Running Trains with Your Smartphone

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Seems like you can do anything with your cell phone these days. I wasn't surprised one bit when I heard "there is an app" that mimics a wireless throttle for a DCC system. Is this a novelty, or is this really a viable way to operate your layout without having to buy a set of expensive wireless throttles?

How does this work? Do you need to make a phone call to your DCC command station? Or do you need to send text messages to your HO scale engineers who are running your locomotives?

Android and iPhones have the ability to connect to a your home WiFi network. You would also need a computer running JMRI which is connected to your DCC command station; how that is accomplished depends on your particular DCC system. That's really it. If you are already using JMRI/Decoder Pro to program your decoders, besides the wireless router, you've already got all the special stuff you need. You just need to download the application for each phone you want to use as a throttle.

Let's step through the requirements one by one, starting with your DCC command station:

- Computer Interface - Fully featured DCC command stations will have the ability to connect to a PC or Mac, and you will need to understand the best way to do this given your system. Digtrax users can use a LocoBuffer box which connect to the system's LocoNet. NCE Power Pro and CVP EasyDCC systems only require a connection to a PC's serial port. To check your specific system's requirements, see the JMRI Hardware Support page at **http://jmri.sourceforge.net/help/en/html/hardware/**

- Computer running the JMRI software - As frequently touted by the JMRI people, the JMRI suite of programs runs on top of Java, so any modern windows or other home computer could work for this application. It doesn't have to be the latest and greatest Mac or Windows 8 system, in fact an older computer actually works better, especially if the above computer interface uses the older type of serial port instead of a USB port. You can determine if your computer has a "DB-9" or DB-25" port by looking for a connector on the back of your computer that has either 9 or 25 pins in two rows and is sort of in the shape of a flattened "D". Newer computers will need to use a USB/Serial Port converter. My DecoderPro system is an old Compaq Celeron computer with 512MB of memory I probably bought 10 years ago and still runs Windows/XP. The JMRI version needs to be 2.7.9 or higher.

- WiFi Network - I'd venture to guess anybody with a home network probably has a wireless router so you didn't have to run cables through the house where you

Left: NCE Power Pro systems have a DB9 serial port right on the front of the box; you just need to plug that into your computer, with a serial cable or a USB converter. **Right:** The LocoBuffer-USB needs to be acquired separately from RR-CirKits and this particular model already comes with a USB interface, and no converter is necessary.

wanted to use your computer. Even my 85-year old father has one in his retirement home. You just need to make sure that your phone can access your WiFi network, and your JMRI computer can connect to your WiFi network.

- WiThottle or EngineDriver phone application - If you are a typical smart phone user, this is going to be a "no-brainer." You just need to go to your apps store and download it. For the iPhone, there are two versions of WiThrottle, a free "Lite Version" or a full function version which costs all of $10. If you have an Android phone, it appears that currently there is only a free version of EngineDriver. For more information on the WiThrottle app, go to their web site at **http://www.withrottle.com**. For EngineDriver information, the web site is at **http://enginedriver.rrclubs.org/**.
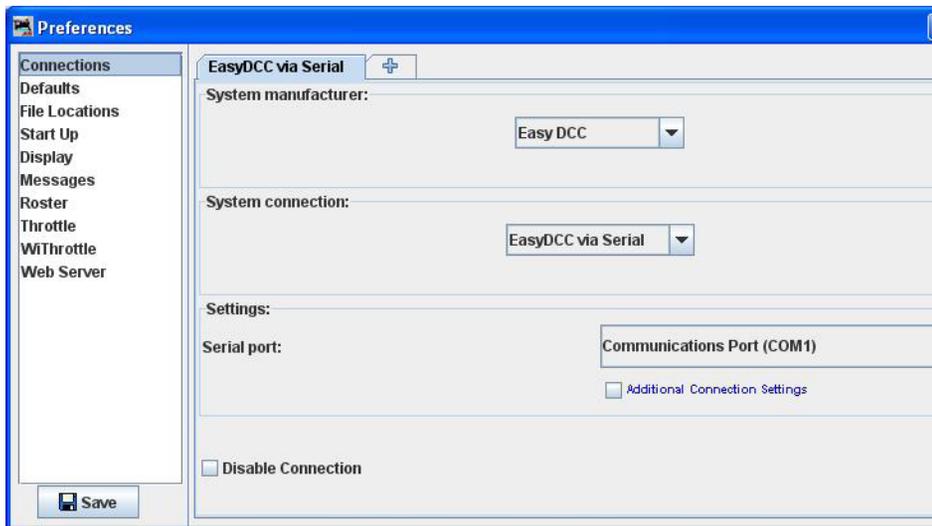
Setting up the WiThrottle Server

If you've gotten all of the above figured out, you are actually pretty much home free. You are going to need Java if it isn't installed already. The JMRI web site at **http://jmri.org/download**/ has a link under "Other Related Items" where you can install Java. If this scares you, then get help from someone in the club who understands this!

