

USING SMARTPHONES AND TABLETS FOR THROTTLES AND PANELS WITH JMRI

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Outline

- ◉ Why use Smartphones and Tablets
- ◉ Basic Requirements
- ◉ Throttles
- ◉ Panels
- ◉ Operations
- ◉ JMRI setup for WiFi and Web
- ◉ Frame Server vs Client Panel
- ◉ What's next in EngineDriver
- ◉ Optional: Networking basics

About Robin Becker

- Junior developer of EngineDriver
- Developer of Quad-LN: *LocoNet® stationary decoder*
- JMRI user and contributor since early days
- N-scale modeler
- *25 years on SD&A Railway including 13 years as Engineer*
- Career in microprocessor-based instrumentation
- Principal of N3IX Engineering

Who are you?

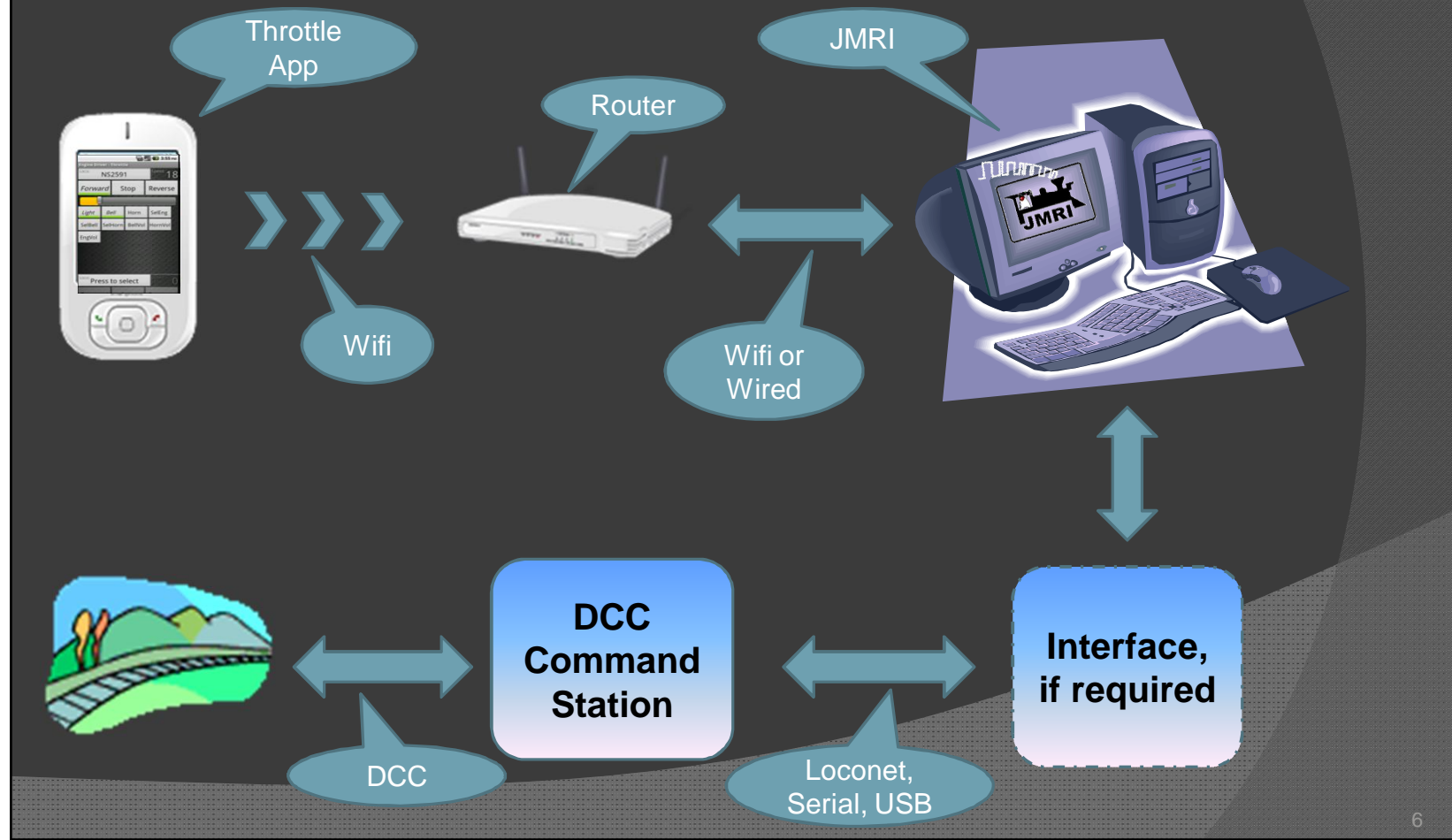
- Use DCC?
- Use JMRI DecoderPro to program decoders?
- Use JMRI Panels? Created?
- Use JMRI Operations?
- EngineDriver or WiThrottle apps?
- InControl Web throttle?
- Accessed JMRI windows via browser?
- Controlled turnouts or routes via ED or WiT?
- Used web features of ED or WiT apps?
- Know frameserver vs. panelserver?

Why Smartphone or Tablet?

- Replace expensive hardware throttles with existing smartphones
- Better user interface. Lower learning curve for new (younger) operators
- Replace physical panels with flexible software
- Replace operations paperwork with software (can update real-time)

Basic Setup

- Computer running JMRI
- Connection to layout
- Local wireless network – WiFi
- WiFi-enabled device(s)

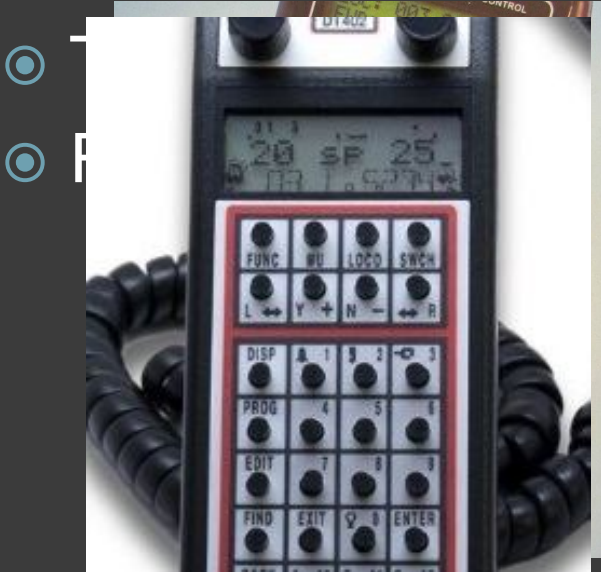


Faceless. Huh?



