System Comparisons

Many people use system comparison charts to choose a system. However, comparison charts not only don't tell the whole story, they may be assembled such to promote one system over another. Since a dealer can provide you with a comparison that shows "their" system to be better than others, you have to take them all with a grain of salt and do your own homework.

For example, a person trying to sell you a System One might tout that it can run 250 trains - as if that's of any importance. While the command station may well be able to handle 250 trains, it can only handle 64 throttles. So in reality, the "system" can only handle 64 trains. Believe me, when more than two people are operating on a layout, each person will only be able to handle one train at a time. So being able to control more than one train per throttle is not applicable in this situation - but the dealer trying to sell you a System One won't point that out. Now, I'm not picking on System One here.

This was just an example to make a point. But, most dealers usually won't point out any deficiency of the system they're trying to sell to you. Sometimes this is purposeful, sometimes they don't really see it as a deficiency. Remember, a deficiency to one person may be an asset to another. In short, you still have to figure out for yourself which system is best for you.

One thing to keep in mind is this: there just isn't anyone who knows everything about every system. Even if there were, how would you know if he's giving you the straight poop - rather than skewing the details to sell you a system that he has in stock? Would he sell you the one he makes the most money on, or the one he's most over stocked in, or for some other unknown reason? What you really need is information about how to compare systems to do your own analysis. A feature list of all systems side by side will go part way to provide you with some of the information, but falls short of all the information you need to do a proper comparison - witness story #2 below.

We only deal in Digitrax systems, for reasons stated elsewhere on this site. However, it's so tough just keeping up with everything that Digitrax systems can do, we simply don't have the time and resources to keep up with all the other systems to the same degree we do with Digitrax. The only way to provide maximum support for any system is to know about it in detail this way. One simply can't do that with several systems, so one simply can't provide maximum support for any system if one carries several brands.

While dealers that carry several brands will never admit to it, they don't have the time and resources to delve into the intricacies of each system either - not the way we do with Digitrax. The only way anyone would ever know everything about any one system on a detailed level, is if that's the system they use on their own layout on a regular basis. Reading specs, and doing bench testing, just isn't the same as using the system regularly. I'll tell you two stories about this.

Story #1 My first DCC system was a Lenz Digital plus. At the time, it was the best one on the market for the money. About nine months later, Digitrax released the BigBoy system. I switched for only one feature - unlimited MUing. But, I quickly learned that the BigBoy System (now discontinued in favor of even more advanced systems) was far superior in many other ways, not just in MUing.

Over the next year or so, there were many people (usually dealers trying to sell a Lenz or System One) saying things about the BigBoy that simply were not true. Some of these people just didn't know any better (because they were only reading specs), while others knew better but had ulterior motives. For example, one person was saying that with the slave boosters and throttles on the same phone cable bus, the network would be severely limited. The truth is: it's practically unlimited, and having the boosters on the same phone cable changes nothing. Another person continually tried to make a case that the polling network which other systems use is better than Digitrax's peer-to-peer LocoNet network. The truth is: Digitrax's LocoNet is so versatile that it doesn't require extra wires for feedback, multiple computer interfacing, signaling, etc., and can still handle all the throttle traffic you'll ever have. The polling network of other systems require and additional network (more wires) for each additional thing.

In both cases, neither person understood Digitrax's LocoNet or its full capability. Unfortunately, I didn't understand the details well enough to argue about it back then. I only knew better because I had used both, and I knew that Digitrax's network was better. What neither of these people took into consideration was that AJ Ireland (the Digitrax EE) is far more insightful and ingenious than they could imagine. The design AJ came up with for LocoNet is so efficient that it continues to work even with some shorts and opens (read about the LocoNet elsewhere on this site).

The point to this story is this: most people (and this includes most dealers) do not fully understand how everything works in their own system, much less in all the others. So, when someone pretends to know enough about all the systems to give you a comparison of all, you better take it with a grain of salt - and remember, not everything can be charted.

Story #2

When we first started business, we also carried Lenz and System One. I did my first comparisons based upon the list of features provided by each of the manufacturers (I didn't really know any system on the intimate level like I now know Digitrax). In just looking at the feature lists provided, I dubbed System One as the Cadillac of the DCC systems. After all, it had advanced features that the others didn't have - so, I started using it. As I became more and more familiar with it and how things worked, I changed my mind and went back to Digitrax.

The point to this story is that you can't simply read a list of features to know which system is the best. You have to understand the "real" differences, and what they mean to you.

Conclusion:

I don't know any other system as thoroughly as I know Digitrax. So, I won't even try to give you a "direct" comparison - doing so could short change the other systems. Instead, I'll provide you with information on how you can compare other systems to Digitrax based upon criteria that fits *YOUR* wants and needs. My philosophy is that the only reason for comparing is to help with the quest to find the best system for you. Therefore, any comparison should be tailored to that goal - not to the goal of a dealer trying to sell you one system or another. In other words, don't let someone else's comparison side-track you with some obscure, unimportant, or meaningless issue - stick to "your" needs. But to do that, you need to "know" what some of the features really are and how they work, as well as other things.

