
Basic JMRI Operations with NO paper!

-- M Steve Todd

<https://mstevetodd.com/clinic.pdf>





1. Get started

Avoid analysis paralysis!

Don't wait until you are completely ready to begin. That will never happen.

→ **You WILL make mistakes**

The best laid plans, yada yada.
Seriously, it won't hurt.

→ **You WILL learn from them**

And get better each time around.

→ **Start SMALL!**

Regardless of your layout size, add only a few cars in one yard and a couple of industries. Less to redo as you learn!

2. Basic Basics

→ JMRI Installed

From JMRI.org

→ PanelPro or DecoderPro?

They're the same program!

→ Simulator Connection or Live

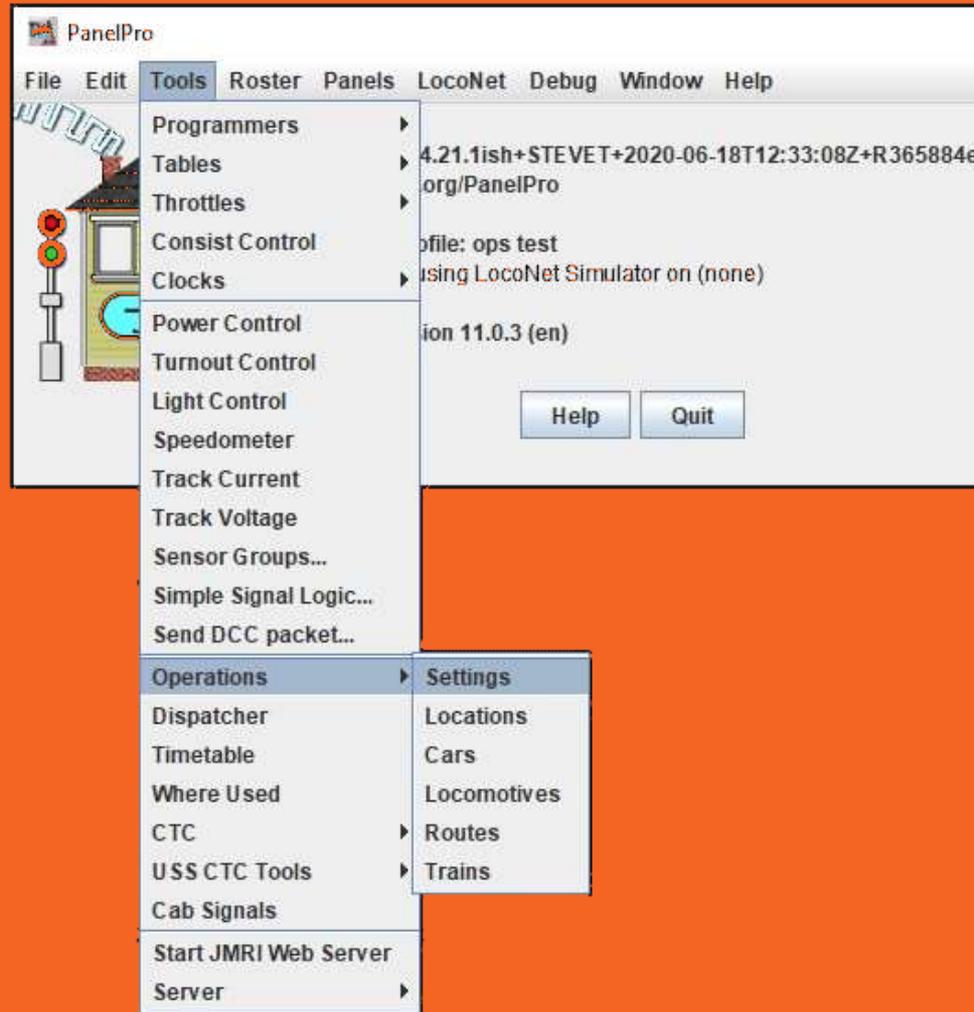
Live allows throttle and conductor on the same device. More on this later....

→ Add Operations Menu

See screenshots

→ No "Story" (yet)

Just moving closed cars of appropriate types



OperationsPro Settings

Tools Operations Window Help

Railroad Name: North/South East/West

Scale: Z N TT HO3 OO HO Sn3 S On3 O G

Maximum Train Length: Max Locos per Train: Horsepower per Ton: Switch Time (minutes): Travel Time (minutes):

Car Types: Descriptive AAR Codes Unit of Length: Feet Meters Optional Year Modeled:

Options: Add Operations Menu to Main Menu Close Windows on Save Auto Save Auto Backup

Panel Options: Create Train Icons on Panel (use panel name): Train Icon Options: Append Loco Number Enable Icon SetX&Y

Icon Colors:

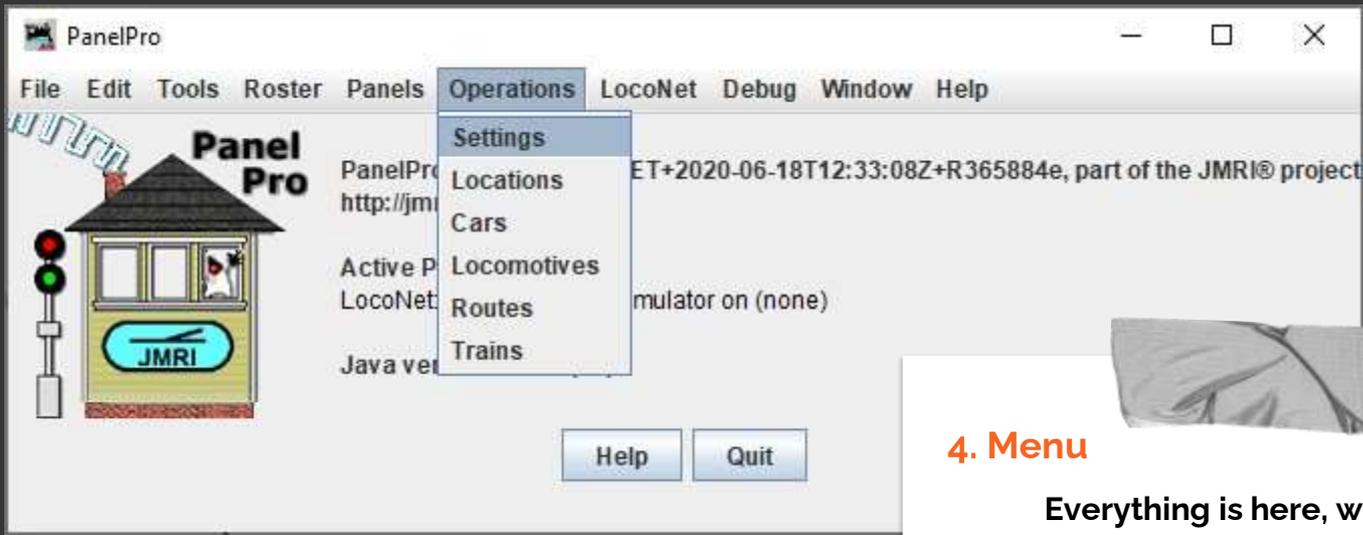
Northbound Train Icon Color	White
Southbound Train Icon Color	White
Eastbound Train Icon Color	White
Westbound Train Icon Color	White
Switcher Icon Color	White
Terminated Train Icon Color	White