Throttles

- Control engines - the starting point
- End the “what address is that loco” era
- End the “which function does what” era



Available Throttles

- ⦿ Android - Engine Driver
- ⦿ iPhone, etc. – WiThrottle app

Dedicated applications

Connect to the JMRI “WiThrottle” server

- ⦿ Web Browser – InControl web app

Uses built-in browser instead of separate application

Connects to the JMRI “Web” Server

EngineDriver Throttle Screen

3G 3:55 PM

Engine Driver - Throttle

Loco: NS2591 Speed: 18

Forward Stop Reverse

Light Bell Horn SelEng

SelBell SelHorn BellVol HornVol

EngVol

Loco: Press to select Speed: 0

3G 3:56 PM

Engine Driver - Throttle

Loco: NS2591 +NS2608 +NS4805 Speed: 10

Forward Stop Reverse

Light Bell Horn SelEng

SelBell SelHorn BellVol HornVol

Loco: 3(S) Speed: 14

Forward Stop Reverse

Light Bell Horn 3

4 5 6 7

EngineDriver Turnouts and Routes

3G 3:59 PM

Engine Driver - Turnouts

Control Turnouts

L Throw Close Toggle

LT10	Coal Prep Entry	Thrown
LT11	Coal Prep Exit	Thrown
LT12	Coal Prep Siding	???
LT13	Mountain Line Entry	Closed
LT14	Lower Mountain Siding	Thrown
LT15	Coal Reverse Loop	Closed
LT16	Coal - Off Layout - DO NOT USE	???

3G 4:00 PM

Engine Driver - Routes

Control Routes

R Set

IR:AUTO:0007	West Yard 4	Inactive
IR:AUTO:0009	West Yard 3	Active

EngineDriver Select Loco from Roster

Engine Driver - Select Loco

Currently Selected Locos

Not Set Release CSX754 Release

Enter Locomotive Address to Acquire

Short

-OR- Select from Roster/Consist Entries

88(S)
2591+2608+4805

127(S)
6318+754

6318(L)
CSX6318 

754(L)
CSX754 

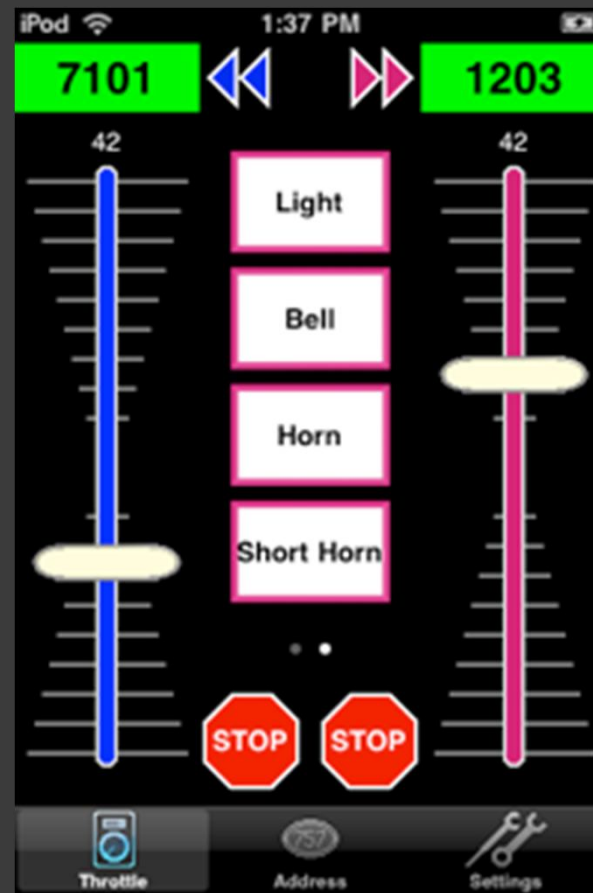
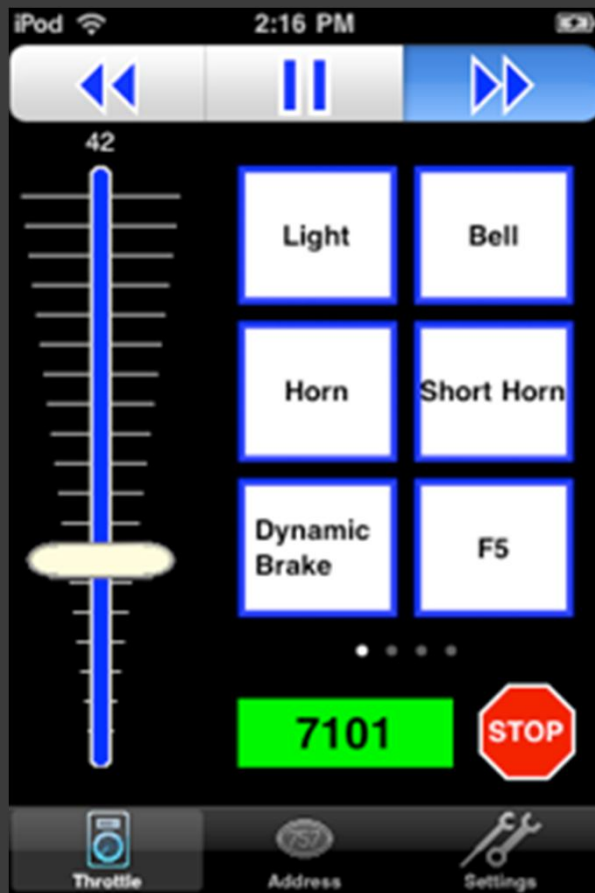
8969(L)
CSX8969

2591(L)
NS2591 

2608(L)
NS2608 

Throttle Name: Engine Driver 0650
WiThrottle: v2.0 Heartbeat: 8 secs

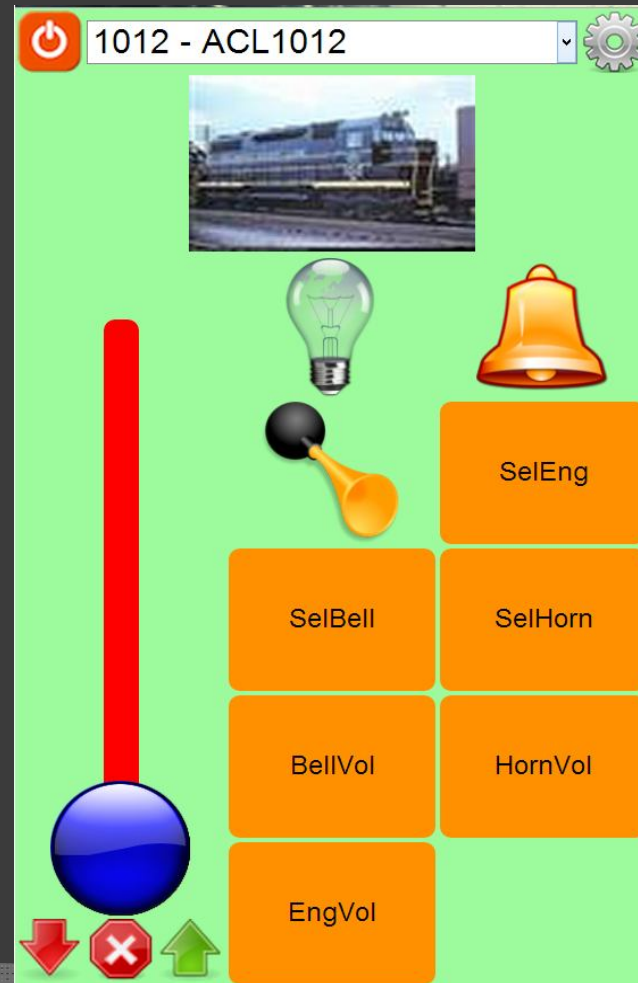
WiThrottle Throttle Screen



WiThrottle Select Loco from Roster



InControl WebThrottle



Panels

- Use web browser
- Connect to the JMRI “Web” Server

JMRI Web Server Home Page

Waccamaw Coast Line



This is the default front page for JMRI application web access.

