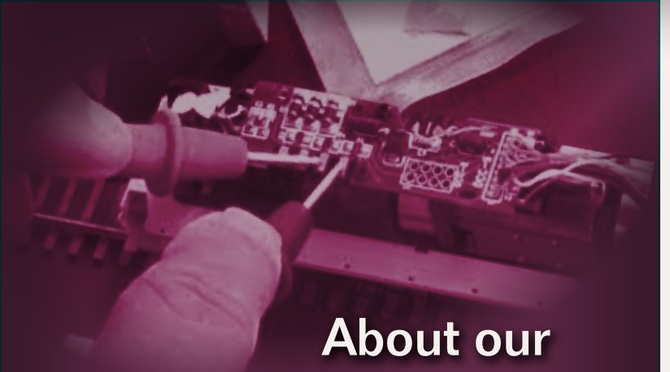


About our DCC columnist

Bruce Petrarca is a well-known expert on all things DCC.

Click here to learn more about Bruce.

DCC Impulses: DCC System Comparison Part 1

DCC Systems from a User's Perspective

Reader Feedback (click here)

There is more to selecting a system than specifications ...

Firstly, let me thank you, the loyal readers of my column. This is my twelfth – a full year. During that time I had a long streak of being in the top five in the "favorite articles per issue" voting; a humbling experience for a columnist. I promise to work hard to keep it interesting and fun. I hope you continue to agree.

This month, I'm starting a two-part article comparing DCC systems.

I cut my DCC teeth on Digitrax. I used a Super Chief for programming and testing most of the time I owned Litchfield Station, purchasing my first about 12 to 13 years ago. I also used a Zephyr and DecoderPro. Both clubs I've belonged to have Digitrax radio systems, as do several layouts that I operate on an almost monthly basis.

I built a demo layout at Litchfield Station that could be operated by Digitrax, Lenz or NCE systems, so interested folks could compare the operation of them side by side.

I am now using a NCE PowerCab on my test bench and small switching layout. My Fn3 layout has the NCE 10-amp radio system. Other layouts that I operate on regularly use NCE.

All three of these manufacturers have a long pedigree, spanning about 20 years now.

I have helped folks design layouts with all three systems. I've even been involved in two mixed layouts; in both cases, using Digitrax radio throttles and command station with NCE boosters. I'll cover how to make this connection in this month's SMP, following this article.

The goal of this column is to share my experiences with these systems to help you make a more informed decision if you are looking to make the jump into DCC or to change your system.

Lenz

To start, I'm going to pay homage to Bernd Lenz. He created the basic structure of what we know as DCC today. He provided for multiple vendors by donating his patents to the NMRA. This helped with the creation of the NMRA DCC Standards and Recommended Practices that keep things running together. Without him, we wouldn't have the consistency we have today, in my opinion. Thanks, Bernd (1).

The Lenz system is beautifully engineered and manufactured; as one would expect, being from Germany.

They sell a lot of systems in different countries outside the USA. The intrinsic language of the system, as displayed on the controllers, is German. Yes, there is an English option, but the abbreviations are still based on German. A lot of the buttons on the throttles have icons instead of labels. I found myself needing to run to the English-language manual every time I tried to set something up.

This is why I never became a proficient Lenz user. So, I don't feel qualified to comment on the details of running on the Lenz system.

1: Set 100 from Lenz – photo courtesy of The Lenz Agency.

Life partners

I have frequently used the analogy that selecting a DCC system is like choosing a life partner. It is full of tradeoffs. The "givens & druthers" come to the fore. Some things you must have and others you are willing to forgo. All systems seem to have some drawbacks.

Sometimes after folks purchase a system, they find features that they didn't know it had, or that they wanted or needed. Sometimes, later on, they decide they are really glad that they have them.

So, what follows is my perspective on the differences between Digitrax and NCE systems.

Why not others?

I'm going to be working from the standpoint of personal experience and I only have extensive enough personal experience with Digitrax and NCE systems to provide a long-term evaluation of them. I don't want to work from hearsay or an hour or two of operation, just to include another system.

Selection criteria

Whatever you do with your DCC system, you most frequently are using the throttle. Some manufacturers call it a cab, but I'll use the term throttle here, just for consistency.