Comment:

Restore Backup Save

3. Settings

- Don't worry about everything on this screen.
- You will come back later

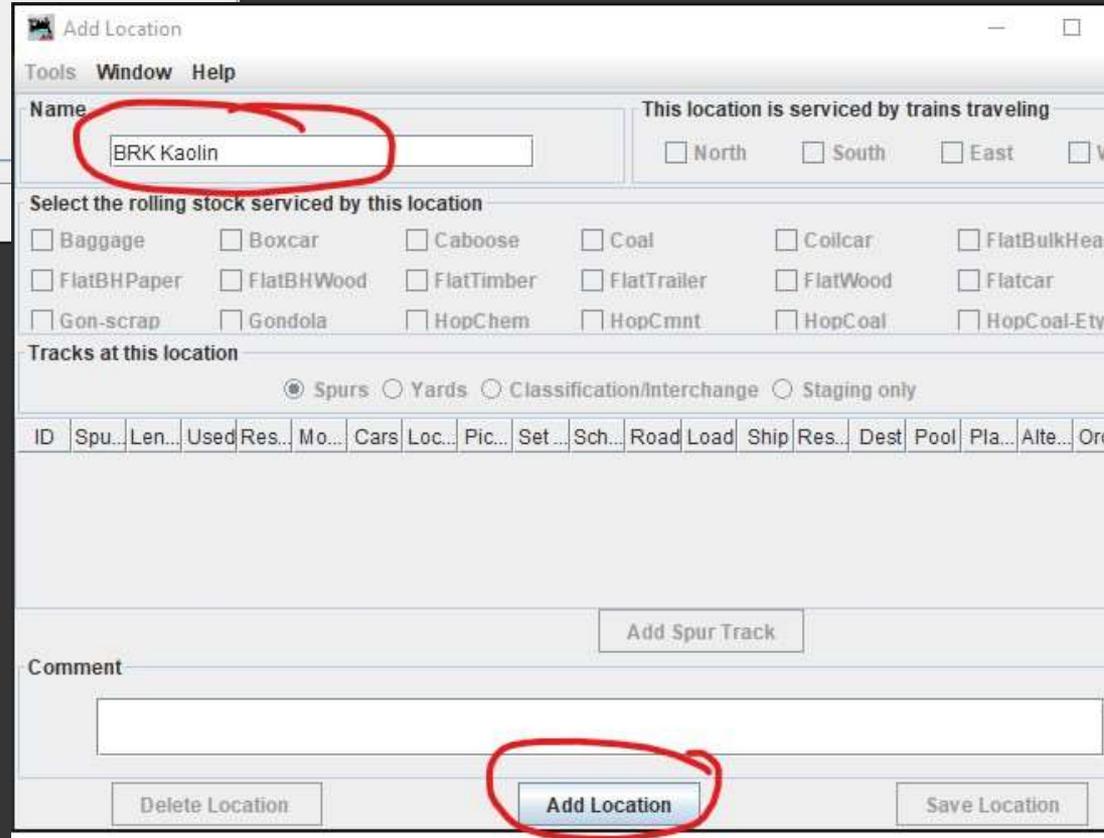
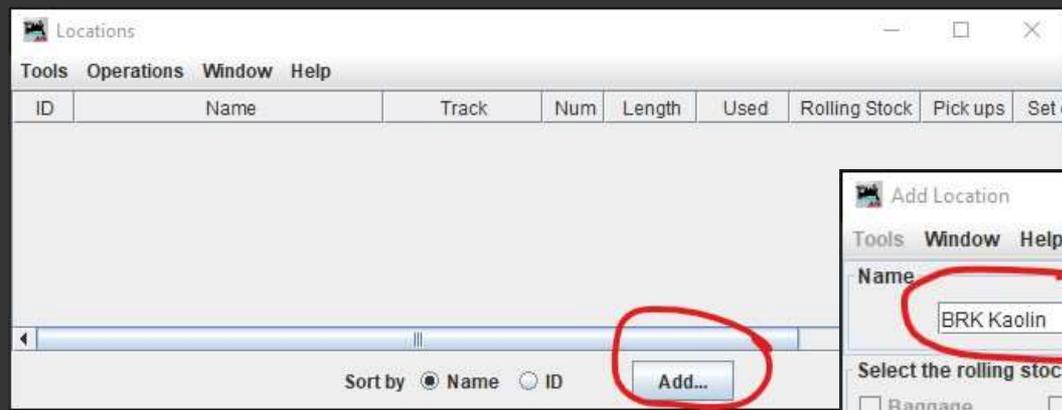


4. Menu

Everything is here, we'll work in this order:

1. Locations
 - a. Tracks
2. Cars
3. Routes
4. Trains

Locations



Tip

Some "Add" screens require that you enter the name, then press "Add ..." to enable the full input. Don't ask me why.



MB Samuel Packaging

Notes

Trailing point switch for West trains.
No runaround, so no East trains.
Can process 3 cars, with overflow for 2 more.
Define as 1 "Track",
could be 3 "Door"s one day.

Locations



Spurs

Change Loads to Empties and vice versa

Yards

No change

Direction

I have no runaround here, so only West-bound trains should service this location.

Add Track

Locations don't have to have tracks, but all mine have at least one

Car Types

Only Boxcars (for now)

Add Location

Tools Window Help

Name:

This location is serviced by trains traveling: North South East West

Select the rolling stock serviced by this location:

Baggage Boxcar Caboose Coal Coilcar FlatBulkHead
 FlatBHPaper FlatBHWood FlatTimber FlatTrailer FlatWood Flatcar
 Gon-scrap Gondola HopChem HopCmnt HopCoal HopCoal-Ety
 HopGrain HopSand Hopper MOW MOWBox Passenger
 ReefMech Reefer ReeferIce Stock Tank Food Tank Gas

Tracks at this location:

Spurs Yards Classification/Interchange Staging only

ID	Spur Name	Length	Used	Reserved	Cars	Locos	Pick ups	Set outs
----	-----------	--------	------	----------	------	-------	----------	----------

Comment:

Tracks

Name

Keep it short. More on this later.

Length

I want to allow three 50ft cars here, so I set to 160ft. Get fancy later.

Direction

Can filter Location direction (if more than one)

The screenshot shows the 'Add Spur Track' dialog box with the following fields and options:

- Name:** Trk1
- Length:** 160
- Direction:** This spur is serviced by trains traveling West
- Select the rolling stock serviced by this spur:** Boxcar
- Road Option:** Track accepts all roads
- Load Option:** Track accepts all loads
- Select trains or routes for car set outs:** Any Trains Routes Exclude Trains Exclude Routes
- Select trains or routes for car pick ups:** Any Trains Routes Exclude Trains Exclude Routes
- Optional Schedule:** [Dropdown] [Add]
- Comment:** [Text area]
- Buttons:** Delete Spur Track, Add Spur Track, Save Spur Track

Locations

ID ▲	Name	Track	Num	Length	Used	Rolling Stock	Pick ups	Set outs	Action	Edit
1	BRK Kaolin	Spurs	2	750	162	3	0	0	Yardmaster	Edit
2	WCL Yard	Yards	5	4400	702	13	0	0	Yardmaster	Edit
3	Ridgeway Paint	Spurs	1	110	54	1	0	0	Yardmaster	Edit
4	MB Samuel Packaging	Spurs	1	160	54	1	0	0	Yardmaster	Edit
5	Blue Flame Propane	Spurs	1	90	54	1	0	0	Yardmaster	Edit

Sort by Name ID

My layout locations

All are spurs except for the yard.