Note: turn on "Rebuild index.html?" in Web Server Preferences to rebuild this page after upgrading JMRI.

For more information, refer to [JMRI Web Server Help](#) (also [on the web](#)).

For details about the server, refer to [Details of the JMRI web server](#)

JMRI Help

- [Introduction](#)
- [Table of Contents](#)
- [Index](#)

Local [signal definitions](#).

Open Windows

Frame	Thumbnail
Waccamaw Coast Line	

Available as a [separate list](#). [FrameServlet Help](#)

Client-side Panels

View Panel	Type
Waccamaw Coast Line	Layout

Available as a [separate list](#). [showPanel.html Help](#)

Note: This feature is still under development. Feedback is appreciated.

Roster

- [Complete Roster](#)
- [Simple Roster](#)
- [Roster without groups](#)
- [Roster groups](#)

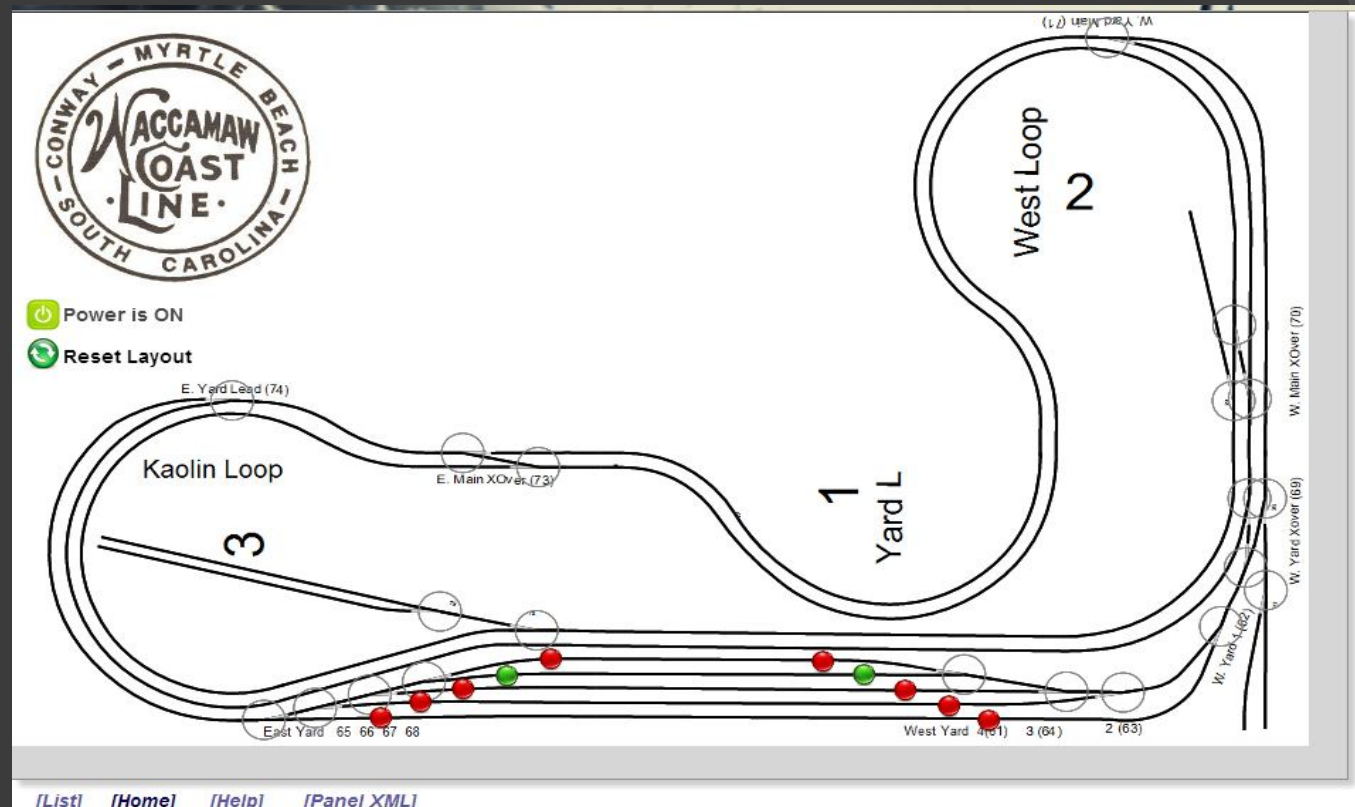
Clicking or tapping on a roster entry opens an *inControl* web throttle in any of these lists.

File Access

Direct access to certain files and directories:

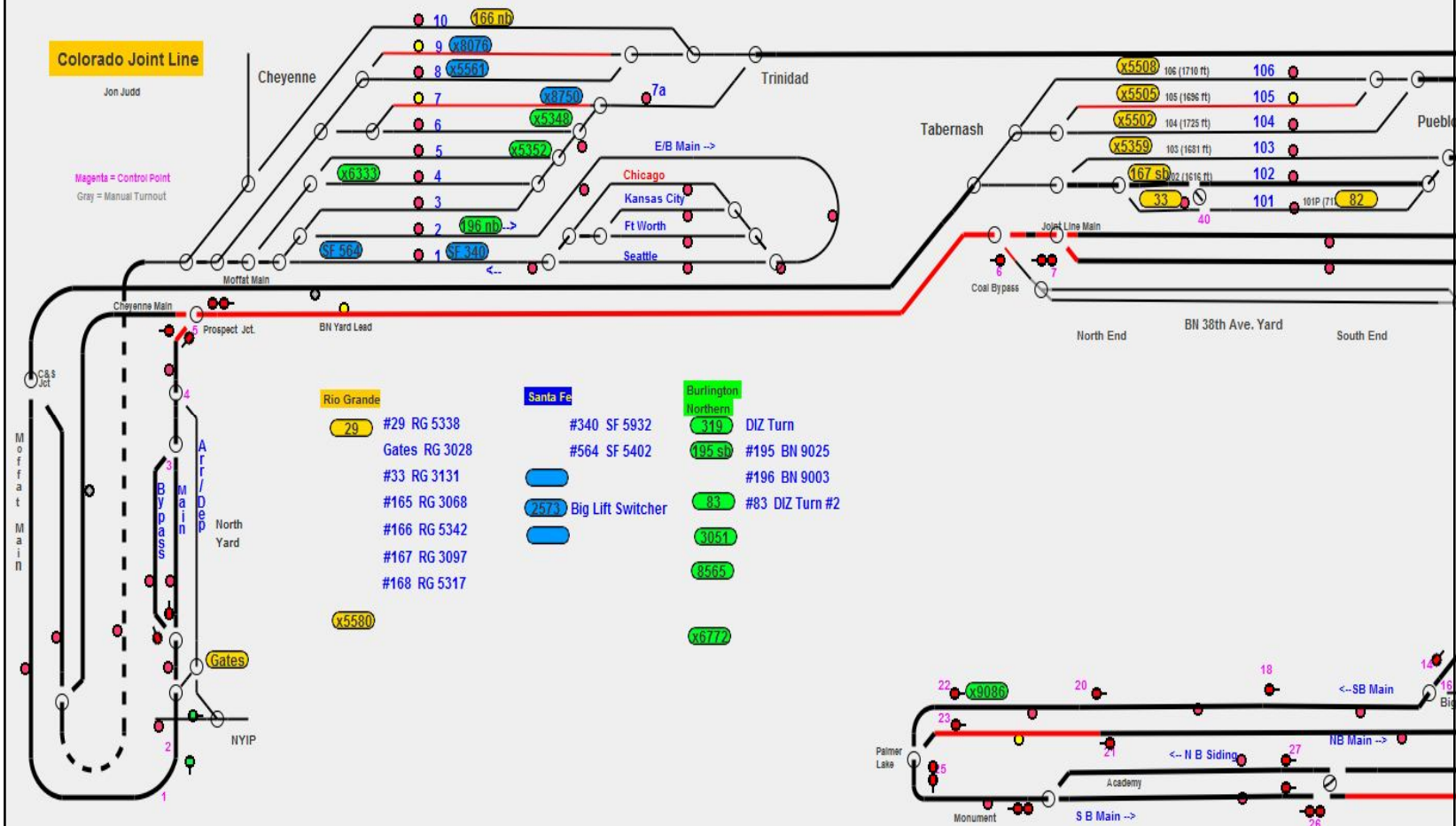
- [/prefs/](#) (The JMRI preferences directory)

Steve Todd's Layout Panel



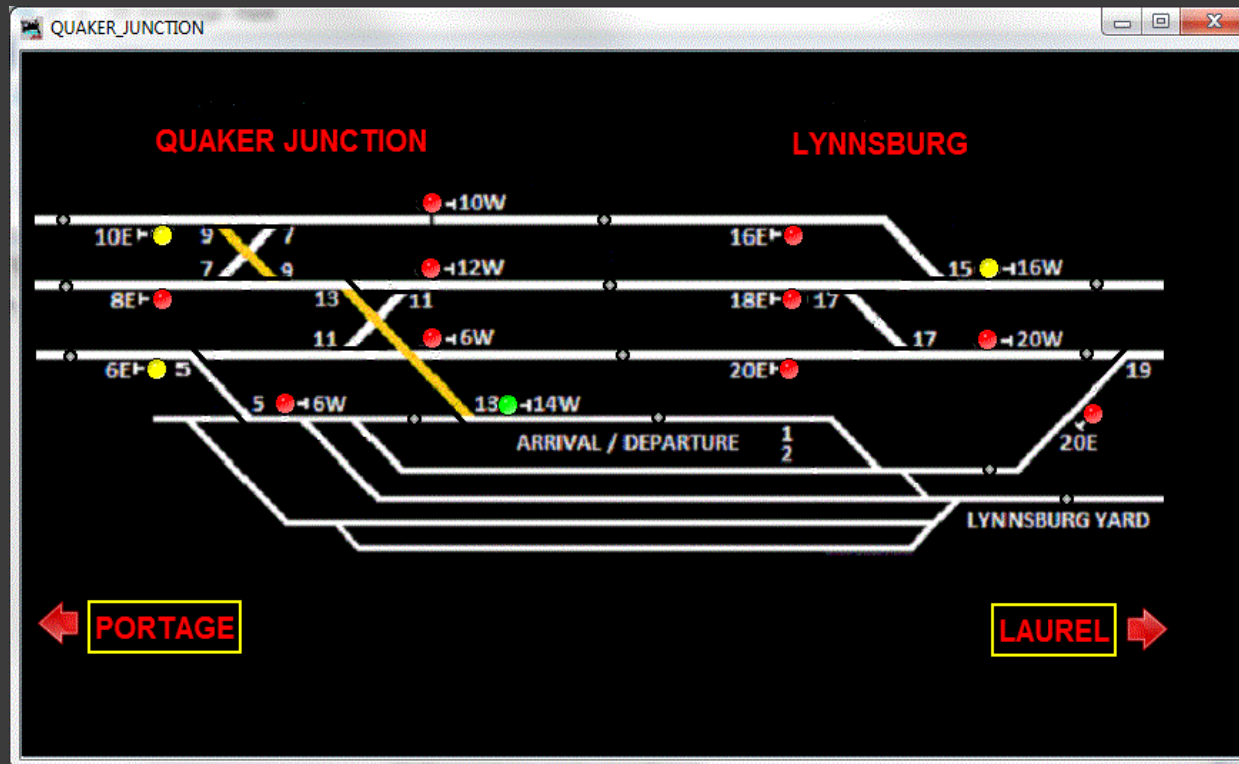
Note larger circles, routes, power. Fits nicely on tablets.

Jon Judd's Colorado Joint Line



Signals, Occupancy detectors, Localcons, really needs a large monitor

Tablet-Sized Panel using new Link feature to navigate the layout.

