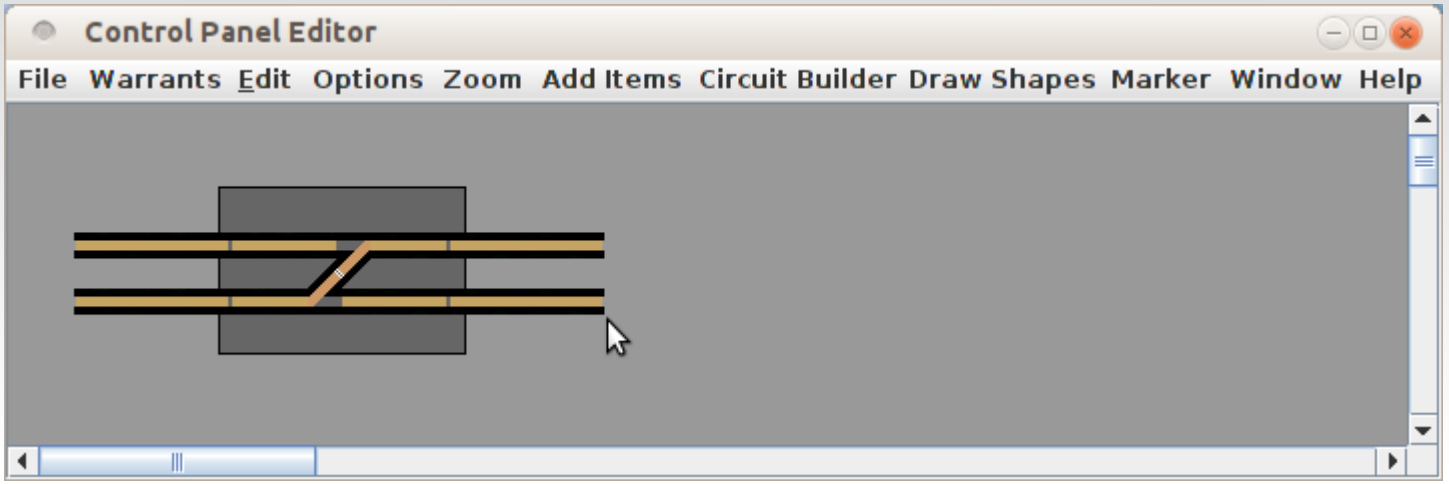


Items – Duplicate



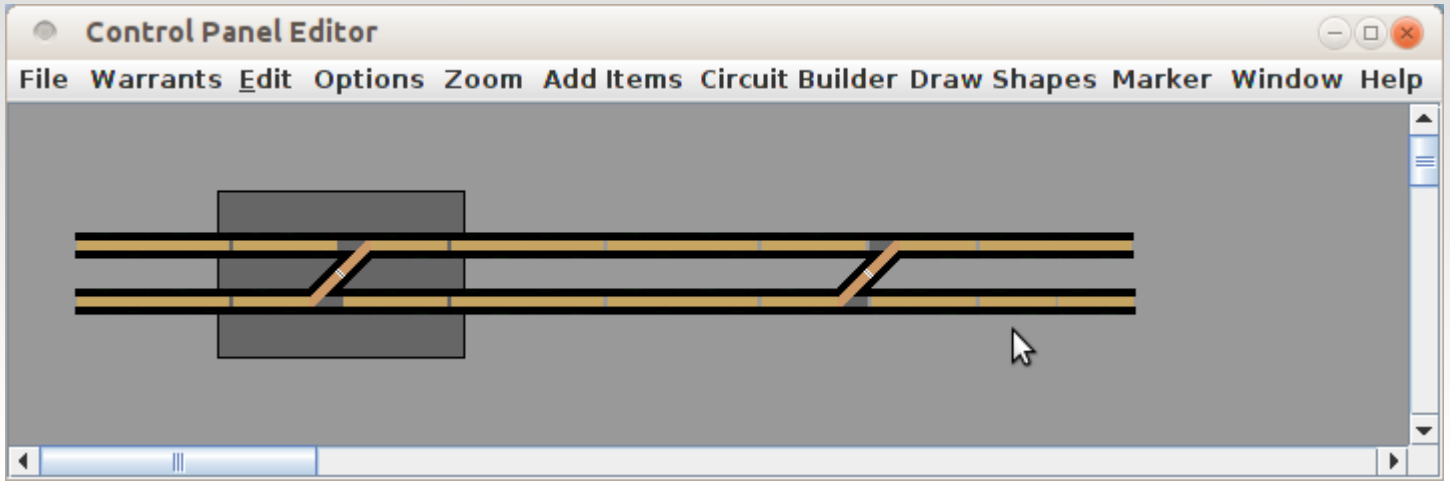
- If you left click in an open area of the panel you can create a 'Surround' box that will select all items included within it. The selected items will have yellow boxes around them.
- Open the icon menu of any selected item by right clicking and select 'Duplicate'
- As with a single item, all selected items will be duplicated.
- The duplicated icons can now be moved into their new place.