Rolling Stock shows current count of cars.

Pickups and Setouts blank while no trains active

BRK Kaolin



Notes

Trailing point switch for West trains.

No runaround, so no East trains.

Defined as 2 "Track"s, could be multiple "Spot"s one day.

Cars

Select	Number	Road	Type	Len	Load	Kernel	Location	Destination	Train	Moves	Set	Edit
<input type="checkbox"/>	1	CSX	HopK	50	E		WCL Yard (Trk2)			4	Set	Edit
<input type="checkbox"/>	1	GRN	Box	50	L		MB Samuel Distribution (Trk1)			6	Set	Edit
<input type="checkbox"/>	2	CSX	HopK	50	L		BRK Kaolin (BRK Trk1)			4	Set	Edit
<input type="checkbox"/>	3	CSX	HopK	50	E		WCL Yard (Trk1)			4	Set	Edit
<input type="checkbox"/>	4	CSX	HopK	50	E		WCL Yard (Trk5)			4	Set	Edit
<input type="checkbox"/>	5	CSX	HopK	50	E		WCL Yard (Trk3)			4	Set	Edit
<input type="checkbox"/>	10146	MDW	Box	50	E		Ridgeway Pain (Ridgeway Paint)			6	Set	Edit
<input type="checkbox"/>	12051	WP	HopK	50	E	WP Kaoli...	WCL Yard (Trk4)			3	Set	Edit
<input type="checkbox"/>	12064	WP	HopK	50	E	WP Kaolin	WCL Yard (Trk4)			3	Set	Edit
<input type="checkbox"/>	12073	WP	HopK	50	E	WP Kaolin	WCL Yard (Trk4)			3	Set	Edit
<input type="checkbox"/>	12085	WP	HopK	50	E	WP Kaolin	WCL Yard (Trk4)			3	Set	Edit
<input type="checkbox"/>	12089	WP	HopK	50	E	WP Kaolin	WCL Yard (Trk4)			2	Set	Edit
<input type="checkbox"/>	12096	WP	HopK	50	E	WP Kaolin	WCL Yard (Trk4)			3	Set	Edit
<input type="checkbox"/>	48240	GK	HopK	50	L		WCL Yard (Trk3)			5	Set	Edit
<input type="checkbox"/>	49219	GK	HopK	50	L		BRK Kaolin (BRK Trk2)			4	Set	Edit
<input type="checkbox"/>	49223	GK	HopK	50	L		BRK Kaolin (BRK Trk1)			4	Set	Edit
<input type="checkbox"/>	190525	TILX	TankG	50	E		Blue Flame Propane (Blue Flam...			6	Set	Edit

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

17 cars

Tips

Avoid redundant Track names.

Don't sweat the road numbers.

Keep types simple.

Kernels keep cars in a "set".

I don't sweat the exact yard tracks.

Cars



Tips

Keep types basic.

Initial location is important.

I identify cars by type, road name, color and current location.

Road numbers must be unique, but I'm ignoring them for N scale.

Add window remains open so you can very easily add multiple nearly identical cars.

Add Car

Window Help

Road

CSX Edit

Road Number

6 Clear

Type

FlatB Edit

Passenger Caboose FRED Utility Hazardous

Length

50 Edit

Location and Track

WCL Yard Trk1 Auto

Optional

Weight

Ounces 1.1 Calculate Auto

Tons 85

Color

Black Edit

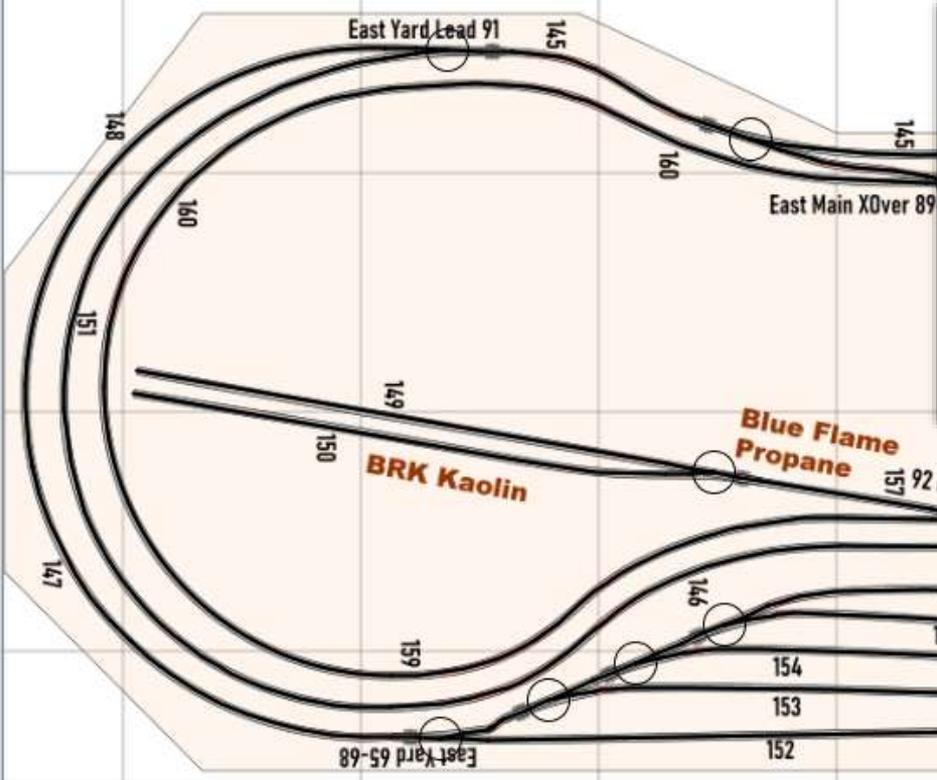
Load

E Edit

Kernel

Delete Add Car Save

Routes



Routes

Tools Operations Window Help

ID	Name	Comment	Shortest...	Max Length	Status	Edit
1	WCL East		1000	1000	OK	Edit
2	WCL West		1000	1000	OK	Edit

Sort by Name ID Add...