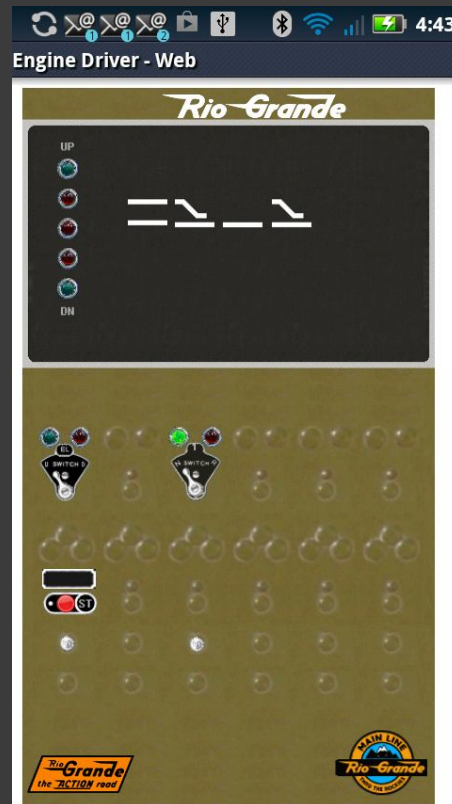


<http://quaker-valley.com/CTC/Tablet.html>

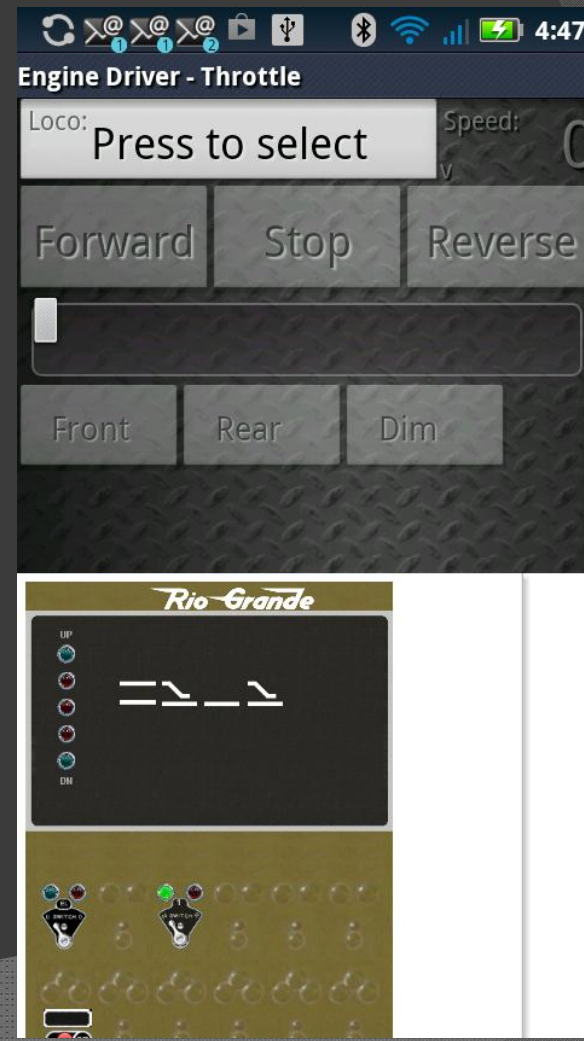
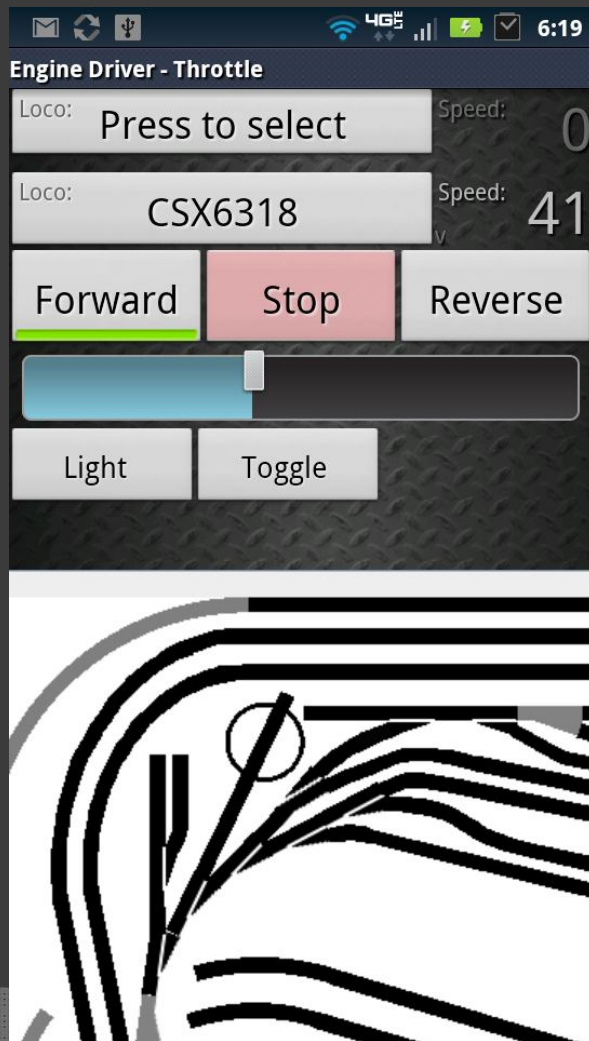
Smartphone panels too! My Elevator Control Panel on EngineDriver Web screen

CTC type panel

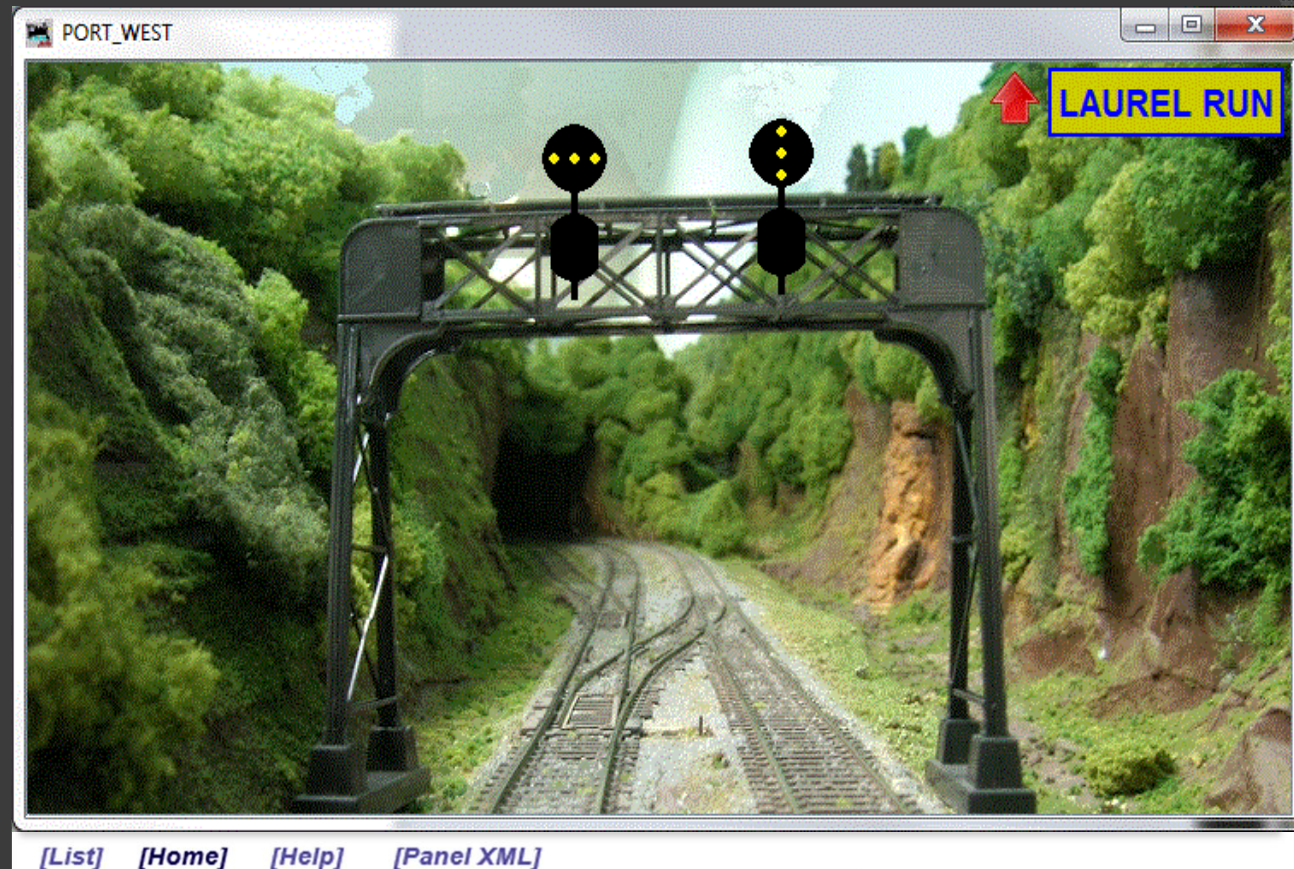
Fits nicely on
smartphone.