So, if you're really going to find the best system that suits "your" needs and desires, you have to do a little work. I can't do it for you, but I can help you figure it out. Here's the method in a nutshell,

First: you have to learn what all the different features are. You can't decide whether you want it or not if you don't know what it is.

Second: you have to make a list of the features you absolutely must have, a list of features you'd like to have, but can do without, and put the rest of the features in a "don't need" list. You'll also have to make a list of comparables such as price and subjective choices such as style, display, and control type.

Third: obtain the complete list of features for each system you're comparing. Get that information from a reputable source for that system.

Note: a dealer that deals in two or more brands is not always a reputable source for any one system (how do you know whether or not he's skewing information to push one system or another?). With a manufacturer, or dealer in only one brand, you know he's going to put the best light on that system. And for goodness sake, don't believe anything he has bad to say about any other system without checking it out for yourself.

Fourth: use your comparison of the "must have" list to kick out any system that doesn't have them all. Then use your comparison of the "like to have" list to find the two or three systems that have the most things you'd "like to have". Then use your "subjective" list to make your final choice.

But remember, the key to all this is: you must know what all the features are, how they work, and what they'll do for you. So, starting here, I'll go through every Digitrax feature and explain what it is and how it works. Some of them may surprise you.

Number of Locos the System Can Run

Many people would put this in the "comparables" list. After all, some systems will run five, some 22, some 99, some 120, and one (claims, but could never do under any normal conditions) 250. While the Chief really can run up to 120 locos at one time, that is totally irrelevant to most people. Most people will never run more than 10 trains at a time, 20 at the most. Unfortunately, many people have chosen a lesser system based upon that one comparison alone (thinking that because they didn't need to run 120 trains, they didn't need that much system). They totally ignored all the rest of the features - some of which they later found they wished they had. The point here is that while you should not consider a system that

will not run enough trains for you, you should not turn away from a system simply because it can run more trains than you need.

So, instead of putting "Number of Locos run" in the "comparables" list, put it in the "must have" list with the number of locos you want to run. For example, if you think you might want to run up to 10 locos at one time, put "Runs 10 locos at once" in your "must have" list. Now, when checking off the features, each system either gets a yes or no.

One thing to keep in mind when considering how many locos you want to run is this: with DCC, it will be much easier to run more trains and locos than it is with a DC analog system. So, if you think you'll be running three trains at once, see figure five. If you think you'll be running 10 trains at once, see figure 14. While 10 trains may well be more than you'll ever run at one time, it's better to err on the side of too many than not enough. Trust me, when your friends find out how much fun it is running trains with DCC, you'll have more people running more trains on your layout than you thought possible.

Now, one thing about counting trains/locos running. If you plan to MU two or more locos together for each train, whether you count locos or trains is dependent on which MU method you choose. Whether the system specs state locos or trains, what they're really talking about is how many "addresses" can be controlled at one time. Anyway, pay close attention to the MU information below for more about this.

Digitrax's Zephyr can run 10 addresses*, the Empire builder can run 22 addresses, and the Chief can run up to 120 addresses at one time. Of course, you also have to provide enough booster power to power all the locos you will be running. Digitrax advertises that the Zephyr can run 10 addresses at once, but our testing shows that it can run up to 12 at one time

Boosters

Boosters range from 2.5 amps to 10 amps. Digitrax offers 2.5-, 5-, and 8-amp boosters.

N and HO scale should not use a booster greater than five amps unless you also use some sort of track power manager such as Digitrax's PM42. The PM42 allows you to break the boosters power down into four isolated blocks, each with Short-Circuit Protection of from three to 12 amps - depending on your scale and other needs. This allows you to use an eight-amp booster and still protect the locos with a three-amp circuit breaker.

O and G scales should use the eight-amp boosters. Some power-hungry S-Scale (American Flyer) systems will also need eight-amp boosters.

If you plan to run so many trains that one booster can't handle the load, you can add as many booster as you need - providing the system you buy allows for that.

All of Digitrax's systems come with one booster, and allow you to add as many slave boosters as you need. However, considering that one five-amp booster can run about 12 to 14 HO scale locos continuously, you have to have a pretty large layout to need very many boosters. The only exception for this is O and G scale, which can require up to one eight-amp booster for each train being run in some cases - depending on your locomotives and operation.

Power Supply

Most DCC systems do not come with a built-in power supply - the Zephyr does, but others don't. So, unless you start with a Zephyr, you'll probably need to purchase a power supply. And because it's not a good idea to run two boosters off of one large power supply, you'll need to get a power supply for each booster - if you need additional power. In fact, it's not a good idea to power anything else on the layout from the booster's power supply, so all that will need its own power supply too.

Most DCC manufacturers suggest that you can use your existing train "power pack" to power the DCC system to get started. While it can power the system and run some trains to get started, it's best if you don't make that your permanent power supply.

Boosters have built-in Short-Circuit Protection. For that to operate with maximum reliability, the booster needs as much amperage capability as the booster is rated for - i.e., if you have a five-amp booster, you need at least a five-amp power supply. Most power packs don't come right out and tell you what the amperage rating is - because it's usually pretty low,

and they want you to think you're getting more than you are. For example, if you check the specs on your power pack, it's likely to say something like 30VA. This means 30 Volt-Amps - that is, volts times amps. So, if you take the VA rating and divide it by the voltage, you get the amps. So, if the rated voltage is 12 volts, you would have 2.5 amps. You see, traditional power packs are designed to power one multi-unit train. Whereas DCC will power several multi-unit trains - so it needs more amperage.