Routes

Possible paths that a train can follow, sequences of Locations

Can be 1:1 with Trains, or can be used for multiple Trains

Name

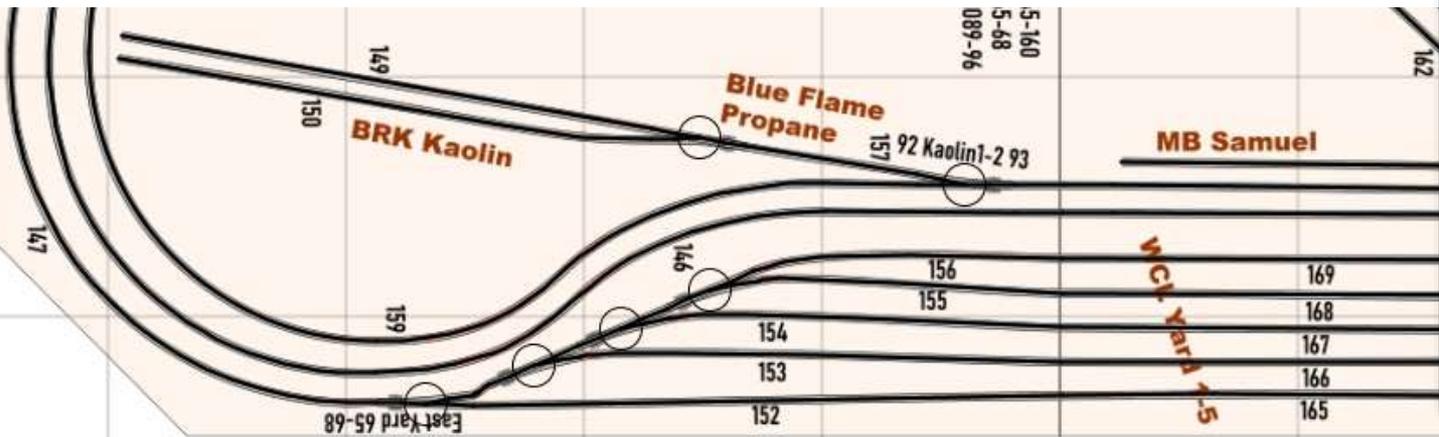
Comment

ID	Location	Train Direction	Moves	Random	Pick ups?	Set outs?	Wait	Max Length	Grade	X	Y	Comment	Up	Down	Delete
----	----------	-----------------	-------	--------	-----------	-----------	------	------------	-------	---	---	---------	----	------	--------

Location Top Middle or Before Selected Row Bottom

Display Wait Departure Time

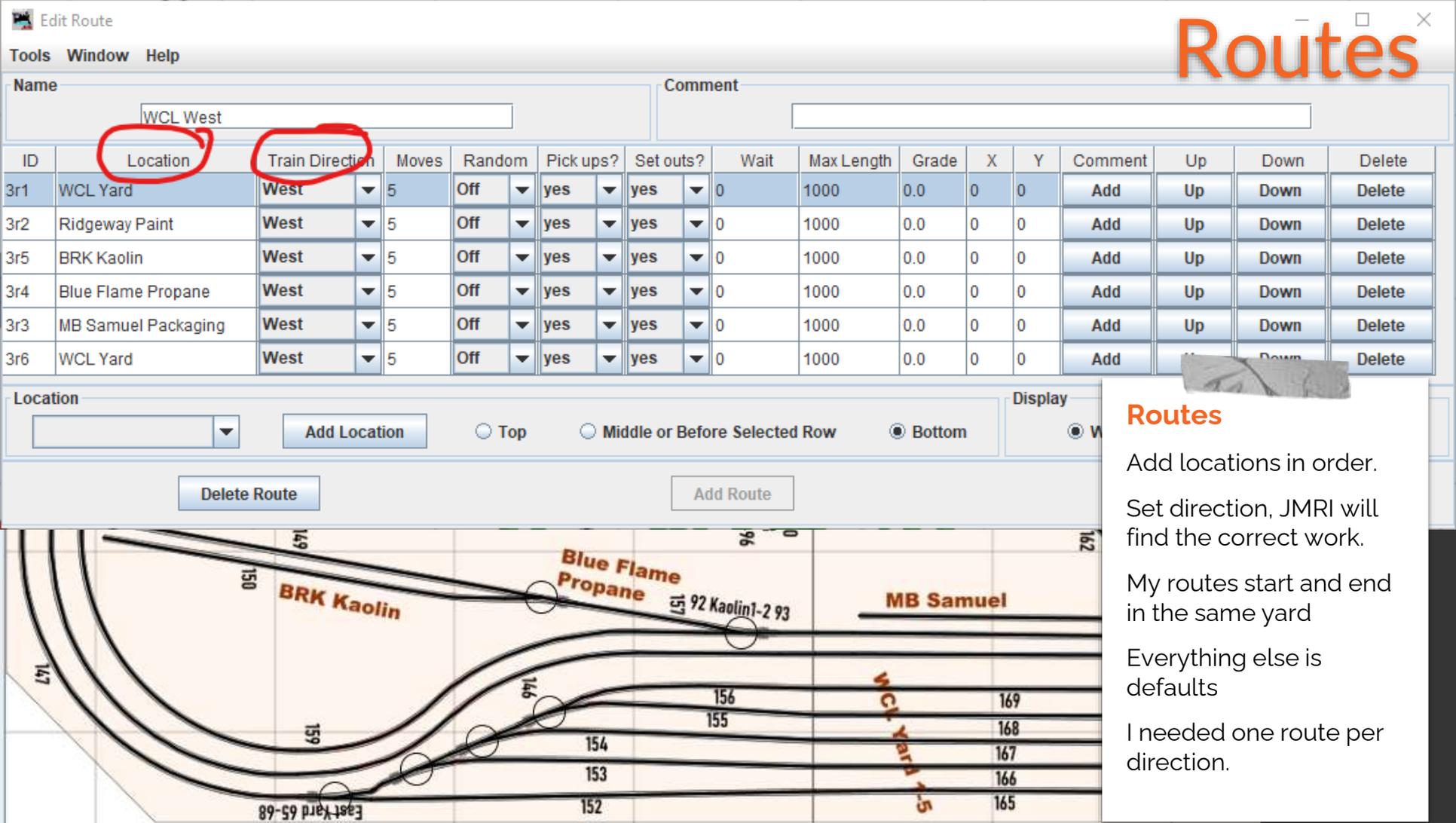
- Blue Flame Propane
- BRK Kaolin



Routes

Select and add each location, in order.

I include all locations train will pass, even if no work, to help operators orient themselves.



Routes

Tools Window Help

Name

Comment

ID	Location	Train Direction	Moves	Random	Pick ups?	Set outs?	Wait	Max Length	Grade	X	Y	Comment	Up	Down	Delete
3r1	WCL Yard	West	5	Off	yes	yes	0	1000	0.0	0	0	Add	Up	Down	Delete
3r2	Ridgeway Paint	West	5	Off	yes	yes	0	1000	0.0	0	0	Add	Up	Down	Delete
3r5	BRK Kaolin	West	5	Off	yes	yes	0	1000	0.0	0	0	Add	Up	Down	Delete
3r4	Blue Flame Propane	West	5	Off	yes	yes	0	1000	0.0	0	0	Add	Up	Down	Delete
3r3	MB Samuel Packaging	West	5	Off	yes	yes	0	1000	0.0	0	0	Add	Up	Down	Delete
3r6	WCL Yard	West	5	Off	yes	yes	0	1000	0.0	0	0	Add	Up	Down	Delete