EngineDriver Throttle with Panel



“Engineer view”



Signals are live, arrows open the “next” panel

Operations

- Use JMRI Operations capability
- Eliminate paper

Train Manifest as web page

Train Manifest | LS Lakeview - Susanville | Waccamaw Coast Line

LS Lakeview - Susanville - *Staging to staging*

- ⊕ Lakeview (07:20) 15 pickups
 - Farmington (07:24) No work
 - Hillsboro (07:28) No work
- ⊕ Danville (07:32) 1 setouts
- ⊖ Port Arthur (07:39) 3 pickups 2 setouts
 - ✓ Set out PRR 81368 Boxcar 40' Tuscan E<empty> to #153 Zane Mercantile
 - Set out N&W 54818 Boxcar 50' Tuscan L<oad> to #427 Majestic HW & Feed
 - ✓ Pick up G&F 442 Boxcar 50' Jade Green L<oad> from #153 Zane Mercantile
 - Pick up GRCX 5020 TankOil 33' Blue E<empty> from #163 Siding
 - Pick up SR 40204 Boxcar 50' Tuscan L<oad> from #47 Farmer's Yard
- ⊕ Bakersfield (07:58) 3 pickups 3 setouts
- ⊕ Fremont (08:20) 3 setouts
- ⊕ Susanville (08:33) 12 setouts

[\[Trains\]](#) [\[Home\]](#) [\[Help\]](#)

Locations expand, click to mark complete

Conductor Window as web page

Train Conductor (LS)

Tools Window Help

Train	Description	Railroad Name
LS 5162	Lakeview - Susanville	JMRI Operations Demo Railroad

Train Comment

Staging to staging

Location	Next Location
Port Arthur	Bakersfield

Pick up

- ☐ SR 40204 Boxcar 50' Tuscan L<oad> from #47
- ☒ G&F 442 Boxcar 50' Jade Green L<oad> from #
- ☐ GRCC 5020 Tank Oil 33' Blue F<empty> from #16

Set out

- ☒ PRR 81368 Boxcar 40' Tuscan E<empty> to #153
- ☐ N&W 54818 Boxcar 50' Tuscan L<oad> to #427