As for voltage, there's a figuring out the ideal value for it: regulation, electronic voltage drop, bridge rectifier voltage increase, etc. Without going into explaining all that, here are the ideal voltages for the three scale settings DCC is designed for:

Scale	VAC
N	12
HO	14
O/G	18

Note: These voltages are based on which scale the booster is set for, not on which scale you're actually running. DC voltage input needs to be higher than these. AC voltage input is preferred.

If you use less than these voltages, train performance will suffer. If you use more than these voltages, the booster will run hotter than necessary. It's okay to use voltages a little higher than these. A little extra heat won't hurt. But, the higher the voltage is over these values, the more heat will be made - to a point you won't be able to run very many locos without the booster overheating and shutting down.

So, a typical five-amp booster set for HO scale will need five or more amps at 14VAC. A typical eight-amp booster set for O/G scales will need eight or more amps at 18VAC. Note: having more amperage than needed will not improve booster or train operation. But having less than needed will hamper both.

We are the only DCC retailer who has custom power supplies (which we call Model Train Fuel) and housings (called Model Train Fuel Tanks) made specifically for DCC. We have both a 5.5-amp and a 10.5-amp version of our Model Train Fuel, each of which can be wired for any of the three ideal voltages needed by DCC. The Model Train Fuel Tank is custom made for power supplies of this size, with plenty of venting out the sides, and allows the Digitrax booster to sit right on top. The wiring kits we provide (called Model Train Fuel Lines) include everything needed to hook up the Model Train Fuel inside the Model Train Fuel Tank – including toggle switch, pilot lights, circuit breaker, power cords, strain relief's, grommets, etc., and instructions.

Number of Throttles the System Can Support

This is like how many locos the system can run. Obviously, if you want to run five trains at once with five engineers, you'll need five throttles - one for each engineer. While running trains by yourself, you can usually run more than one at a time if the throttles offer that feature. However, when running trains with friends, during an operating session, each person will only be able to handle one train at a time - there's just too much going on for one person to concentrate on more than one train at a time. So, you will need one throttle for each train that is running. And don't forget that each yard hostler will need a throttle and will be running one loco each.

So, figure up how many throttles you ultimately may need (not that that's how many you'll order to start with, but that you can get up to that many if you need to), and add that to your "must have" list - again, giving each system you're comparing a yes or no.

And, again, if you think three engineers, figure five just to be safe.

Digitrax Zephyr can support 10 throttles, the Empire Builder can support 22 throttles, and the Chief can support 120 throttles.

Number of Speed Steps the System Supports

The NMRA standard and RP makes provision for 14, 28, and 128 speed step control. With 14 speed step control, you have 14 steps from stop to full throttle. That is, each speed step will increase the loco's speed by about 1/14th of the total speed. Likewise, each speed step of the 28 speed step mode will increase the loco's speed by 1/28th of the total speed i.e., control twice as fine as 14 speed steps. And, 128 speed step control gives super fine control with 1/128th steps.

I've heard arguments (usually from those defending systems that don't do 128 speed steps) that 14 speed steps is all you need because the real trains only have eight. Excuse me, but many real ones have more than eight, and we aren't controlling real ones. Since the real trains have massive weight, they don't accelerate or slow down as readily. Give a real train notch one for switching, and if it gets going a little too fast, kick it out to coast. Kick out a model train to coast and... well, models don't coast very well. One could also argue that you can simulate coasting with the momentum settings in the decoder. But momentum does not simulate coasting, it simulates braking. And if you put too much momentum in to try to simulate coasting, you're setting yourself up for some crashes.

With enough experience in various scales, one quickly learns that the smaller the model is, the more speed steps you need for reasonable slow speed operation. I learned this while operating an 1/8th scale train - the size you ride on. Even it needs more than eight notches for good slow speed control. Think about it: one inch per second in N scale is about nine scale miles per hour; one inch per second in HO scale is about five scale miles per hour; and one inch per second in G scale is only about 1.36 scale miles per hour. While you can do switching in G scale at three inches per second, it has to be done in N scale at about 1/2 inch per second you need finer control. If all you want to do is turn it on and go - no real operations14 speed steps is fine for all scales. But if you want smooth operation for switching and real operating sessions, you need more.

Digitrax's LocoNet systems have had 14, 28, and 128 speed steps since 1994. Further, you can have some running at 14 speed steps, some at 28, and others at 128 speed steps - all at the same time. Believe it or not, some manufacturer's systems still only have 14 and 28 speed steps, and at least one allows only one or the other, not both at the same time. So, whichever speed step resolution you want needs to be added to your "must have" list.

Types of Throttles

There are several types of throttles available, with some features overlapping various types. For example, you can have stationary, tethered, memory walk-around, and tether less infrared and radio throttles. Then you can have full-featured and simple basic throttles, but not necessarily with all the other options. Some explanation is needed here.