Items – Duplicate



- After a few uses of 'Duplicate' we now have the above panel.
- Open the icon menu of each newly created item by right clicking and selecting 'Edit Indicator Track Icon'.
- Click on 'Open Detector Picklist' and drag their new OBlock names into each icon, then click on 'Update Panel' for each.
- Don't forget to do a 'File' - 'Save Panels' as you add to your work.

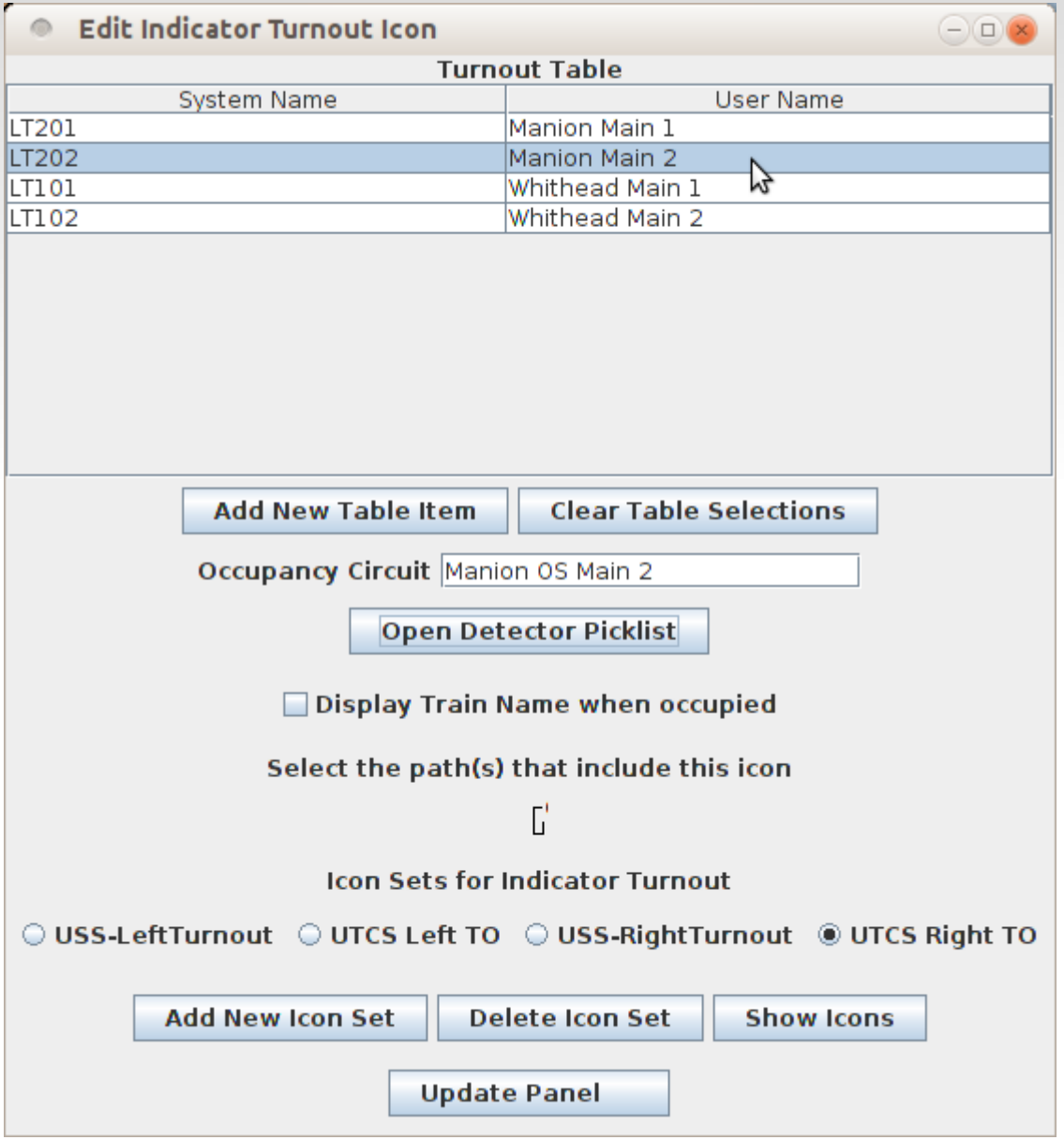
Items – Duplicate



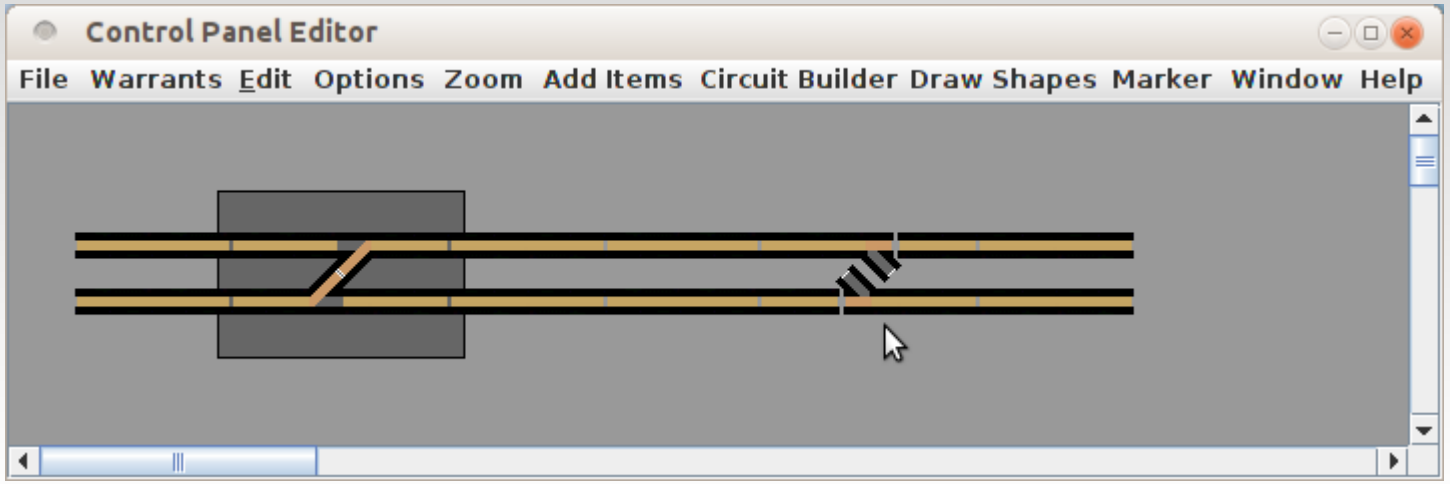
- One more group duplicate gives us the above.
- Again go through the newly duplicated icons and update each of their references.

