



Model Railroad Hobbyist |

# DCC IMPULSES

column

BRUCE PETRARCA



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## DCC Throttles

E-mail frequently provides me with ideas for this column. Recently there was a question about throttles (also called cabs or handhelds) on one of the groups I monitor. This got me to thinking about them and I decided to share some of those thoughts with my readers.

The throttle is one of the most important considerations in DCC. It is the equivalent of the keyboard, mouse and display of your computer, all rolled in one. Here's where you tell the DCC system what you want it to do, and it tells you what it is doing.

Frequently, a user's comfort level with the throttle drives their selection of DCC system brand. Try all the various throttles for the brands of DCC system you are considering. What comes with a beginner's set may not be what you will want to standardize on for your eventual layout.

Very few throttles will work with more than one brand of DCC system. The ones that do work with different systems are usually third-party units and are frequently not as ergonomic as the name brand units. This is why it is important to be comfortable and happy with the throttles offered by your manufacturer. The makers will tend to keep the same models for many years with perhaps a feature adjustment along the way.

Let me say that there is no throttle that I personally find perfect. For operations, I own a Digitrax UT4R (radio) throttle and a NCE Cab-06PR (potentiometer, radio), as I frequently operate on layouts with both systems. My ideal throttle would combine features from both of them.

It is important that you like the throttle for your system and feel comfortable with it. Here are some features and ideas for your consideration.

## Types of throttles

One of the important criteria is the way that you tell the system how fast you want the loco to go. Speed is by far the most frequently changed setting. Throttles tend to be grouped by the method of speed control. There are four basic ways of communicating speed desires to the system. I've been hoping someone would develop direct telepathy, but so far, no luck.

### 1. Digitrax UT4D (duplex radio) potentiometer style throttle -- direction selector switch is on the top left, here in the center-off (brake) position.



**Potentiometer** is a fancy name for the type of control that was used to adjust volume on radios a few years ago. They rotate about 270° and have stops at the ends.

Throttles that use pots (short for potentiometer) usually have a line on the knob so you know where you are in the rotation.

The advantages of a pot style throttle are:

- Quick, visual confirmation of your speed setting, just look where the line is pointing.
- When using a throttle in “yard mode” (which I’ll discuss later), having a line showing you where the pot is positioned is helpful.

The disadvantages of pot style throttles are:

- The stops on the pots used in modern throttles are not as robust as those in classic radios. Heavy-handed operators can break them. You might ask about repair policies and costs for the brand(s) you are considering.
- When you select a loco with a pot throttle, the train immediately goes to the speed and direction set on the throttle. When you are running more than one train on a single pot throttle, the transition between trains can be interesting: instantaneous speed and/or direction changes.

## 2. NCE Cab-06er (radio) encoder style throttle



**Encoders** are increasingly used in volume controls and they have advantages in throttles, too. They go around and around with no stops, thus, there is no need for a line on the knob. It would be meaningless.

The advantages of an encoder equipped throttle are:

- No stops to break.
- When moving between multiple trains, there are no speed or direction surprises.

The disadvantages of an encoder equipped throttle are:

- No direct indication of speed setting, unlike the line on the knob of a pot throttle.
- No indication when you have hit the end of the control area. With a pot, there are specific stops - you know when you hit zero or max speed. With an encoder, you wind up turning the knob counter-clockwise just to make sure you have set the speed all the way to zero.