We'll start with the MRC Command 2000 type command station. This is a stationary unit with three throttles. If you're going to have others run trains with you, you will all have to crowd around the base unit, or purchase up to two walk-around throttles. MRC's Command 2000 walk-arounds have two throttles each. Because of the architecture, both throttles on both walk-arounds control the same trains - both control trains four and five, or both control trains nine and ten (note: with MRC Command 2000 you don't select a loco by its address, you control the train that is programmed into the throttle you're using). For walk-around #1 to control train #4, walk-around #2 must give train #4 full throttle. And for walk-around #2 to control train #5, walk-around #1 must give train #5 full throttle. Confusing? Yes, but the dealer trying to sell you an MRC Command 2000 probably won't tell you this up front.

A tethered throttle is like the Digitrax BigBoy master DT200 throttle. It's on a seven-foot cord and must remain plugged in while trains are running. Most manufacturers won't tell you a throttle must stay plugged in. If they don't say "all walk-around", or something like that, you can expect at least one throttle to not be walk-around.

Next is the memory walk-around. While it must be plugged in to actually control the trains, you can unplug it to move to another location and plug it back in. During the time the throttle is unplugged, the train continues to run at the speed it was running when the throttle was unplugged. With DC analog systems, this is called a "memory" throttle. If you want all your throttles to be "memory" walk-around, your system specs must indicate so. Except for the Zephyr throttle, all of Digitrax's current throttles are memory walk-around and/or radio or infrared tether less. Digitrax's infrared throttles can also be used as walk-around if you take them to a friend's layout that doesn't have an infrared receiver. Digitrax's radio throttles are both infrared and walk-around - so they will work under any circumstance when you take them to a friends layout.

Radio throttles come in two varieties: simplex and duplex. Simplex has one-way radio control. That is, the throttle can send signals to the receiver/command station, but cannot receive information back from the command station. This means, with a Digitrax system, the throttle must be plugged in to select a loco - since selecting a loco requires two way communication. For example, let's say the yard hostler has put a freight consist together, and has left the loco running at

5% throttle for you to acquire and take out. The only way your throttle will know the loco is already running forward at 5% throttle is if it can get that information from the command station at the time you select it - requiring two way communication. Once selected, only one way communication is required for you to control it, so you can unplug and go - controlling it from anywhere within 300 feet of the receiver. Today, Digitrax offers an infrared throttle, the DT400, and two radio throttles, the DT300R and DT400R.

Digitrax has been planning to introduce duplex throttles for a long time. We don't know if or when they will ever do that. But since duplex radio requires a receiver and transmitter in the throttle and in the receiver, both components will probably cost more than the current simplex radio throttle system.

One thing to keep in mind about radio throttles is that the receiver will be "hearing" all throttles. This means that if you're operating in a train show environment, with other layouts running close by, your receivers will be hearing all those throttles too. But don't fret. As has been previously stated about AJ Ireland at Digitrax, he thinks about all this stuff and has made provision for it. With the Digitrax radio throttle system, you can be running loco #27 on your layout with your radio throttle, and someone else can be running loco #27 on their layout with their radio throttle, and there will be NO interference between the two.

An infrared throttle works almost like a simplex radio throttle - the main difference being reception. Since it uses light signals, it won't have the range of the radio throttle, won't be able to be used outdoors, and may require more receivers in rooms that are not conducive to bouncing light signals around. Today, the DT400 throttle that comes in the Super Empire Builder and Super Chief starter set is infrared ready. The DT300 is an optional/additional infrared throttle. All that's needed to be able to use up to 10 of these on a layout is connecting a UR90 infrared receiver to LocoNet.

Some throttles have the capability of controlling more than one train at a time. Digitrax's DT300 and DT400 throttles have two knobs to have direct control of two trains at one time. While you can control two trains at once, the more important use of the second knob is to make things like programming and loco MUing easier. Some manufacturers have throttles that can toggle between locos - still having direct control of only one loco at a time. This can be handy if you're going to run more than one train at a time by yourself, but when it comes to a real operating session, you simply won't have the wherewithal to control more than one at a time when others are also controlling trains around the layout. When I run multiple trains by myself, I use two throttles, each of which has direct control of two trains. So, I have direct control of four trains at one time (which is about all I can handle by myself).

Some throttles have displays, some don't. However, those that don't usually have a way to tell what's going on with the train. For example, Digitrax's utility throttle (UT1 or UT2) does not have a display. But you can tell which loco it's controlling by looking at the selection dials, tell how fast it's going by looking at the throttle knob, tell which direction it's going by looking at the direction switch, and tell which functions are on by looking at the FN LEDs.

Some throttles have one or more knobs for train control, some have buttons for train control, and some have knob(s) and buttons for train control. For example, my first Lenz system had buttons only. It had a pair of buttons that would bump the throttle up and down by one notch, and another pair that would bump it up and down by five notches. Digitrax's Full-Featured throttles have two knobs, and single notch bump buttons. Digitrax's utility throttles have one knob and no bump buttons.