Items – Duplicate

- Now right click to open 'Edit Turnout Icon' to open this window.
- Change the 'System Name'.
- Open the Detector Picklist and change the 'Occupancy Circuit'.
- Change the selected Icon Sets from 'UTCS Left TO' to 'UTCS Right TO'.
- Click on 'Update Panel' to correct the icon.
- Do the same for the second turnout icon.

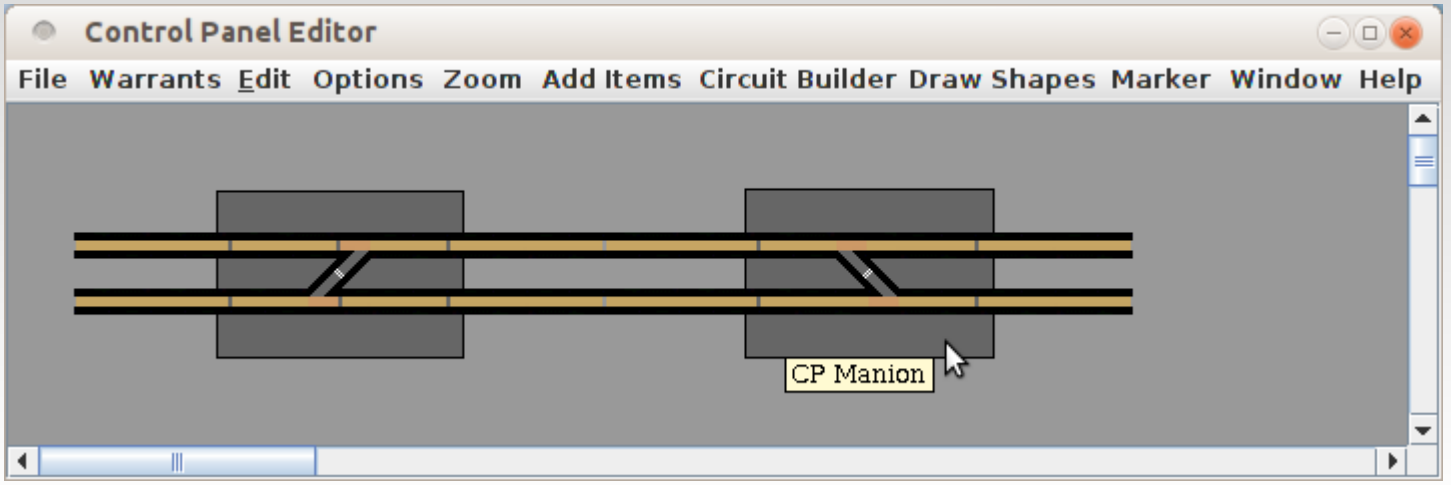


Items – Duplicate