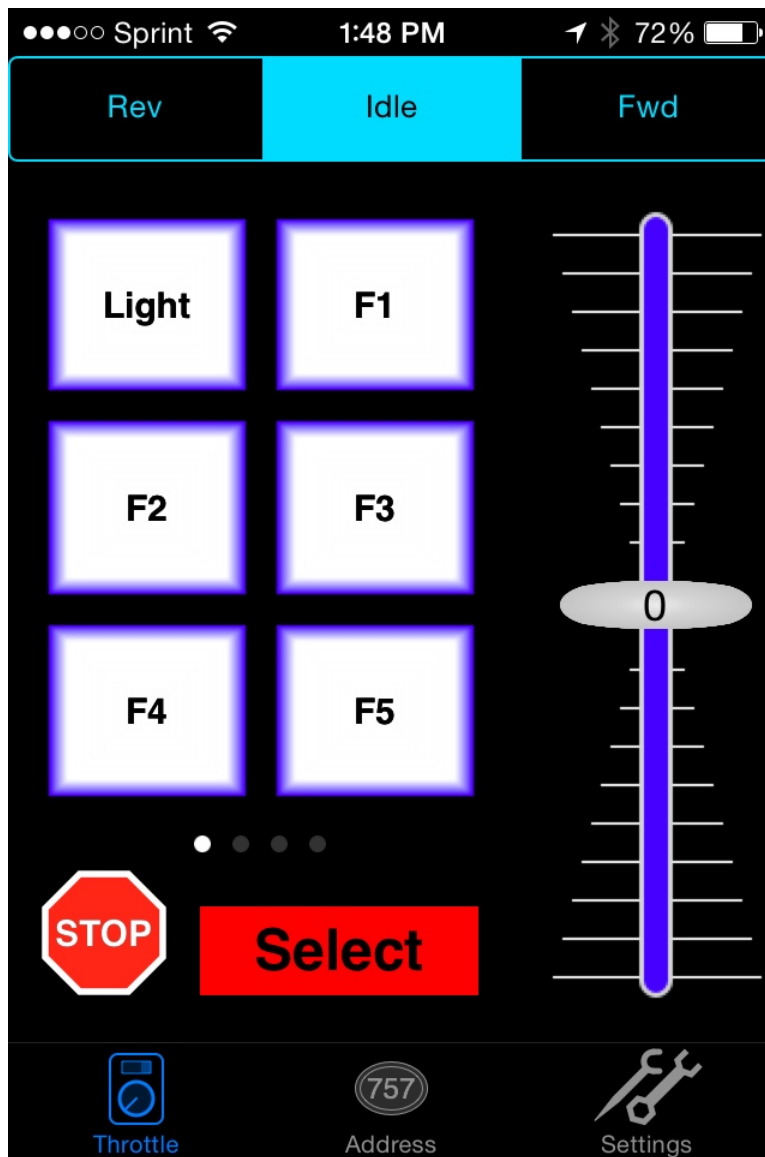
3. Lenz LH100 button control throttle - the down speed controls are circled, the up speed controls are the buttons on the right.



**Button** control as the exclusive method of speed control is rare on throttles. Some high-end throttles have both knob control and button control. The two most popular throttles exclusively with button control are the Lenz LH100 [3] and the NCE Cab-05. I personally don't like button control for most running. On the rare occasion when I'm trying to hit a specific speed step, like the first step, I find buttons advantageous.

All of the exclusively button control throttles that I'm aware of use two buttons for each direction. One button (labeled V on the LH100 [3]) moves one step and the other moves several steps, for each direction.

#### 4. Slider style throttle on an iPhone using the free WiThrottleLite app



**Slider speed** controls, while seen on some DC power packs, are rare on DCC throttles. Sliders are represented on WiFi connected smart phones and tablets. There are apps for both Android and Apple phones. The basic apps are free. The full-featured version costs a few dollars. The DCC system needs to be running JMRI and be connected to a computer and a WiFi hot spot.

The slider control in these apps is frequently a yard mode style, where the middle of the range is zero speed (as shown in [4]) and each end is maximum, either forward or reverse.

## Ergonomics, including knob orientation

How does the throttle feel in your hand? Can you adjust speed with the hand that is holding the throttle or do you need two hands? How easily can you read the display and from what angles? How easily can you access the function buttons? These are the ergonomic style questions for you to evaluate.

**5. NCE's ProCab with the (encoder) speed control knob extending edgewise out the front panel and speed control buttons, too, all in the SPEED box. Many folks comment on the very readable display.**



Bucking the trend of having the control knob stick straight out of the front of the throttle, the NCE ProCab, and the related PowerCab, both have the encoder mounted

with its shaft parallel to the front panel with the edge of the knob sticking out. Some folks feel that this is one of the most ergonomic designs available, yet others are turned off by the unorthodox design. Personally, I like it.

## Programming throttles vs. operator throttles

Most DCC systems have two levels of throttles, those that are aimed at operators and those with a lot more buttons and functions to program locos and set up consists. There is frequently a large dollar price difference between them, too.