Following are Digitrax's current line of throttles, and their features:

DT300 and DT400 infrared control

DT399R and DT400R simplex radio control

In addition to infrared or radio remote control, these throttles are full-featured plug-in walk-around throttles that support four-digit addressing, full read-write programming, route and fast clock programming, speed step clicks on or off, local or global emergency stop, MU capable, have two-digital encoder knobs, display for loco address, speed, fast clock, turnout control, etc. The DT300 supports 9 functions (0-8) and the DT400 supports 13 functions (0-12). They are fully configurable to turn various features on or off. These throttles do not need a battery unless they're being used in the remote-control mode.

UT1 without programming

UT2 with limited programming

These are limited plug-in walk-around throttles with one potentiometer knob and no display. They do two-digit addressing, can control turnouts, and can support six functions. These throttles are not available in infrared or radio, so therefore they do not need a battery.

Throttle Knob Control

Most systems that use throttle knobs, use those knobs to control a potentiometer (pot, for short). These pots usually only have 270 degrees of rotation. When you consider that you have 128 speed steps, that means you have only slightly more than two degrees of rotation per speed step. Just the slightest movement of the knob will be two or three speed steps - not conducive to super fine control.

But, Digitrax's DT300 and DT400 throttles have digital encoders. They provide about 15 degrees of rotation per speed step - thus allowing super fine control. Furthermore, the throttle will click for each speed step change. This allows you to control your train without even looking at the throttle. In fact, many people hold and operate the throttle with just one hand, while never taking their eyes off the loco.

Fifteen degrees per speed step times 128 steps comes out to several knob rotations from stop to full speed. While most people rarely run their trains at full speed, it can still be a few knob rotations to get the loco to the speed you want. So, here's a couple of thoughts about that: 1) if you're turning the knob so fast that it's noticeable you've turned it more than one rotation, you're probably accelerating too fast, 2) the throttles have ballistic throttling - turn the knob faster, and each click becomes two speed steps - faster yet, and each click is three speed steps. So, you have both super fine control during normal operations and fast throttling for emergency stopping (or non-prototypical operation).

Fast Clock

Some systems offer a fast clock, some don't. For those that do, the command station usually controls it. With Digitrax, it doesn't have to. In fact, Digitrax's first LocoNet system, the BigBoy, did not have a fast clock. But, with the addition of a DT300 full-featured throttle, which has a fast clock built in, that throttle can have a fast clock display even on a BigBoy system. Further, if more than one fast clock throttle is used on a LocoNet system, they "lock" on to each other to synchronize the time. That is, if the time or clock speed is changed in one, they will all change - because that change is communicated on the LocoNet.

Any device on the LocoNet that understands the fast clock nomenclature, will receive those commands and comply. This allows (in fact we have) wall mount fast clocks that can be connected to LocoNet. These wall clocks can operate like another hand-held clock, or become a "master" that all others become subservient to. This distributed intelligence is a real example of the versatility offered by a peer-to-peer network like LocoNet.

Throttle Configuration

Digitrax Full-Featured throttles may be configured to work the way you want them to work. Of course, before a throttle needs this kind of versatility, it has to have features that various people would want to work in different ways. For example, not everybody wants the fast clock to show in the display - so it can be turned on and off. Following is a list of configurables in Digitrax's Full-Featured throttles:

- Ballistic Tracking - on or off
- Fast clock - on or off
- Throttle knob clicks - on or off
- Emergency stop - Local or Global
- Default speed step override (for new loco addresses only) - on or off
- Speed step default if override is on - 14, 28, 128
- Consisting type - UniVersal or Decoder-Assisted
- Radio or Infrared (if available) - on or off
- Radio or Infrared power saver mode - on or off

Throttle Network

There are three basic types of throttle networks being used on DCC systems today: hard wired, polling, and peer-to-peer.

The hard wired network is like that used with the MRC Command 2000 and Digitrax's original Challenger system. There's no digital communication going over the wires, only resistive throttle pot control. This is the lowest cost and most limited type of throttle system. You literally have to have one wire for every throttle, plus a common.

The polling network is what most other DCC systems use. It's where the command station goes out, in sequence, asking each throttle if there's anything to report. The command station is constantly going out to make these queries, so the network is continuously busy. While this type of network is just fine for several throttles, it is limited to just that - several throttles. If you want turnout feedback, that's another network (more wiring) designed for that. If you want signaling, that's anther network. If you want multiple computers, that's another network.

The peer-to-peer network is like the Ethernet being used for today's modern office environment. This is a system of distributed intelligence. That is, any device on the network has the capability to initiate a communication. So, instead of the command station having to go out and ask, it sits back and waits for a message to come in - the network is quiescent until needed.

Now, it isn't that all devices on the network "must" be able to initiate a communication, but that any can. A peer-to-peer network can be used like a polling system and peer-to-peer at the same time. That is, any device can query any other device for information. But any other device can also initiate communication with any other device as well - total versatility.

The main advantage of this is that one network does it all - not only all of what's available today, but for what's new (things not even thought of yet) in the future. Because there is a language to the network, new words can be made for new things not even thought of today. When these new words are heard by older equipment, they just ignore them. But, anything on the network designed to understand the new words will comply.

