

Command Control Benefits

Systems built to meet the NMRA's Digital Command Control Standards provide more advantages than any other system on the market. We will start by listing the advantages of having any command control system, then move into advantages of DCC over frequency (analog) command control systems.

The first, and foremost, benefit of command control is the fact that you can run your trains the way you want to run them. If you simply want to run a lot of trains on the mainline, you can. If you want to run prototypically, you can. Many people have never bothered to learn how to run prototypically because, even if they knew how, they couldn't do it anyway. Command control allows you to run your trains however you want to run them - prototypically, or not.

You can MU loco's together into a consist that can be controlled with one knob as a single unit, you can have helper service without regard to electrical blocks, have two or more switchers doing yard operations without conflict, and you can even have cornfield meets (head on crashes) - if you want to consider that an advantage. The bottom line is this: you don't have to build your layout to conform to electrical considerations, and electrical considerations will no longer enter into the operations of the trains on that layout.

Along the same lines is this: you get more pleasure when running your trains because you have more time to watch the trains go. With block control, at least part, if not most, of your attention is on throwing toggle switches to keep your train running. With command control, you don't have toggle switches to mess with, so you can watch the trains run instead of messing with a control panel full of toggle switches. It's the elimination of these toggle switches that gives command control the capability of realistic operation, MUing anywhere on the layout, and to have pusher service the way it should be.

You can also get more pleasure out of your layout because you can run more trains in a smaller area than you can with cab control. Because you don't have electrical block considerations, all your trains run on the same rail without regard to where an electrical block starts and ends. For example, if you have a 4 x 8 HO layout, it would be extremely difficult to run two trains at one time - because blocks would have to be so small that that's all you would be doing to run the trains. But many 4 x 8 HO layouts have more than enough track to run two trains at once. Digitrax's Challenger is the ideal (very low cost) system for this purpose. And let's face it. You will have more fun running your layout with another person operating another train on the same layout. While this example is for a small 4 x 8 layout, it is also applicable to layouts of all sizes, including huge club layouts.

Wiring is much easier. While larger, more complex, layouts require a fair amount of wiring and wiring complexity, it will always be far less complex, and much easier than wiring the equivalent layout with cab control. Just considering the fact that you don't have to run all that wire up to a control panel with toggle or rotary switches should be clue enough that wiring is easier.

Digital Benefits

Digital control provides a more accurate signal, and is more open for expansion to future technologies and thinking. Think about whether you would rather have digital or analog video and/or sound - digital, of course. Digital video and sound is more stable and clearer than analog. This provides inherently better throttle control. Not that a high-end frequency control system can't have better throttle control than a low-end digital system. But that, all things being equal, the digital control will have smoother slow speed running and acceleration.

Furthermore, digital is easier to upgrade with new features and technology. All you have to do to convince yourself of this is to look at computers. While analog computers were tried many years ago, they were quickly abandoned in favor of digital because digital is inherently more accurate, more stable, and more upgradable.

NMRA DCC Benefits

Besides the increased stability of digital over analog, further stability is acquired by having the power as the signal, rather than superimposing a small signal on top of the power voltage. That is, the DCC signal is the power, and the power is the signal. To find out more about this, refer to the section on [How DCC Works](#).

Because there is a DCC standard, there are many manufactures building DCC-compatible systems and components. This creates competition. Competition spurs technical advances, and keeps prices down. After all, why would you purchase a system with a higher price if it didn't provide substantial technical advances.

Because there are many manufacturers building components to meet these standards, it's less likely that your entire system will be obsolete if your manufacturer goes out of business. For example, if you purchase a DCC system from XYZ company, and that company goes out of business, you are not left without support. While you won't be able to acquire more throttles, except on the used market, you will be able to get more decoders from other manufacturers as you acquire more locos.

Accessories, like this, is where you generally need ongoing support. However, if you do need to increase your number of throttles to a point where you need to change systems, only your system will have to be changed. There will be no need to rip out all the decoders to install all new ones. Again, this is where most of the cost and work is involved. So, even if your system is obsolete for whatever reason, not only is all not lost, but your loss should be far less than half of it. With any other command control system, nothing is compatible with any other system, and all would be lost.

Also, because there is a DCC standard, there are third-party companies (companies other than the original manufacturer) that make accessories for DCC systems. The reason for this is simple. If a company wanted to make a sound unit for a single proprietary system, for example, his sales would be limited to only those people who buy that one system. However, if he makes a sound system for DCC, his market opens to people who buy from any one of more than five major companies.