Location Top Middle or Before Selected Row Bottom Display W

Routes

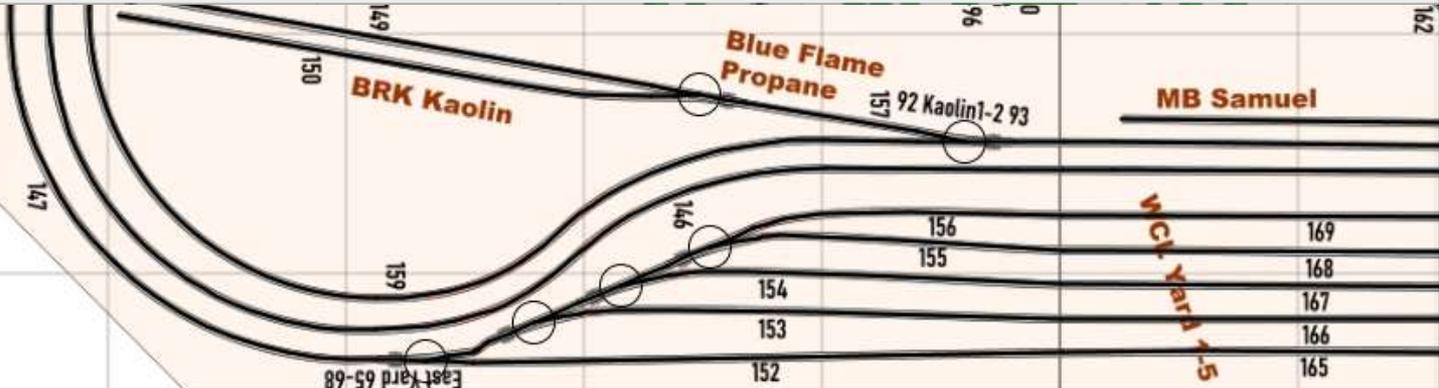
Add locations in order.

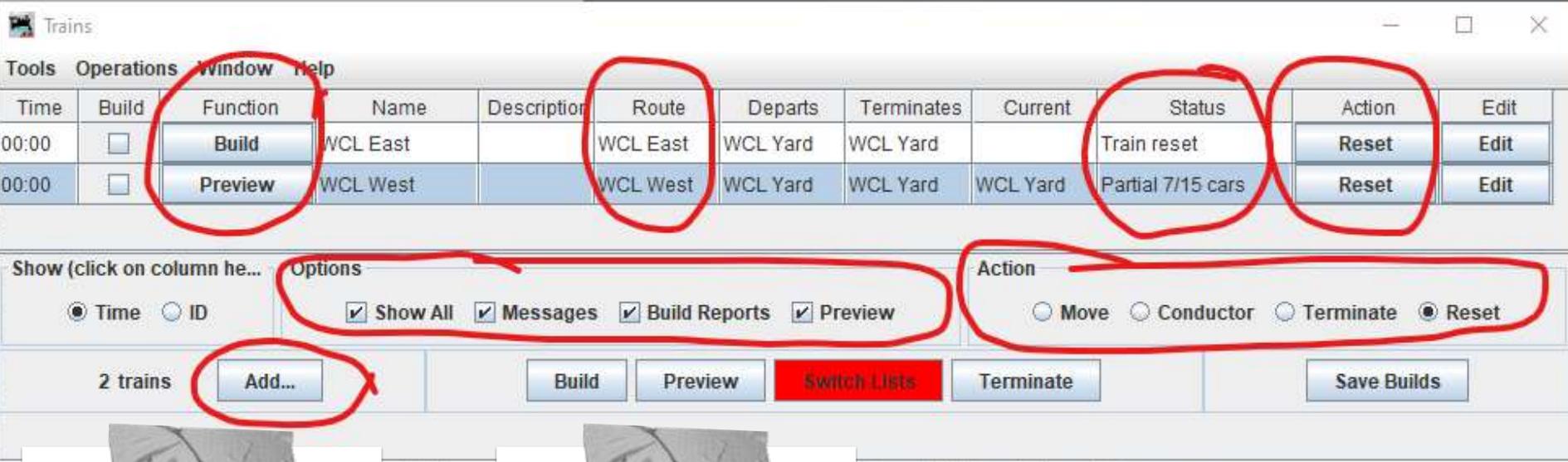
Set direction, JMRI will find the correct work.

My routes start and end in the same yard

Everything else is defaults

I needed one route per direction.





Trains

LOTS going on here!

Check all Options

Each Train has a Route

Function and Action cols change based on Status and Actions

Reset is very useful!

Trains

Build, Preview, Reset, Improve until you get it right (more later...)

Trains

The screenshot shows the 'Add Train' window with the following fields and options:

- Name:** WCL West Looper
- Description:** Matthew Special
- Departure Time (hh:mm):** 00:00
- Route:** WCL West Looper
- Locations:** WCL Yard, Ridgeway Paint, BRK Kaolin, Ridgeway Paint, Blue Flame Propane, Ridgeway Paint, MB Samuel Packaging, WCL Yard
- Select car types serviced by this train:** Box, FlatB, Gon, HopK, TankG
- Select locomotive types serviced by this train:** Diesel
- Optional train requirements:** Locus: 0, Model: [empty], Road: [empty]
- Comment:** [empty]

Buttons at the bottom: Delete Train, Reset Train, Add Train, Save Train



Add Train

Enter Name and click Add Train....

Must select a Route

I leave other stuff default for now

Remember Ridgeway Paint is East only

Use this to make your Trains unique (later!)

Trains

Tools Operations Window Help

Time	Build	Function	Name	Description	Route	Departs
00:00	<input type="checkbox"/>	Build	WCL East		WCL East	WCL Yard
00:00	<input type="checkbox"/>	Preview	WCL West		WCL West	WCL Yard
00:00	<input type="checkbox"/>	Build	WCL West Loo...	Matthew Special	WCL West ...	WCL Yard

Show (click on column heading to s... Options

Time ID

Show All Messages Build Reports

3 trains

- 1 - June 28, 2020 8:43 PM

Waccamaw Coast Line

Manifest for train (WCL West)
Valid 6/28/2020 20:07

Scheduled work at WCL Yard, departure time 00:00

- [] Pick up CSX 1 HopK Tan from Trk2
- [] Pick up CSX 4 HopK Tan from Trk5
- [] Pick up CSX 3 HopK Tan from Trk1
- [] Pick up CSX 5 HopK Tan from Trk3
- [] Pick up GK 48240 HopK Tan from Trk3

Train departs WCL Yard Westbound with 5 cars, 270 feet, 488 tons

No work at Ridgeway Point

Scheduled work at BRK Kaolin, arrival time 00:08

- [] Set out CSX 1 HopK Tan to BRK Trk1
- [] Set out CSX 4 HopK Tan to BRK Trk1
- [] Set out CSX 3 HopK Tan to BRK Trk2
- [] Set out CSX 5 HopK Tan to BRK Trk2
- [] Set out GK 48240 HopK Tan to BRK Trk2

Train departs BRK Kaolin Westbound with 0 cars, 0 feet, 0 tons

Scheduled work at Blue Flame Propane, arrival time 00:27

- [] Pick up TILX 190525 TankC Black from Blue Flame Propane

Train departs Blue Flame Propane Westbound with 1 cars, 54 feet, 28 tons

Scheduled work at MB Samuel Packaging, arrival time 00:34

- [] Pick up GRN 1 Box Green from Trk1

Train departs MB Samuel Packaging Westbound with 2 cars, 108 feet, 96 tons

Scheduled work at WCL Yard, arrival time 00:41

- [] Set out TILX 190525 TankC Black to Trk1
- [] Pick up GRN 1 Box Green to Trk2