For example, when LocoNet was first designed back in 1994, the only devices used on it were throttles and turnouts (for feedback). It didn't have a fast clock or signaling. Today we do have a fast clock for it, Block Detection reporting, Master Control Panel controllers, signaling, and Transponding. And because it's a peer-to-peer network like is used for computer environments in today's office, it can also handle several computers at the same time it's doing throttles, turnouts, fast clock, etc. What's next? We'll find out year after year

All of Digitrax's current systems have a peer-to-peer throttle network called LocoNet©™. It can be up to about 2000 feet long (longer than anybody I can imagine will need). It doesn't require any termination or special configuration. Simply daisy chain it around from jack to jack, keeping pin one to pin one, and it just works.

Computer Interfacing

While most systems have provision to connect a computer for some kind of control, Digitrax's LocoNet allows you to interface as many computers to the system as you need/want. You could have half-a-dozen computers controlling various things - be it trains, animation, turnouts, turntables, you name it. And because of the way it's done, you can still control trains with regular throttles while computers are doing this other work. While most people do not need to have that many computers, we do have some customers who do. And it's nice to know if you ever need or want to, you will have the capability.

To interface a computer to LocoNet, all you need is an MS100 computer interface. It requires a Windows compatible computer with a DB25 serial port. If the computer has a DB9 serial port, then you also need an adapter. There are two types of DB9 to DB25 adapters: one will work, one won't. We only carry the one that does, but we carry it in three versions: short ($2.99), one foot ($3.99), and six foot ($5.99). Software doesn't come with the interface. Some people write their own, but this requires a fair amount of skill. There are LocoNet drivers available on the Internet. However, most people purchase software. Currently, we carry two packages: WinLok (a full- blown package that can do most anything), and Chief Configuration software that can program decoders, set the Chief OPSWs (configure the command station), and run one train.

One note about computer control: the computer usually just sends commands to the system command station, and lets the command station control the trains in the normal manner. In effect, the computer becomes a sophisticated throttle that can control many trains and other things at the same time. The reason for this is simple. To have the computer actually make the packets to send to the booster, that's all the computer would have time for. Since packets *MUST* flow

continuously, and at a specified rate, it would always be sending packets and have no time for other stuff. Since the command station already has the circuitry and programming to send packets automatically, it makes send to let it do what it was designed for, and use the computer to enhance operations.

Now, this doesn't mean that there aren't programs out there that can make packets and send them. There are. But, those programs are very limited in what else they can do - simply because there isn't enough clock time to do much more than that.

Signaling

In the past, you'd have some complicated wiring to do to have signaling on your layout. Today, Digitrax has block detectors that communicate with a computer, which in turns communicates with Digitrax's new signal controller for signaling - it's all connected via LocoNet's 6-wire phone cables. And, a company called Team Digital has signal control boards that can do signaling without the use of a computer. These boards get their block detection information via LocoNet from Digitrax's block detectors. And, there's more: Team Digital also makes a LocoNet board designed to do turnout and route control, but it is also useful in assisting with signaling tasks, especially prototypical CTC signaling and turnout control. Other companies make this sort of equipment for LocoNet too. There are just too many to list and describe here.

Transponding

Transponding is a system where a decoder can report back to the system. That is, when a decoder gets a packet, it reports back that the packet was received. This provides three potential advantages: letting the system know which signaling block the loco (or car) is in, transmitting data about the loco (or car) back to the system, and making sure a loco with a new command gets it quickly.

Transponding is used for loco and/or car locations.. This is accomplished with a transponding receiver attached to the BDL162 or BDL168 occupancy detector. When the loco (or car) reports back, only the receiver attached to the block detector will receive that loco's (car's) message, thereby letting the system know which block it is in. This can be used for computers to track a train around the layout, for whatever reason - collision avoidance, etc. The DT400 has a button to find a loco, and will report the loco's location in the throttle's display. It can also be used to implement braking and speed control sections, as well as automating hidden staging yards and other things where knowing an exact location of a loco would be handy.

Transponding is not part of the NMRA standard or RPs, and there's only two other system I know of that has something similar. With one of those systems, it doesn't work well with large MU consists like we have here in the states, and it's reported that the other one is using Digitrax's patented technology without permission. Only time will tell what happens in this situation.

Braking Section

A braking section is an area of track in front of a signal. When the signal is red, the train must stop. While many people like to watch the signals and control their train accordingly, some want the train to stop and start automatically when the signal turns to red and back again. There are three ways to do this: with DC analog conversion, with the Chief's braking section output, and with Digitrax's transponding system.

The DC analog method requires you to have decoders that can be programmed to not convert to DC. You then rig a relay to switch the track power in the braking section from DCC to DC when the signal is red, and back to DCC when it turns back to green. When a loco with a Digitrax decoder sees the DC power without the DCC signal, and programmed to *NOT* convert to DC, it uses the DC power to slow to a stop according to the programming in the braking momentum Configuration Variable. When DCC signal is restored to the section, the decoder starts the loco again, according to the acceleration momentum programmed into the acceleration Configuration Variable. This method requires the use of some automotive bulbs to assure voltage doubling doesn't occur if a loco crosses the gaps when the section is already getting DC voltage.

The Chief's braking section uses the programming track output when the system is not in the programming mode. When programmed to do so, it will put out the all-stop signal. Use a slave booster to boost this signal to power the braking section. Again, you'll have to rig a relay to switch between regular DCC track power and braking signals.