I believe one of the primary selection criteria for your DCC system should be how well you like the throttle. I've looked at a lot of nice cars that I wasn't comfortable driving, so I didn't buy. If you're looking at a starter level system, I recommend you look at all the throttles available from the manufacturer before making a decision that will lock you in. By "look at" I mean hold, run, use, program with, etc. Don't just drive them around the block, but take them on road trips. Compare.

Starter systems

Both Digitrax and NCE sell introductory systems with a street price less than $200. They both support 29 functions.

Digitrax Zephyr Xtra (2) is the highest priced unit. It is a console-style system with the potential to run a bedroom-sized layout. The throttle and function controls are on the top of a unit that can be angle-mounted to the fascia or sit on a shelf.

2: Zephyr Xtra from Digitrax – photo courtesy of Digitrax.

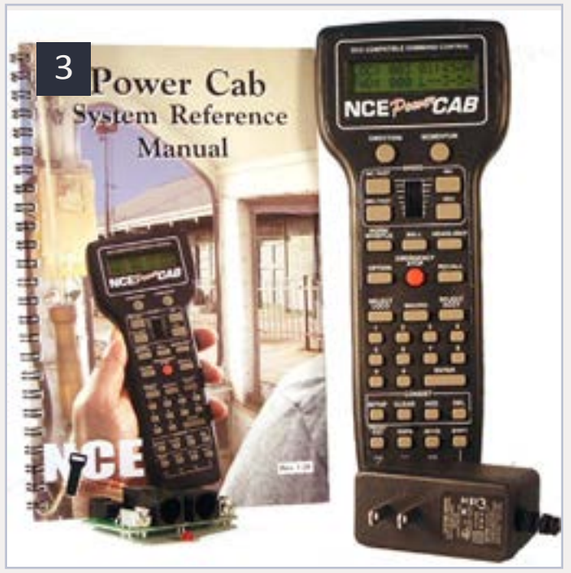
With the Xtra enhancement, the Zephyr now supports 20 additional throttles and 20 simultaneous loco addresses.

Digitrax wanted to make the transition from DC to DCC as easy as possible. They created a concept, called Jump Ports. The Zephyr series boxes have two connections on the rear where two DC power packs can be connected. The Zephyr takes their voltage and polarity and converts it into DCC signals for two locos. Thus, someone who is converting from DC to DCC, can run three DCC equipped locos immediately when buying only a Zephyr. The functions (lights and sound) for those Jump Port throttles are accessed through the keypad on the Zephyr unit. It takes a few button pushes to get the keypad associated with your jump port in order to tell the Zephyr which DCC address to link with which Jump Port or which functions to activate on which loco.

Personally, I dislike programming with the Zephyr keypad. Some folks have no issues. If I'm forced to use the keypad to program, I usually find myself back in the manual to figure the exact keystrokes to use. I did use a Zephyr on my test track for a year or so at the store, but with a LocoBuffer-USB and my computer with DecoderPro. The Zephyr will not read the CVs from sound decoders without a Programming Track Booster. You can, however, write to any decoder in "blast mode".

If you are looking for building blocks to a larger system, a Zephyr is a bit of a dead end. While you can add more power, in the form of boosters, if you exceed its command station capabilities, you will need to replace it or relegate it to running a yard.

The ***NCE PowerCab*** (3) is one of the NCE ProCabs with a command station and booster built right in. While it is based on a walk-around throttle, it must remain tethered at all times, as the track power flows through the flat cable connected between the PowerCab and the fascia-mounted panel. It provides adequate power for a small layout.



3: PowerCab from NCE – photo courtesy of NCE.

The PowerCab supports 2 additional throttles. NCE officially only mentions one, but two work just fine. The command station section will support all the loco addresses that any of the throttles you can connect will need.

One neat feature of the PowerCab is the ability to display the amount of current being consumed by the layout connected to it. This saves the need for a $50 accessory current meter, like the RRAmpmeter from DCC Specialties.

The programming menu system is very much a "lead you by the hand" set of questions. This is helpful for newcomers or folks who don't frequently do programming. For the experienced programmer, they become a bit cumbersome, requiring a lot of repetitive keystrokes to answer the questions. The NCE USB adapter (street price under $40) allows a computer connection. I currently use this on my workbench for programming and testing. The PowerCab has the programming track booster functions built in, so it will write to or read from any decoder I've thrown at it, and do it as well as any system out there. An exception are some MRC decoders that don't support read back, as stated in their literature, so no system can read them.