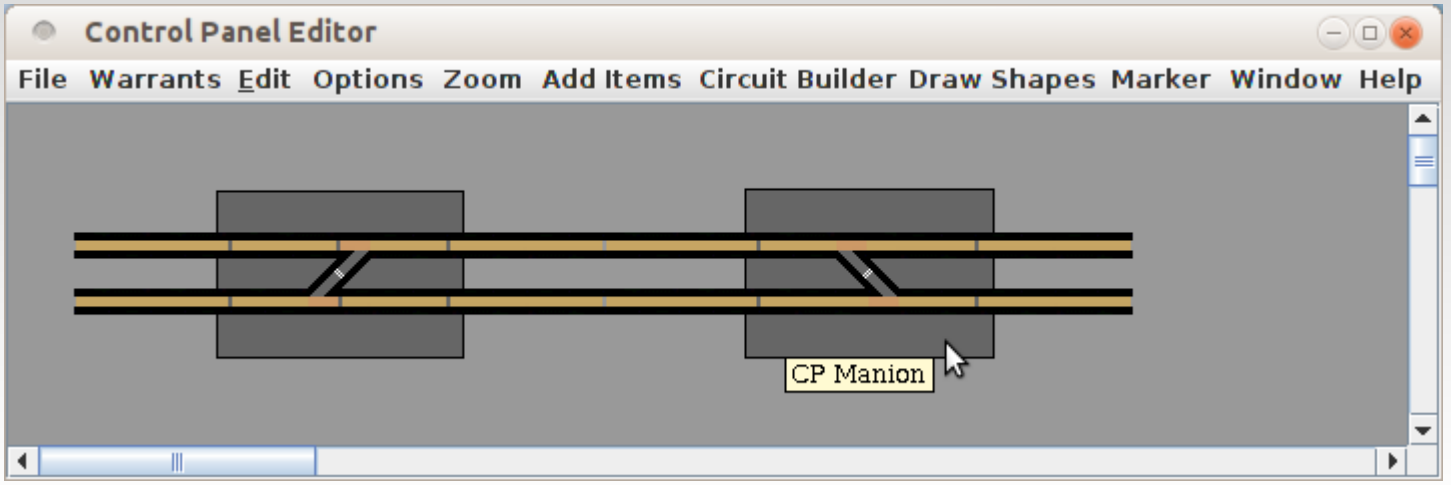
- Now we have the correct facing turnouts and icon information. However they are not yet in their correct locations.
- Move them and their connecting track segments around to correct the icon positions.

Items – Duplicate



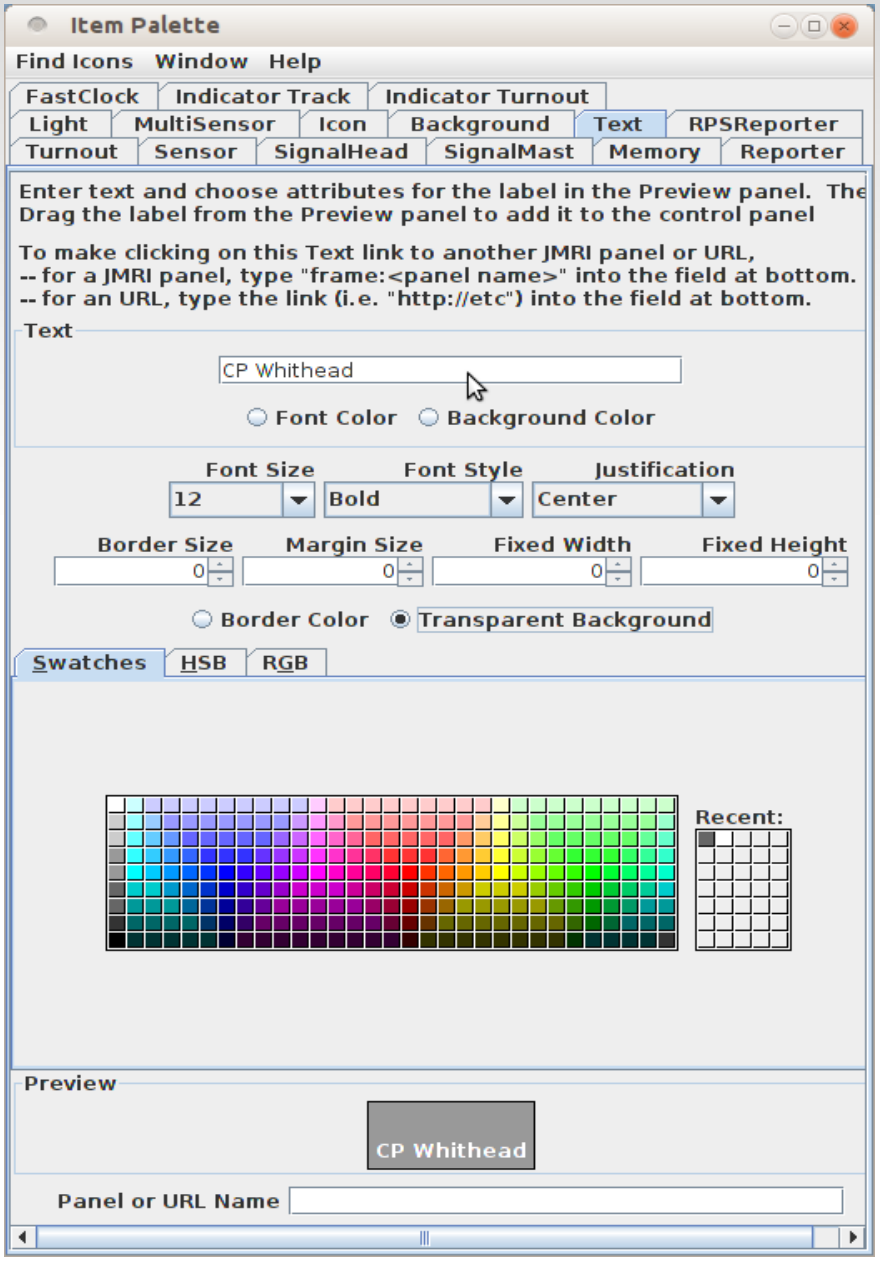
- Add another background box. Be sure to change its Level to '2', and change its 'Tooltip' to the correct name. (in this case 'CP Manion')