The transponding method utilizes a transponding receiver to know which loco is in the stopping block. The system then sets that loco's throttle setting to zero. When the signal turns green, that loco can then be accelerated back up to road speed.

Addressing

There are two basic addressing modes: two-digit and four-digit. If you have less than about 20 or 25 locos on the layout, two-digit addressing works the best. Just give each loco the address of the last two digits of the road number on the side of the loco. If you have duplicate numbers that way, see if it works out better by using the first two digits of the road number. If that doesn't work out any better, you may have to renumber one or more locos - or use four-digit addressing. Whether you use the first or last two digits doesn't matter, just be consistent - otherwise, you'll have to remember which is which. When you get to around 20 or 25 locos, you'll start having more duplicates than you'll want to accommodate. This is when, you'll want to use four-digit addressing to use the full road number.

To use four-digit addressing, you must have decoders that support four-digit addressing, a system that supports it, and throttles that can use it. All of Digitrax's current decoders support four-digit addressing and all of Digitrax's current systems support four-digit addressing. DT300 and DT400 throttles support four-digit addressing. And while the UT throttles can only select addresses "00" through "98" on their own, they can acquire any address dispatched by any other throttle.

Digitrax UT series throttles support two-digit addressing only.

Programming

There are two types of programming: Service-Mode, and Operations (OPS) Mode. Service-Mode Programming is where you place the loco on a special programming track to feed it programming code. Any loco on the programming track will take whatever programming code comes through, regardless of the loco's address. OPS-Mode Programming allows the decoder to be programmed anywhere on the layout. To do this, you must first select the address of the loco you want to program, then go into OPS-Mode programming. When you press the enter button after setting the CV and value you want to program, the system sends an addressed programming packet to that loco. Only that loco accepts that packet.

While there is only one OPS programming mode, there are three service programming modes: Page, Direct, and Physical register. For the most part, Page and Direct work the same - you learn one, you know both. However, the Physical programming mode is completely different. It has only eight registers. While the lower registers work just like Page and Direct programming for their purpose, a couple of the higher ones are used to set the address of yet higher Configuration Variables to program. It's all very antiquated and cumbersome.

Which Service-Mode method you use depends on the decoder. If the decoder requires the Physical register programming mode, you must use the Physical programming mode. Personally, I wouldn't buy a decoder that requires this. All of Digitrax decoders will program in the Page programming mode. Throttle Up (SoundTraxx) sound decoders can use the Page mode for the most part, but some DSX needs the Direct programming mode. Note, it doesn't hurt a decoder to use the wrong mode - it just won't program. So if your DSX sound unit won't program in the Page mode, try the Direct mode. Again, the Page and Direct mode work the same externally, so you won't know the difference. Only the Physical mode is different and hard to use.

OPS-Mode Programming is preferred in most cases. There are some limitations in some cases, which is why it's not preferred in all cases. For example, some systems do not allow OPS-Mode programming of the two-digit address. Also, some decoders don't allow it either. If either the system or decoder doesn't allow it, it can't be done. But if both allow it, you can even program addresses with OPS-Mode. But keep in mind that if you change the address you're controlling, you will no longer have control of it. You'll have to exit the programming mode and select the new address to regain control.

There are usually ways to reprogram the four-digit address via OPS-Mode, but it's usually just easier to stick it on the programming track - as is reprogramming the two-digit address.

The big advantage of OPS-Mode Programming is that the loco can be programmed anywhere on the layout, and you can see/hear the programming change immediately. This is especially good for programming SoundTraxx decoders - you can hear volume, tone, and other changes instantly.

Not all systems support all the programming modes - especially OPS-Mode. So, if you want OPS-Mode Programming, you have to be sure the system you get supports it.

The Zephyr and Chief support all programming modes, with Service-Mode Programming being on a separate output from the track output. The Empire Builder supports all programming modes, with Service-Mode Programming being broadcast from the track power and LocoNet outputs. All of Digitrax's decoders program with Page and OPS-Mode Programming.

Read/Write Programming

This allows you to read back what has been programmed into the decoder. For example, let's say you programmed a value into the Configuration Variable that tells the decoder how much power to give the loco on speed step one (this is called V-Start). A few days later, you decide that it needs to be bumped up a little, because it still doesn't start to creep at the speed you want. If you have forgotten what value you previously programmed in, you won't know what new value (a little higher) to put in. With Read/Write programming, you can read the old value back, add a couple to it, and reprogram it.

Not all systems have Read/Write programming. And for those systems that do have Read/Write programming, it must be done on the programming track in Service-Mode Programming. There was no provision made in the NMRA standard and RP for Read/Write in OPS-Mode Programming. However, Digitrax's Transponding system allows reading back in OPS-Mode if the Digitrax decoders support that option. All systems can Write to the decoder. But to Read programming back, you must get a system that supports reading.

The Chief and Zephyr, having a separate programming track outputs, support Read/Write programming. The Empire Builder, having broadcast programming, does not. Also note that the Chief and Zephyr can do Read/Write Programming on the programming track without shutting the layout off. Most other systems I know of, even others with a separate programming track output, must shut the layout down for Service-Mode Programming.