If you don't have the relatively current version of JMRI software installed, go to the JMRI web site at **http://jmri.org** scroll down to "JMRI 3.2 Production Version" and click on that heading. (JMRI releases new versions fairly fast, so the 3.2 version may

already be superceded by the time you read this). Then find the download link for your computer (e.g. Mac, Windows, or Linux). Click on that to get the software, then run the installer program. Your virus checker should verify that it doesn't contain any viruses. If you are unsure, consult your favorite computer expert. Unless you know better, use the default installation settings that the install wizard picks.

The installation takes just a couple minutes and will tell you if it completed successfully. Assuming it went okay, .your windows desktop (or comparable Mac program selection) should now show JMRI DecoderPro. Start that. You will now see a "Connection Screen" like so:

Fill in the information for your command station and use the JMRI Hardware guide if needed. Connect the interface to the command station, turn on the command station, and you should now be able to start the WiThrottle server. Click on the "Start WiThrottle Server" selection under the "Actions" tab:
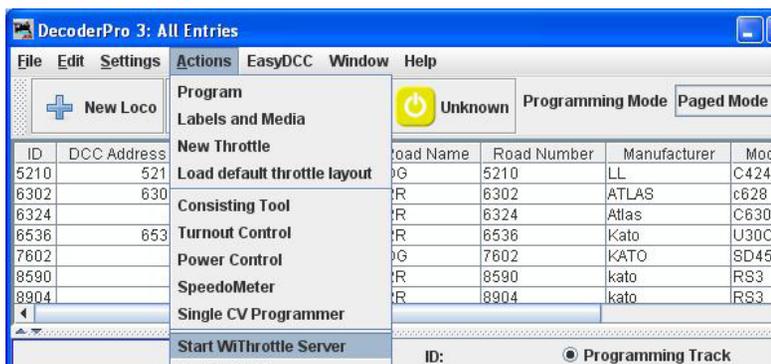
In software terms "Start WiThrottle Server" simply means you've turned on the program on the computer which listens for changes from the throttle app on the phone and relays them to the command station. The command station is actually the throttle, the app is only sending instructions to the Command Station.

It will take about 30 seconds for this to start; when it does, it will show an IP address and port number. In the example below, "192.168.1.112" is the IP address, and "1067" is the port. Write them down! You will need them to configure the phone app.

Setting up the Phone App

EngineDriver and WiThrottle provide basic throttle functionality and work pretty much the same, but look slightly different. The paid WiThrottle version also gives you the ability to setup Advanced Consisting and several additional capabilities. Both free versions give you the ability to use Advanced DCC Consists, however.

When you start the application, you are prompted for the IP address and port. That's what you saw when you started the WiThrottle server (see figure above). This is how the phone's IP stack knows how to contact the WiThrottle server, i.e. the JMRI software running on your computer which is connected to the DCC command station.

Once started, you can get a list of locomotives and consists that JMRI DecoderPro knows about. By tapping on the one you want, you can select any of those and immediately start running it. No special incantations or selection of keys to acquire the locomotive you are assigned.

But be careful ! The first locomotive I tried to run was coupled to a 20 car coal train. I wasn't ready to use the slider speed control (no knobs on your phone of course), and gave it full power in reverse. Immediate "hopper car accordion," luckily I don't use "live loads." It takes a little getting use to, and you should probably start out running a light engine around the layout.

As you can see from the screen shots, both EngineDriver and WiThrottle have a keypad with the speed control and function keys. The speed controls are a slider with a display of the current throttle speed step. We could access light and sound controls from both versions, and if you ever needed them, 25 function keys are present. I don't have DCC controlled turnouts, but if I did, I could control them also.

I have noted that this app really zaps the battery pretty fast. You could probably run for a short operations session without a recharge, but not a Rocky Op weekend!