Train terminates in WCL Yard

Build and Preview

Build, then use Preview to view results

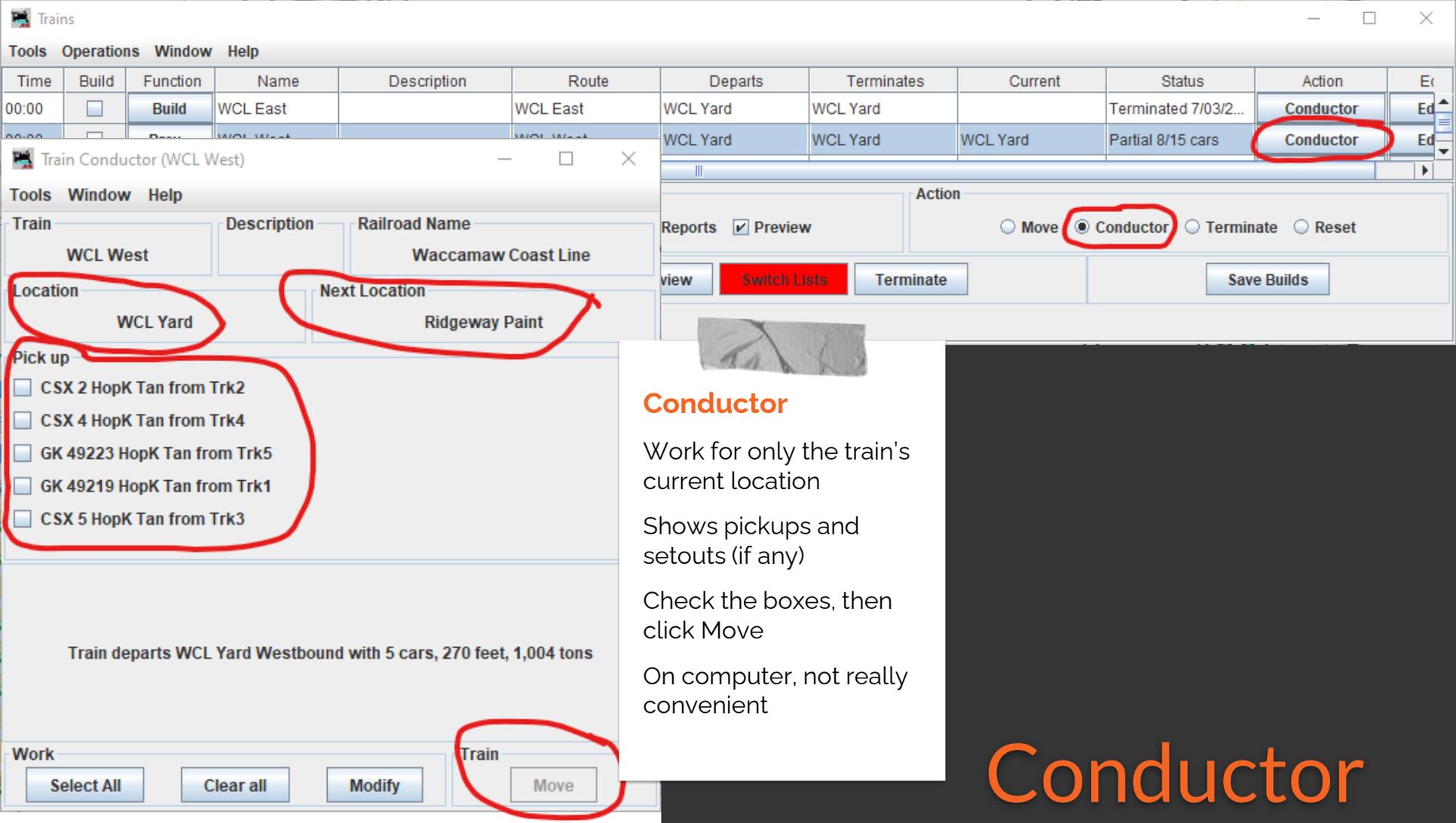
Red is Pickups, Blue is Set Outs, a Location could have both

Starting location is all Pickups, Terminate is all Set Outs

If you don't like results, Reset, Change, retry

Print Manifest

Paper people will print this Manifest for their operators



Conductor

Work for only the train's current location

Shows pickups and setouts (if any)

Check the boxes, then click Move

On computer, not really convenient

Conductor

JMRI Web Server

Web access to many cool features from another computer, tablet or phone.

Menu at the top.

Panel access is great, but we won't cover it.

Edit, Preferences, Start Up, Add, Perform Action, Start JMRI Web Server

Waccamaw Coast Line [Panels](#) [Roster](#) [Operations](#) [Tables](#) [Preferences](#) [Help](#)

Waccamaw Coast Line

Welcome to *Waccamaw Coast Line*, powered by [JMRI](#).

Throttles

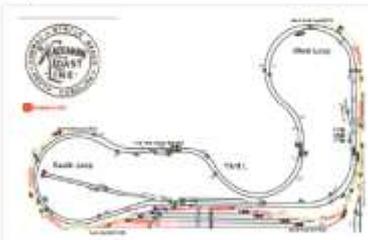
[webThrottle](#)
webThrottle provides integrated support for controlling trains, layout elements, and panels from a web browser.
[Open Now >](#) [Learn More >](#)

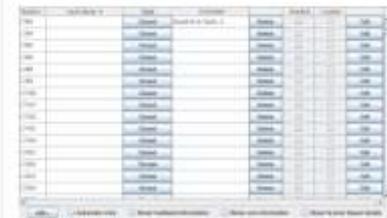
[Engine Driver](#)
Engine Driver is a native throttle for Android-powered phones and tablets.
[Learn More >](#)

[WiThrottle](#)
WiThrottle is a native throttle for the iPhone, iPad, and iPod.
[Learn More >](#)

[DigTrainsPro](#)
DigTrainsPro is a versatile and user friendly model railroad control app. For Android, IOS, and Windows 10.
[Learn More >](#)

Open Windows


Waccamaw Coast Line


Turnout Table

Utilities

[JSON Console](#)
The JSON Console is disabled. [x](#)
A console for directly issuing JSON commands to JMRI.

[Simple Console](#)
The Simple Console is disabled. [x](#)
A console for issuing plain text commands to JMRI.