Items – Text



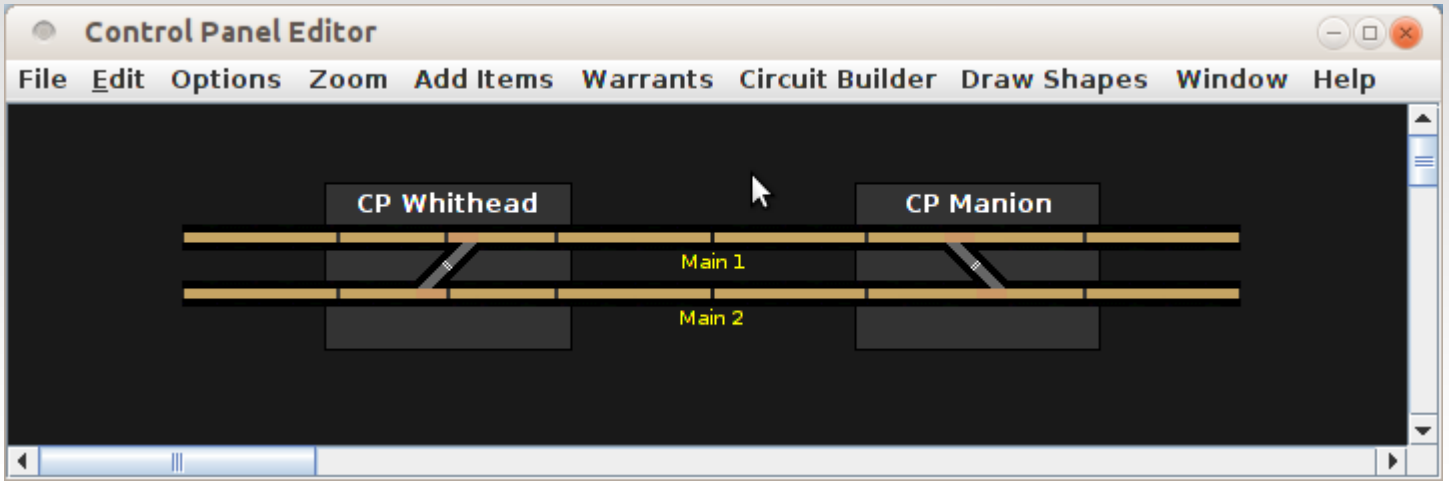
- Add another background box. Be sure to change its Level to '2', and change its 'Tooltip' to the correct name. (in this case 'CP Manion')
- To add text labels to the panel click on 'Add Items', select the 'Item Palette', and then click on the 'Text' tab.
- A little bit of text dresses the panel up and makes things a lot more clear.