Train departs Port Arthur Westbound with 13 cars, 747 feet, 922 tons

Work

Select all Clear all Set

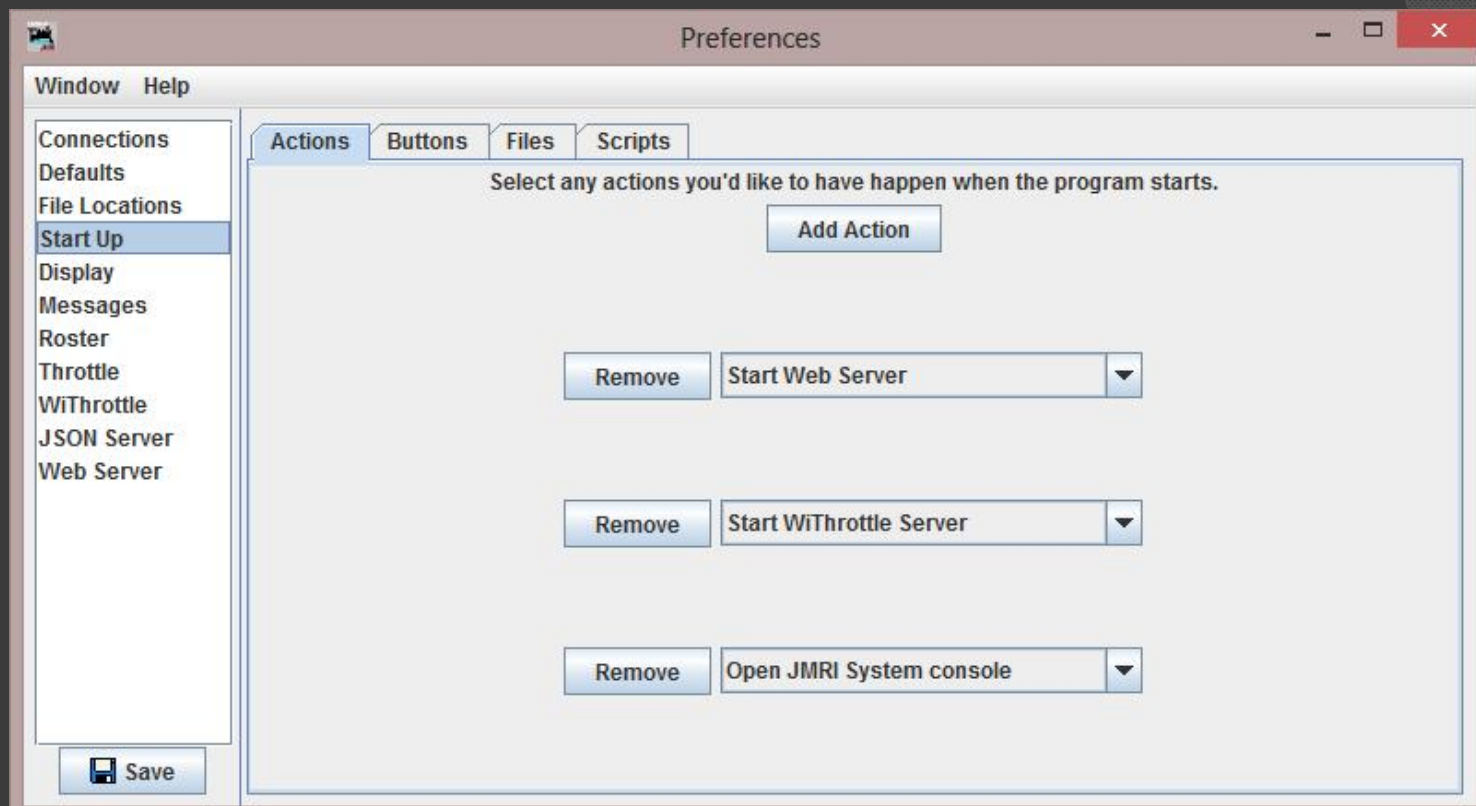
Train

Move

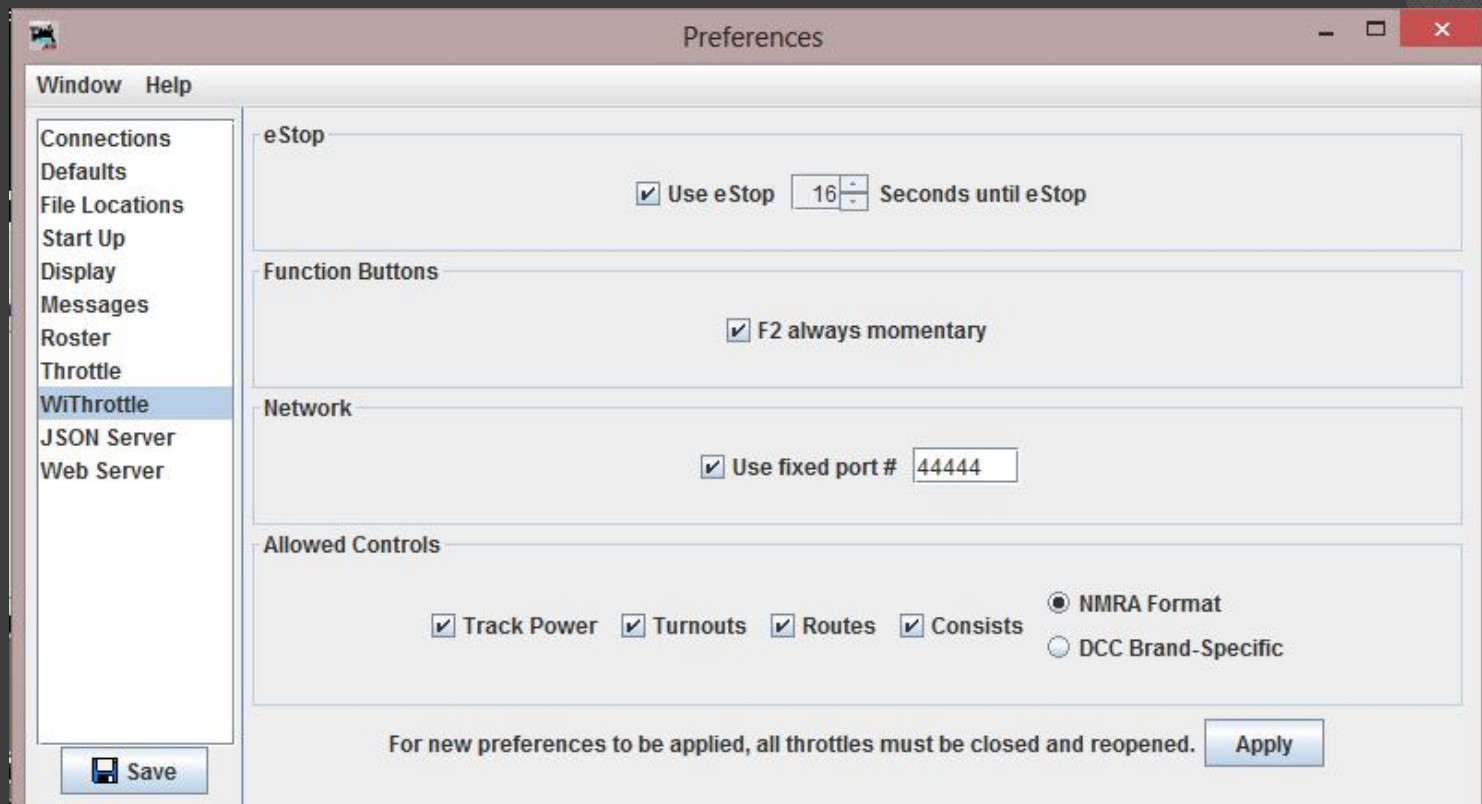
Configuring JMRI

- ◉ WiThrottle Server
- ◉ Web Server

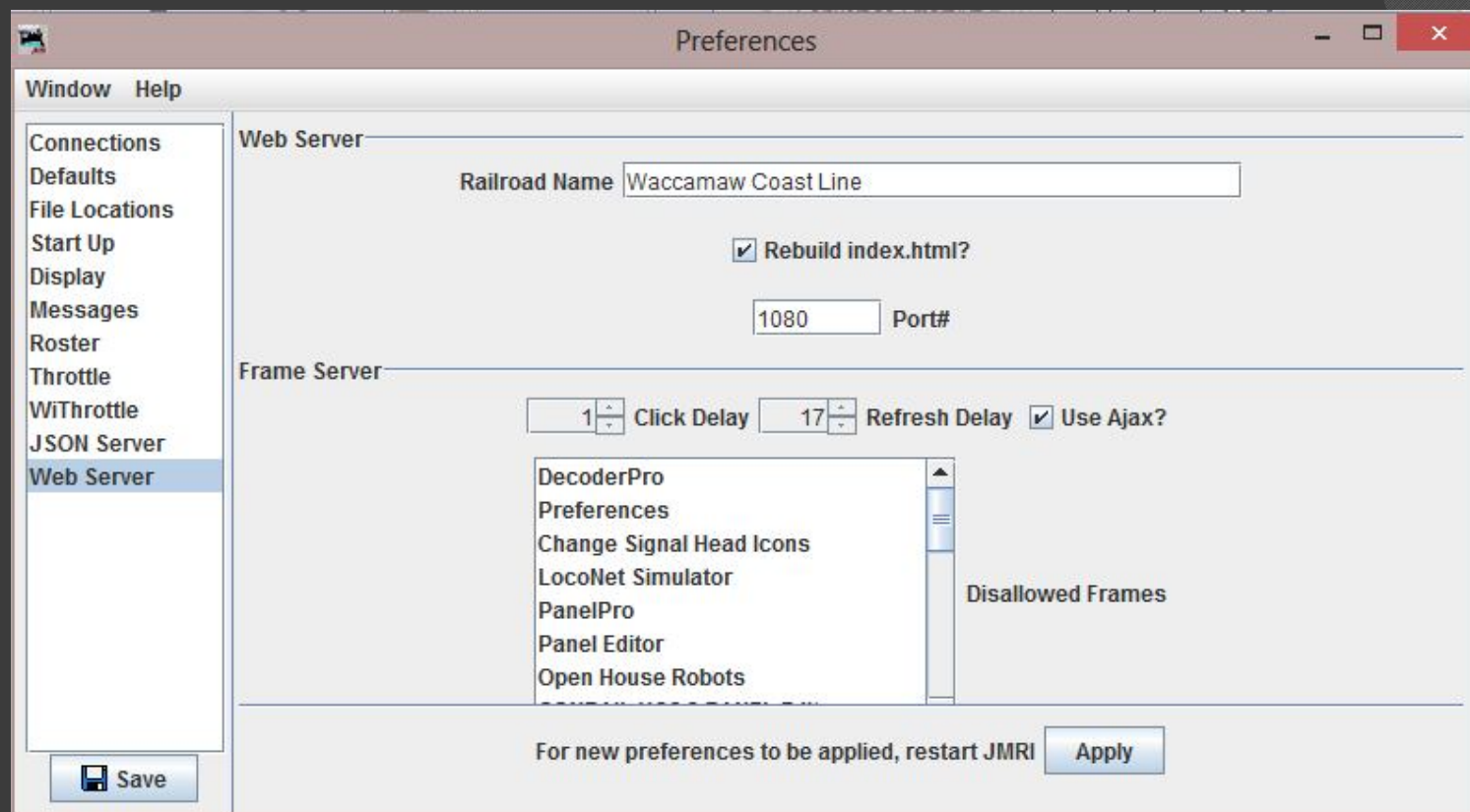
Starting Servers



WiThrottle Server Preferences





Web Server Preferences



Cutting Edge: Frame Server vs. Client Panel

Open Windows

Frame	Thumbnail
Waccamaw Coast Line	
Train Conductor (BLX)	

Available as a [separate list](#). [FrameServlet Help](#)

Client-side Panels

View Panel	Type
Waccamaw Coast Line	Layout

Available as a [separate list](#). [showPanel.html Help](#)

FrameServer vs. Client Panel

“Open Windows” = frameserver

- Works with most JMRI windows
- Periodic refresh
- Sends image of entire window
- Mouse clicks only (no text entry, sliders, etc.)

“Client-side Panels” = showPanel.js