The PowerCab can be used as a walk around throttle on any other NCE system, so it makes a good building block for an expanding system. A radio board can be fitted, allowing it to be used as a radio throttle, as well, on a radio equipped system.

As I was writing this column, I learned that NCE would announce a new product at the NMRA national Convention.

The ***NCE Twin*** (4) will feature two "yard mode" (center off) control knobs and include a world-wide power supply for a street price around $120. It is rumored to support additional walk-around throttles, an external computer interface and automation. NCE is advertising it with the phrase: "Grows with your layout – *the nothing wasted growth path"*.

Since I haven't had my hands on one, I cannot comment on its functionality, but it would appear to pack quite a bit into a very price-competitive package.

Programming throttles

First, let's look at the throttles used for programming. If you have only one throttle, this will be the type you will need. Guest operators usually are supplied with a smaller throttle that won't allow programming. I'll discuss these later in this column.

4: NCE Twin DCC starter set – photo courtesy of NCE.

Both manufacturer's "big" throttles allow either button or knob selection of loco speed.

The ***Digitrax DT402*** (5) is the venerable DT400 updated to support 29 functions with no external differences except for the model number.

The DT402 has both wired and infrared wireless modes. I find that folks who live in countries where the available radio modes are illegal are the most frequent users of the infrared mode. There are radio versions available, as will be discussed later in this column.

The sheer quantity of buttons sometimes overwhelms new users. I find that they are well organized and clearly labeled, although the printing is pretty small. Some folks find the display difficult to read. However, it does show the condition of all 13 basic functions. System status is reported by a series of dots in strategic locations around the display.

Street price for the DT402 is about $150, with the radio versions running around $200.

The ***NCE ProCab*** (6) is physically larger than the DT400, allowing for larger buttons and display. Also, NCE has chosen to display less data at one time, making it easier to read.

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5: DT402 from Digitrax – photo courtesy of Digitrax.

6

6: ProCab from NCE – photo courtesy of NCE.

With the latest software, the ProCab supports all 29 functions - an upgrade ROM is available from NCE if you have an older unit.

A radio version is available.

Rather than relying on icons and dots to communicate to the user, the ProCab uses English, although sometimes abbreviated.

One feature that many folks like about the ProCab series is the MOMENTUM button. This feature needs a loco decoder that supports both momentum (CV3 & CV4) and programming on the main, as most current decoders do. When the loco is stopped, pressing the MOMENTUM button followed by a number from 0 to 9 adjusts the momentum setting. So, with, for example, a road switcher, you can press MOMENTUM 1 and have quick response while working in the yard. Once you've connected up a long train, press MOMENTUM 4 and watch it lumber slowly away!

Street price for the ProCab is about $125 with the radio version running closer to $200.

User throttles

Intermediate or user throttles are smaller and less intimidating to pick up and use for someone who is not familiar with a specific brand of DCC system.

They do not allow programming, keeping the casual user from making unintended changes to locos or to the system.

None of the current versions of user throttles allow the creation of consists. Thus, the hostler needs a programming throttle for whichever system is in use.

The ***Digitrax UT4*** (7) user throttle is considered by many to be the best in its class. It is easy to use.

There is a center off direction switch on the top. "Centering your selector" really means that the loco won't move. Also, if you are going one direction, you center the selector and then flip it in the opposite direction to reverse the loco.

The address is displayed on the four selector buttons on the throttle.

The loco is selected or dispatched with a funky system of holding down a button while plugging into the

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7: UT4R User radio throttle from Digitrax – photo courtesy of Digitrax.

LocoNet panel. Once folks spend some time with it, they seem to get the hang of it. However, frequently folks wind up selecting function 4 on the loco in the process of dispatching it. At our club (pcmrc.org) we frequently find locos in staging with the dynamic brake sound running (F4 on Tsunami decoders).

There are no dedicated buttons (like the NCE HORN button) on the UT4.

There is no combination of button pushes that will do weird things to the loco being addressed, or other locos or to the system.

There are no speed control buttons.

The UT4 is modestly priced (street price about $65, with the radio versions just over $100).

NCE has three basic versions of its intermediate throttles. They share the same small case. The difference is the data displayed and the method of controlling loco speed.