Which would you build for? Proof of this already exists. Dallee and Real Rail Effects makes sound systems for DCC, Accurate lighting makes prewired lighting modules for DCC, Loy's Toys makes [Decoder Testers](#) and [Automatic Reverse Section Controllers](#), and others are gearing up for a wide variety of these and other products for DCC. For more information about this please refer to the [Product List](#) section.

Locos with DCC decoders can run on any DCC system, and also on any cab control layout - without physical modification. There are exceptions: some Wangrow decoders can't run on an analog layout, and some decoders can be programmed to not run on an analog layout which means that they will have to be re-programmed for them to do so.

DCC systems can run one DC analog loco along with the DCC locos. Most DCC systems will run the analog loco by selecting address zero (00). To find out how this is accomplished, refer to the [How DCC Works](#) section. Many people use this feature to test new locos before they install a decoder in it. Others like to be able to run friends locos on their layouts, and this provides them with a way to do this. SystemOne, and possibly Ram Traxx, requires modification to the system to do this. And then, the analog loco will be controlled from the command station, not with the hand-held throttle.

Who Benefits with DCC?

Everybody! Regardless of how large or how small your layout is, there are great benefits of NMRA DCC-compatible systems for you.

First and foremost, as previously stated, the main reason for DCC is the realistic operations attained by not having to flip a bunch of toggle switches to direct power around the layout, and not having to make sure one loco is completely out of an electrical block before another enters. And, just as important as that, is the speed control methods offered by the newer systems. The slow speed crawl and smooth acceleration and break is absolutely incredible.

Next, but not any less important, your DCC system will not become obsolete if "your" company goes out of business. Because it is DCC-compatible, it will be supportable by many other companies.

All systems have the basic 14 speed step control. Many of them have modifiable speed curve as well as programmable momentum and break. But, if that isn't adequate, the newer systems have 28 speed steps with the same programmability.

And if that still isn't adequate, you can step up to 128 speed step direct drive. With this mode, you can make locos (even low cost locos like Athearn and Bachmann plus) crawl so slowly that you won't even know they're moving if you're not watching closely.

And, if that still doesn't make your loco perform the way you want it to, they have a 28 speed table mode where you program in exactly how much power to provide to the locomotive at each of the 28 speed steps. With this, you can match performances of two very dissimilar locos to run together in an MU.

Until you see the 128 and both 28 speed step modes in operation, there's simply no way to explain how incredible this is. This is one time where you really do have to see it to fully appreciate how great it is.

Turnouts can be controlled from your hand-held throttle. I control my turntable with the hand-held throttle. The system can be connected to a computer for control, if you wish. And there are currently several companies coming out with incredible sound systems; all for O scale, many for HO scale, and even one for N scale. And, because they will be DCC-compatible, it will make no difference which DCC-compatible system you have, you will be able to choose from any of the companies that produce these sound systems.

DCC also has built in directional constant lighting. Some people have paid \$20 or more just to add this alone to their locos. Then, there's the ability to control ditch lights, cab lights, mars lights, or whatever. In addition to these advantages for all layout types and sizes, there are specific advantages for different types and sizes, each discussed below.

Small Layouts

It's usually difficult to operate two trains at once on small layouts - because the electrical blocks have to be so small you have to toggle switches every five to ten feet. And that's no fun.

However, with DCC there are no electrical blocks. If your layout has a mainline, industrial section, small switch yard, and/or bypass, DCC will allow you to run one train while a friend runs another. Think about it. If it's fun operating your layout with one train, it should be double the fun if you can have a friend operating another one at the same time.

Medium-Sized Layouts

Medium sized layouts that have, or would normally have, electrical blocking for two or three cabs also benefit. In addition to not having to toggle switches any more, you won't have to be absolutely sure one train leaves a block before another enters - one train can be right on the tail of another. You can also do passing moves much easier, and even run more trains at once than the layout was originally

designed for. However, the inherent DCC characteristic of walk-around throttles with memory can be especially important here.

Large Layouts

The benefits for large layouts are generally the same as for medium sized layouts, with the emphasis on greatly simplified wiring and operational versatility without flipping toggle switches.

Modular Layouts

There are three main benefits for modular layouts: Simplified wiring, multiple walk-around throttles, and more operational versatility.

One pair of track bus wires, with connectors, is the only track wiring needed - even for multiple engineers operating multiple trains. One solution for a low cost and easy to connect track bus would be to use short extension cords bought at any home improvement store (be sure they are the new indexed type so they can't be plugged in backwards). Simply plug one module into the next like plugging in an electrical appliance.

The throttle network for multiple walk-around throttles is just as easy as the power bus, but with 6-wire phone cable connected with phone plugs and jacks. With a 6-wire phone jack on the face and back of each module, engineers can plug their throttles in anywhere for operation of a train anywhere on the layout.