Most layout owners have a limited number (perhaps one) of programming throttles, and more operator throttles. Several reasons are behind this, including minimization of cost and keeping programming capabilities out of the hands of the entire fleet of operators. Frequently there will be a hostler job where consists need to be created or broken up. This job will need the programming throttle. Once the consists are built, they can be run on any throttle.

## Displays, consists and programming

A few of the operator level throttles display what the command station is doing, such as a confirmation of the loco direction. The NCE Cab-06 series [2] is an example of this style.

### 6. Digitrax DT400 series throttle with two encoder speed controls (black knobs) and a small display screen -- the duplex radio DT402D model is shown.

By necessity, programming throttles, such as [5] and [6], need to tell you what the command station is doing, so they have a display. Since they have a lot of controls and a display, they tend to be a bit cumbersome to hold. I have developed techniques to operate with either the DT400 series or the ProCab, but each took some getting used to.

In selecting a throttle, check out the display visibility when directly viewed and when viewed off angle. Take the time to understand what it is telling you and see how logical it seems.



## Selecting direction and yard mode

There are two basic ways of selecting the direction of travel for your train:

- A toggle switch, such as on the Digitrax UT4 series [1]
- Push buttons, such as on the NCE Cab-06 series [2]

The advantage of the Digitrax method [1] is that there is a center-off position. You can “center your selector”, as they say in prototype diesel locomotives, and know that the loco won’t be told to move by a bump on the knob. The disadvantage of this sort of design is that it may be more difficult to operate one-handed.

The advantage of the NCE method [2] is that there is a button which will toggle the direction that can easily be pressed with the hand that holds the throttle. Some models have buttons for forward and reverse, so that you can make sure the loco will move in a desired direction. The NCE throttles also have an option for yard mode.

Yard mode is a fun way to switch cars. With a potentiometer throttle, the stopped position is with the pointer at 12 o’clock. When the pointer is at 7 o’clock, the loco is being told to run full speed in one direction. 5 o’clock is full speed in the other direction. I like switching this way. However, there is a learning curve. When things go a bit awry, the natural tendency is to rotate the knob fully counter-clockwise. This would be zero speed with a normal throttle set up. With yard mode, fully counter-clockwise is full speed in one direction.

## Cutting the cord - wireless operation

Getting away from tethered operation usually enhances the operating experience. It is nice to not have to worry if you are plugged in to change speed or stop quickly. Another benefit is avoiding a tangle of cords.

Most DCC systems are available in wired and radio versions. If you don’t start with a radio system, I recommend you investigate how to upgrade to radio should you decide to do so later. Digitrax and NCE both offer after-the-fact factory radio upgrades for their throttles. Both also offer the radio base units by themselves. So, converting to radio can be as simple as purchasing a radio throttle and a radio base unit and plugging the radio base into your throttle bus. And you may be able to have your existing throttles upgraded.

The use of WiFi connected smart phones [4] with a JMRI computer controlled layout is another way to easily add cordless throttles. Smart phones are frequently available for bargain prices, making for a very inexpensive way to have a bunch of wireless throttles.

Folks always seem to have additional ideas to share. Just click on the Reader Feedback icon at the beginning or the end of the column. While you are there, I encourage you to rate the column. "Awesome" is always appreciated. Thanks.

Until next month, I wish you green boards in all your endeavors.

# Mr. DCC's Workshop

## SoundTraxx' Econami decoder

Just as I started this column in mid-July, SoundTraxx announced a totally new sound decoder line. The Econami series is the beginning of a new series of decoders to replace the aging Tsunami series.

The Econamis will be available in 1-amp and 4-amp versions, with \$80 and \$150 list prices. The 1-amp version will be available with two interfaces - wires and the 21-pin board that has become so popular amongst loco manufacturers.

### **7. ECO-100 1-amp Econami decoder - 27 x 10.5 x 5 mm - \$79.95 MSRP**



They should be shipping by the time you see this in print. I plan to have a full review in a column very soon.

8. ECO-400 4-amp Econami decoder - 69 x 30.5 x 14 mm - includes a 3 watt audio amplifier - \$149.95 MSRP