The ***NCE Cab04*** (8) series comes in either potentiometer (270° rotation) or encoder (continuous rotation) knob versions. The encoder version (shown) has a toggle switch on the top to select between two cab (and thereby, loco) addresses.

Direction selection is by two buttons, one for forward and one for reverse. When operating, it is one more thing to remember: which button to push to reverse your present direction.

There are two possibly troublesome buttons: a MACRO button and an OPTION button. These may be set up by different owners to do different things – unbeknownst to a guest operator. Pushing either of these buttons may start a series of events that the user did not intend. The good news is that pressing the ENTER button cancels the progress without any harm. It is a bit disconcerting to be unable to control your loco and find out that you pressed a the MACRO button when you wanted FWD. The OPTION button comes from the factory as a direction toggle button (8).

There is a HORN button that is a non-latching way of activating function 2.

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8: Cab04e (encoder version) from NCE – photo courtesy of NCE.

There is no display, so you select a loco by pressing the SELECT LOCO button and pressing up to 4 digits and then ENTER. The only way you can tell if you have successfully selected the intended loco is if it responds to the throttle or function keys.

The encoder version can also be set to yard mode where the loco goes one direction or the other or stops, depending upon the encoder location. The advantage is that it is easy to change direction without pushing any buttons. The disadvantage is that you don't know for sure that you have the loco at a full stop (speed step 0).

Street price for the potentiometer (Cab04P) version is under $75. The encoder adds about $15. Radio adds about $70 for either version.

The ***NCE Cab05*** (9) is just a Cab04e (encoder version) with pushbutton speed control instead of knob.

The remainder of the prior discussion of the Cab04 holds for the Cab05 except for the yard mode.

Cab05 street pricing is about $70 and $145 for radio.

The flagship of the intermediate cabs is the ***NCE Cab06*** (10). Available in both encoder and potentiometer

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9: Cab05 from NCE – photo courtesy of NCE.

10

10: Cab06 from NCE – photo courtesy of NCE.

versions, it features a display so you know better what you are controlling.

A single button toggles the loco direction.

There is a shift button that allows access to all 29 functions and many other options for this versatile throttle. Just so you don't get too confused, there is an cheat-sheet on the back of the throttle, showing you what a number of shifts plus pushing other buttons will do.

This is the only throttle in this size range that will allow you to throw turnouts through your DCC system and stationary decoders. Street price is about $80, up to $150 with radio.

Ergonomics

Okay, we have run through the data on all the throttles, but that is kinda like deciding on a car by reading the brochures. What really matters is how it drives. If a picture is worth 1000 words, what is a video worth? Here is a comparison I put together just for you folks. Enjoy it.

Part two in October

This month's column has been oriented to the user interface of DCC systems. Tune back in next month as we dig deeper into the system itself.

Meanwhile, use the Reader Feedback button on the next page to vote on this column and post your comments on the MRH blog.

I hope you find this information awesome. ☑

A sidebar continues on the next page.

SMP* Connecting NCE boosters to a Digitrax command station

In this month's column, I mentioned two layouts that are mixed, with a Digitrax command station and LocoNet radio network connected to several NCE boosters.

Why would someone want to do this? In both cases there was a large investment in Digitrax radio before NCE got the wrinkles ironed out with its version 1.5 radio system. The owners wanted the robust NCE booster(s) without buying more throttles and radio bases.

Here is how to make that connection. Starting with two cables, 6-position 6-conductor (6P6C LocoNet style) and a 4-position 4-conductor (4P4C Control Bus style) cable, you simply connect the two internal wires from the Control Bus cable to the outer two wires of the LocoNet cable. Insulate them from each other with shrink tubing and put a piece of shrink tubing over the outside of the cable for support and protection.

In the drawing below, you can see that the tabs of the connectors are up. This is important to keep the phasing of the systems consistent. I removed any reference to the wire colors, as all cables are not colored the same. The tabs are your best way of telling that you have the correct wires connected to each other.

The 6P6C connector plugs into the LocoNet anywhere. The 4P4C side connects to one of the Control Bus sockets on the NCE booster.

Run a wire (the same gauge as your largest track bus) from the Digitrax ground connector on their command station to the case of the NCE booster.

** SMP comes from the Amtrak world and is short for Standard Maintenance Procedure.* ■

Reader Feedback (click here)