[File Access](#)
Directly access certain files and directories:
[/prefs](#)
The preferences directory for the current JMRI profile.
[/dist](#)
The JMRI application installation directory
[/web](#)
Some web applications, and files required for the web server.
[/images](#)

JMRI Web Server

Name**Description****Lead Engine****Departs****Time****Status**

WCL West ▾

Manifest

Conductor

WCL Yard 00:00 Partial 8/15 cars

Operations, Trains

Access from tablet or phone

Shows only built trains

Select Manifest or Conductor

Manifest good for overview of train's work

WCL West () Manifest

Valid 7/08/2020 19:24

Scheduled work at WCL Yard, departure time 00:00

 Pull CSX 2 HopK Tan from Trk2 Pull CSX 4 HopK Tan from Trk4 Pull GK 49223 HopK Tan from Trk5 Pull GK 49219 HopK Tan from Trk1 Pull CSX 5 HopK Tan from Trk3

Train departs WCL Yard Westbound with 5 cars, 270 feet, 1004 tons

No scheduled work at Ridgeway Paint

Scheduled work at BRK Kaolin, arrival time 00:08

 Spot CSX 2 HopK Tan to BRK Trk1 Spot CSX 4 HopK Tan to BRK Trk1 Spot GK 49223 HopK Tan to BRK Trk1 Spot GK 49219 HopK Tan to BRK Trk2 Spot CSX 5 HopK Tan to BRK Trk2

Train departs BRK Kaolin Westbound with 0 cars, 0 feet, 0 tons

Scheduled work at Blue Flame Propane, arrival time 00:27

 Pull TILX 190525 TankG Black from Blue Flame Propane

Train departs Blue Flame Propane Westbound with 1 cars, 54 feet, 85 tons

Scheduled work at MB Samuel Packaging, arrival time 00:34

 Pull SCL 5302 Box Black from Trk1 Pull MDW 10146 Box Green from Trk1

Train departs MB Samuel Packaging Westbound with 3 cars, 162 feet, 198 tons

Scheduled work at WCL Yard, arrival time 00:44

 Spot SCL 5302 Box Black to Trk1 Spot MDW 10146 Box Green to Trk2 Spot TILX 190525 TankG Black to Trk5

Train terminates in WCL Yard

Conductor

Shows work for the train's current location (only)

Shows pickups and setouts (if any)

On a tablet, really convenient

Check the boxes, then click Move

All and Clear buttons

Move updates JMRI train and car locations immediately

Waccamaw Coast Line

Panels ▾

Roster ▾

Operations ▾

WCL West () Conductor

WCL Yard Next Location: Ridgeway Paint

Scheduled work at WCL Yard, departure time 00:00

Train departs WCL Yard West with 5 cars, 270 feet, 1004

Pick up

- CSX 2 HopK Tan from Trk2
- CSX 4 HopK Tan from Trk4
- GK 49223 HopK Tan from Trk5
- GK 49219 HopK Tan from Trk1
- CSX 5 HopK Tan from Trk3



Move to Ridgeway Paint

WCL West () Conductor

WCL Yard

Scheduled work at WCL Yard

Train terminates in WCL Yard

Set out

- SCL 5302 Box Black to Trk1
- MDW 10146 Box Green to Trk2
- TILX 190525 TankG Black to Trk5



Terminate

Web Conductor

Two Devices

One operator "Conductor" uses Conductor on tablet or phone full-screen

Other operator "Engineer" uses separate phone to run EngineDriver or WiThrottle

Or "Engineer" can use old-school hardware throttles with the knobs and such

One Device - Two Screens

Throttle on one screen

Conductor on another

Use AutoWeb (rotation) to toggle view

-OR-

use menu to toggle view

One Device - Split Screen

Throttle at the top

Web page for Conductor at the bottom

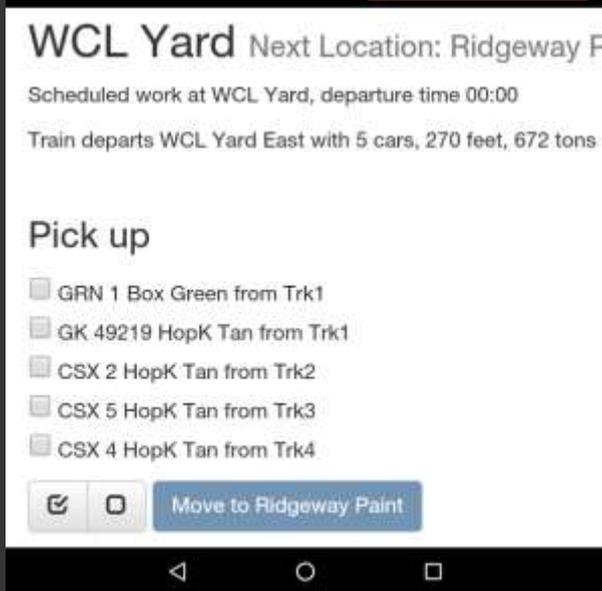
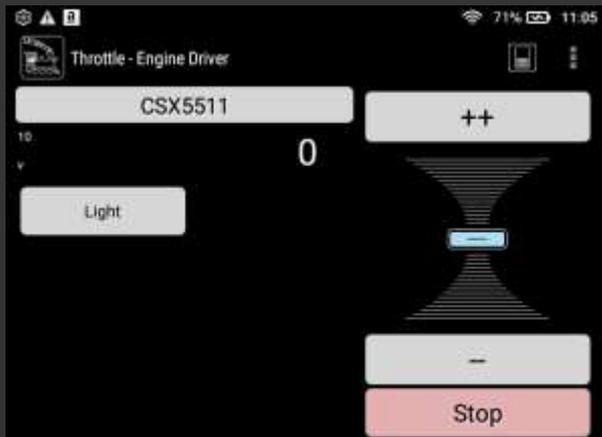
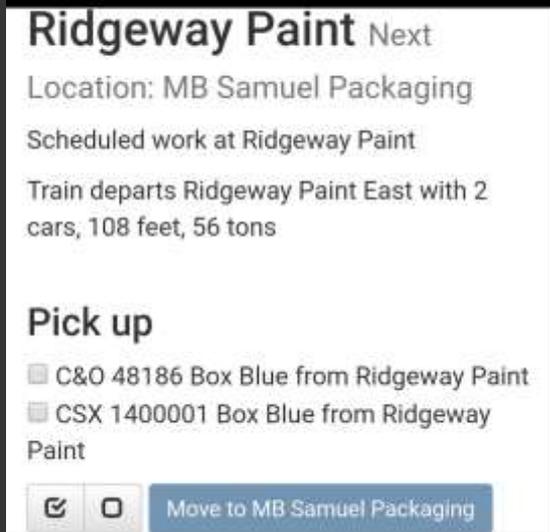
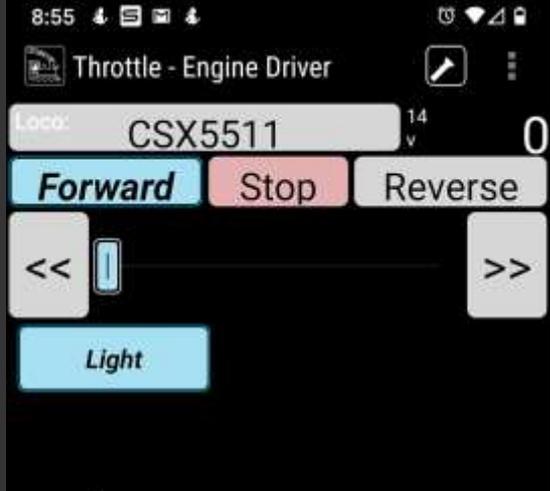
"Gamepad" plus