So, is this a viable way to run your layout? Could you forgo buying an expensive set of wireless throttles and just tell all your operators to come with their phones loaded with the EngineDriver or WiThrottle applications?

I think it depends. Running a train in this manner takes a little getting used to. As can be expected, a teenager adapted to this faster than his father. We think these smart phone applications have a future.

BUT, the real exposure is that if your WiFi network is not protected, anyone or those you have given your router's WiFi authentication codes can now run your trains any time you have the server running. From as far away as your WiFi network extends. One of your prankster operators could park in front of your house and start running your engines. Where I most think this is going to be a problem is when your session is winding down and somebody is leaving the layout room, fumbling with their phone, maybe to call their wife, and accidently restarts the last engine he was running. Better stop JMRI when you are not using it!

Isn't technology great?
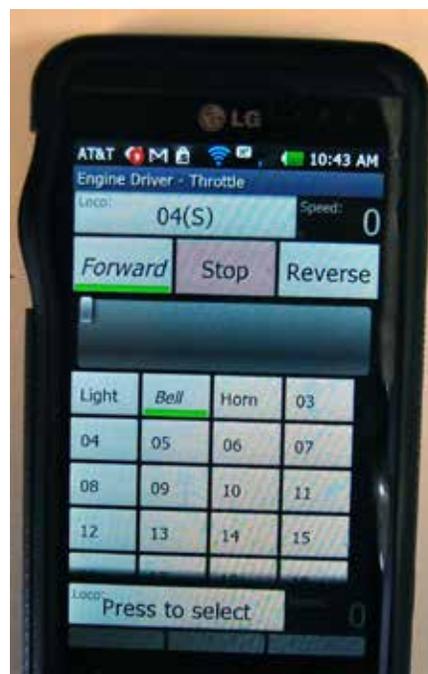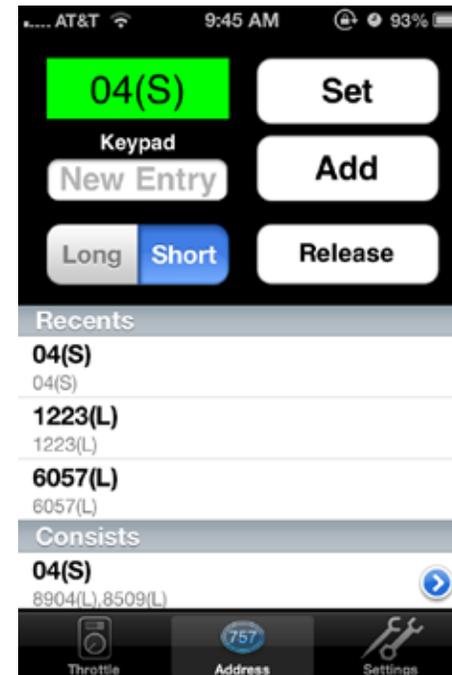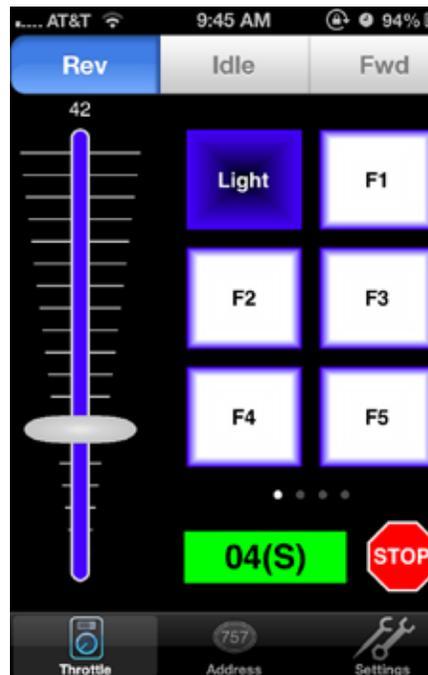
Above left: This is the WiThrottle's control panel, with the speed control slider on the left and lights and function buttons on the right, note the WiThrottle (iPhone) version has an obvious Emergency Stop button. EngineDriver does not! Above right: This is the locomotive consist selection screen for WiThrottle. You can select your engine or consist from the list that JMRI/DecoderPro maintains. Far left: A typical teenager not having any problems adapting to something new. Left: EngineDriver's control panel, note that it is slightly different than WiThrottle's, as it has a horizontal slider to control speed. Also note that at the time this was taken, the battery was pretty healthy. An hour later this particular phone needed recharged.