Items – Text



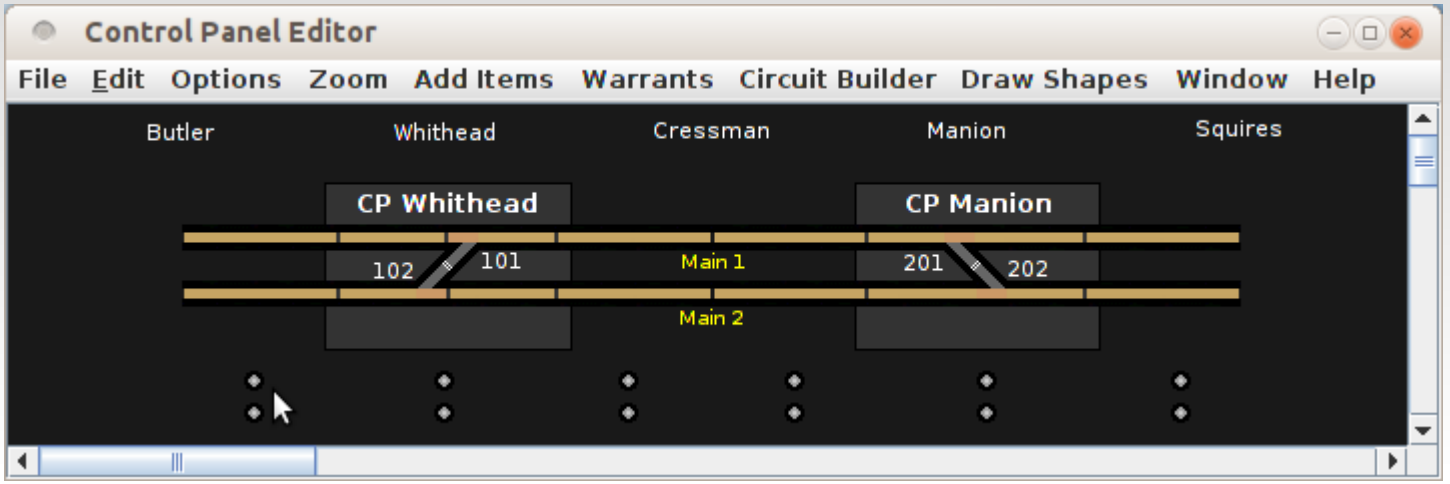
- Adding text to a panel with the Control Panel Editor is much easier than with the Panel Editor. When you select 'Text' from the item palette this window opens up. It has all the required configuration information in one place. Once you make your format choices and add the text you place it on the panel by dragging and dropping from the preview box to the panel.
- Once you have placed a text item you can right click it and select 'Edit Text' to just change the text, or else select 'Edit Text Attributes' to change not only the text, but any other attributes such as size or style as well.
- With 3.4 you can now easily make jump-to text that go to new panels or web links.

Items – Background Color



- Now we can change the background color to black and see the results of using some dark gray rectangles for demarking control points. We also moved everything to the center.
- Actually there is no 'Edit' window to change the background color. Simply select 'Background' from the Item Palette again, and assign a new color. I wanted something darker than the darkest grey swatch which is (51, 51, 51), but not pure black (0, 0, 0). To create this custom color background select the 'RGB' tab and enter whatever value you need. I used (25, 25, 25) in this example.
- If you have a image that you prefer as a background, then place it in your preferences directory in a folder named 'resources'. It will then show up when you click 'Add Icon'.

Items – Text



- For this clinic we will dress it up even more.
  - White Text = Locations
  - White Numbers = Turnouts
  - Small Jewels = Sensors for test and demo use
  - Yellow = Main Line lables

Questions

- ?