EngineDriver Web View for Conductor on phone or tablet

Use a gamepad on a lanyard to control the train



Conductor Options



Conductor

If 2 operators, one uses Conductor full-screen, 2nd runs EngineDriver

If one operator, use EngineDriver's Throttle Web View to split the screen

OR use AutoWeb to go back and forth between Conductor and Throttle

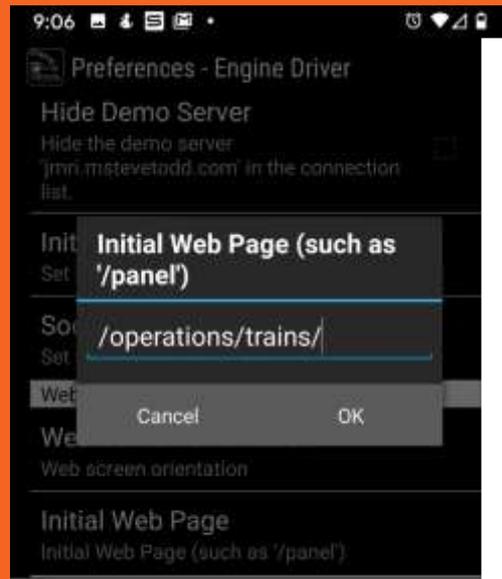
Web Conductor



Preferences

For split screen:
Throttle Web View =>
Bottom

Initial Throttle Web Page
=> **/operations/trains/**"



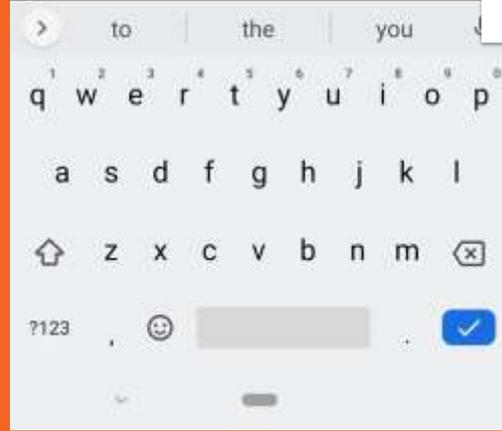
Preferences

For full screen:
Initial Web Page =>
"/operations/trains/"

Screen Orientation =>
AutoWeb

-OR-

Just use the Web menu
option

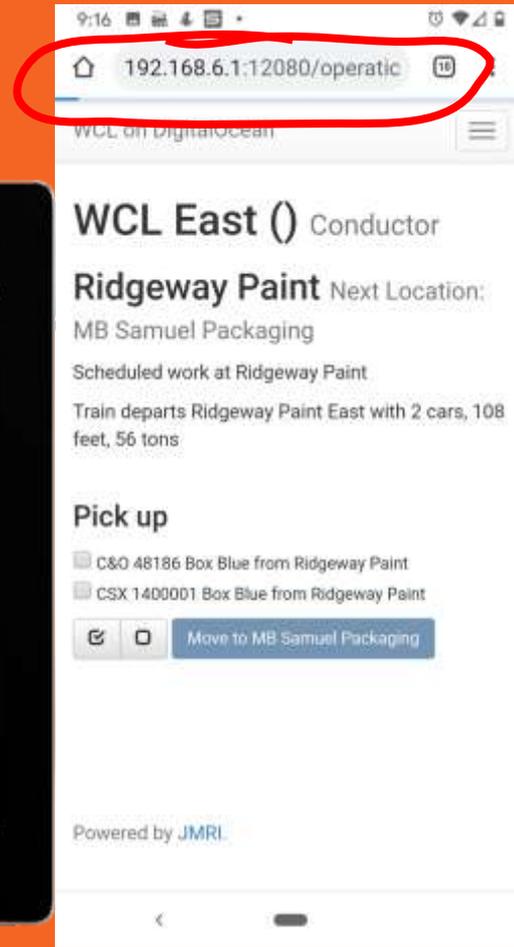
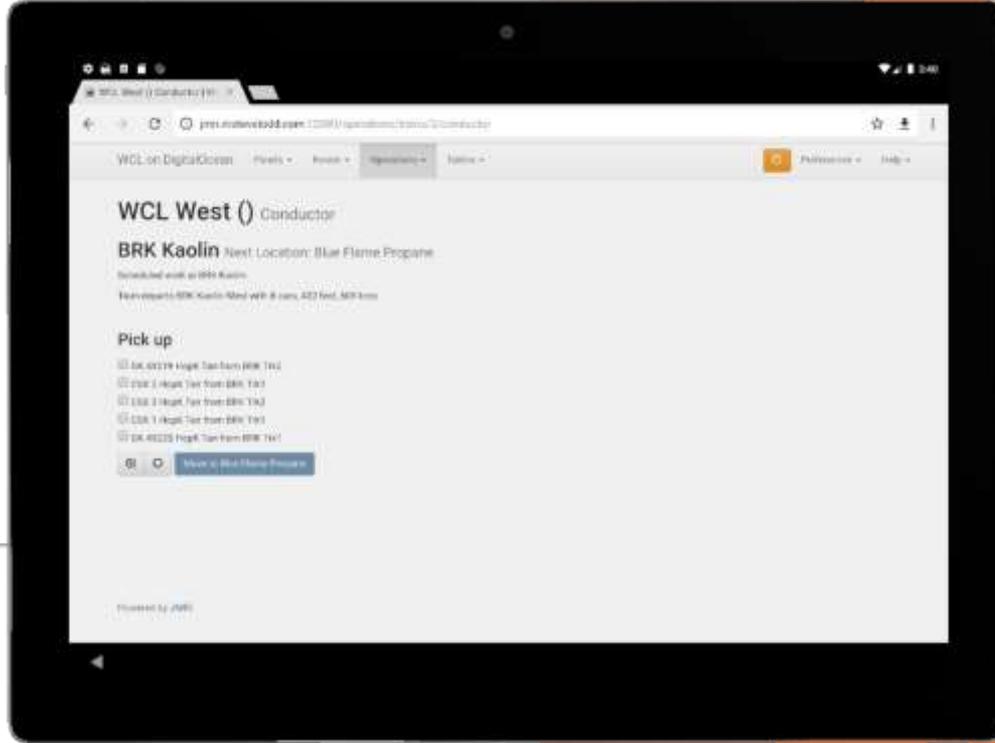


EngineDriver Preferences

Web Browsers

EngineDriver or Withrottle is **NOT** required to access the JMRI web pages

Enter web server address and port (12080) into phone or tablet's browser (Chrome, FireFox, Safari, etc.)



Web Browsers

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Live demo

|

Live Demo!



Recap

- **Start very simple, see -->**
- **Trains**
Build, Preview, Reset, Change,
Repeat until you get it right
- **Use Conductor on phone or tablet**
Split screen, full screen toggle, or
two devices
- **Conductor updates location**
As soon as you press [Move] or
[Terminate],
- **Conductor uses current location**
Refresh screen for updates



Add one or two of each to begin:

1. Locations
 - a. Tracks
2. Cars
3. Routes
4. Trains

But what about...

→ **Misplaced cars!**

Just fix location using JMRI and refresh the Conductor window

→ **This car didn't go where I wanted it to**

Find car in the Detailed Build report

Next steps for me

1. Merge Propane and BRK
2. Add more cars
3. Create a "Back to Yard" route and train
4. Adjust track lengths
5. Perfect couplers and trackage
6. Add more industries

ED improvements

1. Adjustable split for Throttle Web View
2. Horizontal Shunting Throttle (*DONE*)
3. Add Web to Fling (*DONE*)



Questions??

→

→

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