- Panels only
- Sends widget states only (much faster)
- Direct widget refresh on changes
- “knows” about the widgets (e.g. Links, text entry, etc.)

Live Demo

- ◉ Frame Server
- ◉ Client Panel
- ◉ Web Throttle

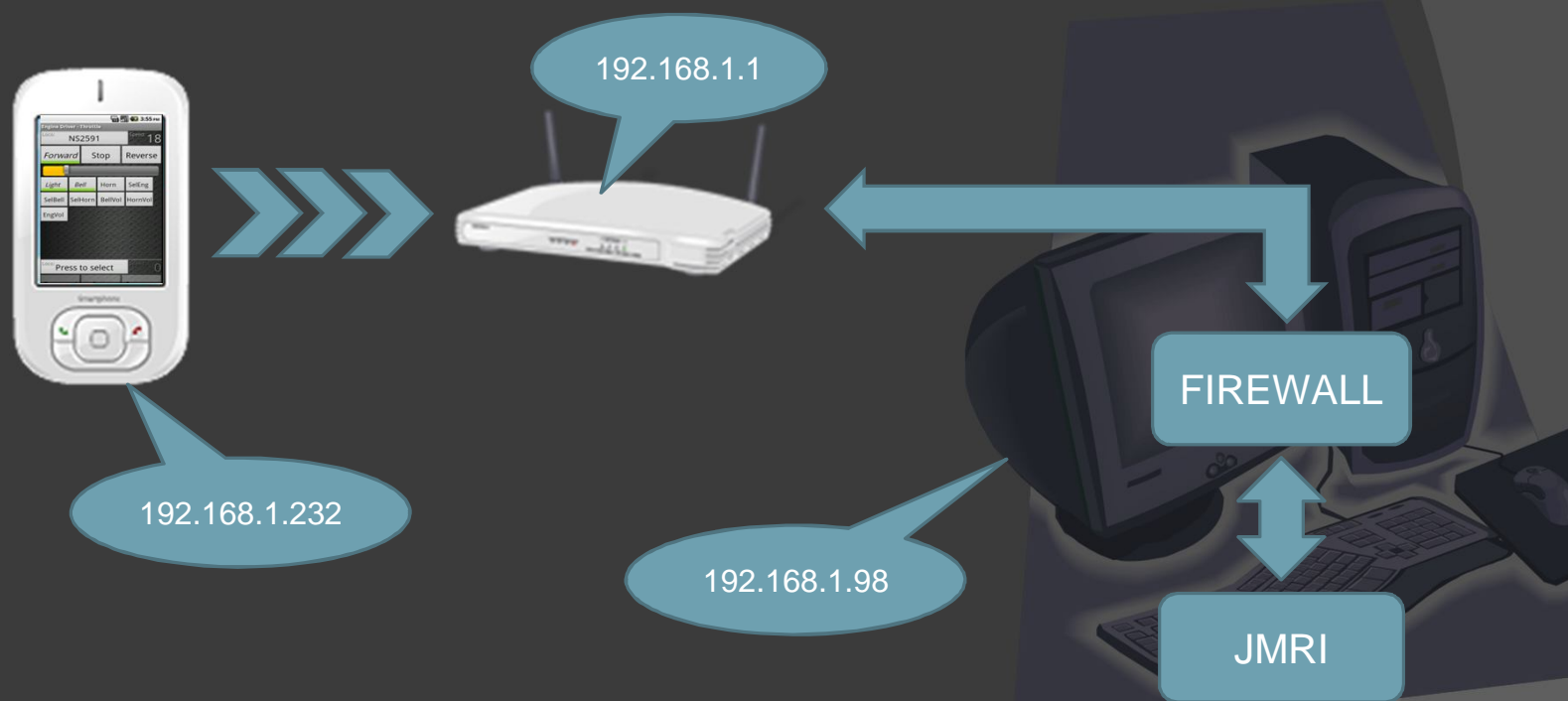
EngineDriver Statistics

- ⦿ 4,000+ users with 11,000+ downloads
- ⦿ Hundreds of different devices
- ⦿ Dozens of countries

EngineDriver To-Do List

- Multiple throttle layouts (switcher, vertical)
- Flexible layout for larger pads
- Show panel based on train location
- Consist direction, write CVs
- Speed matching app

Local Network (LAN)



RPi -> PR3 -> DB150 -> layout



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More Information

- EngineDriver: Google Play Store or EngineDriver.RRCclubs.org
- WiThrottle: iTunes or WiThrottle.com
- JMRI: JMRI.org
- Support:
groups.yahoo.com/group/jmriusers/
- Email robin@n3ix.com