MU Consisting

MU stands for Multiple Unit. An MU consist is two or more locos operating together as one unit. There are three basic methods of consisting with DCC: Basic, Command Station, and Decoder-Assisted.

Basic is where you give two or more locos the same address. When you select that address and give it throttle, all locos with that address will respond together - basically working like putting two or three locos on the track with DC analog control. There are, however, other programming techniques required so one loco can run backwards when the others are going forward. All DCC systems support Basic MU consisting it's basic to the NMRA standards and RPs.

Command Station Consisting, called UniVersal© consisting by Digitrax, is where the command station keeps track of which locos are MUed together. Each loco can have its own unique address so they can be run independently when not MUed. But when MUed to a consist, the command station keeps track of that. And when the consist gets a speed or direction change, the command station automatically sends the correct control packets to each loco in the consist. The consist is broken apart in the same manner it is put together, only in reverse. That is, the last loco MUed to the consist is the first one released from it.

Decoder-Assisted Consisting is where the decoder remembers the consist address. With this, the command station only needs to send one command to the entire consist. This is sort of like Basic Consisting, but can be done on the fly without putting the loco on the programming track. You don't have to re-program the base address back into the decoder when breaking the consist apart. When consisting a loco with this method, the command station sends an OPS-Mode command to program the consist address into the consist memory location (CV#19). When CV#19 has an address in it, the decoder ignores the regular address, in favor of the consist address.

So, when the consist gets a speed or direction change, the command station only sends that change to the consist address - and all decoders with that consist address respond. Breaking the consist apart is done the same way as Command Station Consisting one loco at a time in reverse order. What happens is: the system reprograms CV#19 with a zero. Or, you can put the whole consist on the programming track and program a zero into CV#19 manually to un-consist the whole thing at one time.

There are a couple of advantages to this type of consisting: 1) it only uses one address in the command station - Command Station Consisting uses one address per loco of course, if your system is capable of the total number of locos you want to run, this is irrelevant, and 2) when consisted this way, it stays consisted even when you take it to another layout with Command Station Consisting, those locos are consisted only on the layout they were consisted on.

On the downside 1) it does require a system and all decoders to have this feature if one decoder does not, then it doesn't work except for the Digitrax's systems, which can mix consisting methods, and 2) Decoder-Assisted Consists addresses can be only two digits long a Command Station consist can have a four-digit address (at least on a Chief or Empire Builder).

Using Decoder-Assisted Consisting manually is yet a fourth way to do consisting. It's basically done like Basic Consisting, but programming the consist address into CV#19 instead of CV#1. There are two advantages of this over Basic Consisting: 1) if the system supports OPS-Mode Programming, it can be done on the fly while the layout is running unfortunately, systems that don't support Decoder-Assisted Consisting usually don't support OPS-Mode Programming either, and 2) the consist can be broken up all at once - by putting the entire consist on the programming track and programming a zero ("00") into CV#19 the consist Configuration Variable.

Front and Rear Light Control

With DCC, front and rear light control is all but a given that is, with any decoder or system you purchase, you will have front and rear light control. Not only that, it's constant lighting - even when the loco is stopped.

Most decoders come with front and rear directional lighting. That is, when turned on, the front light will be on when going forward, and the rear light will be on when going in reverse. Optionally, decoders offer more functions even functions that can simulate various lighting effects such as Mars lights, rotary beacons, strobes, blinking ditch lights, and much more.

With directional lighting, you can wire it to be non-directional. But, more importantly, you can also wire it to dim the headlight when going in reverse (something else that is prototypical on some railroads). And, even though it may not be prototypical on the road they're modeling, many people like it anyway because it provides a really great visual feedback as to which way the loco will go when they give it throttle (many people operate without looking at the throttle, so they need this feedback).

Functions

The NMRA standards and RPs make provision for up to 13-functions, FN0 through FN12. These functions can be used for anything on the train that can be controlled electrically. Most often, this is lights. We have customers that go nuts with lights: headlight, rear light, Mars light, roof beacon, number board lights, running board lights, ditch lights, truck lights, and lights in the cab.

However, functions can also be used for many other things it's up to your imagination. We've got a few customers who are controlling couplers, others controlling smoke units, passenger car doors, etc. But the most prevalent other thing people are controlling is sound: horn/whistle, bell, blow down, coupler clank, etc. For functions to work, three things are needed: a decoder with the function to control, a throttle that can control that function, and a system capable of sending commands to that function.

Digitrax decoders come with varying numbers of functions: from the low cost, bare bones, DH123 having two functions (front and rear lights), to G scale decoders having eight functions. Most have six functions. Refer to the product listings elsewhere in this site to find out how many functions each decoder has.

SoundTraxx sound decoders have nine functions FN zero through FN eight. However, most sounds can be programmed to operate with a function different than the one it came from the factory with. For example, coupler clank on a steam sound unit comes on FN7. Note: not all functions can be changed to any other function. There are limitations.

Digitrax's limited throttles (UT1 and UT2) can control FNs zero through five. The DT300 series throttles can control FNs zero through eight.

All of Digitrax's command stations are capable of handling FNs zero though twelve.

Analog Operation

Analog refers to conventional DC analog control. There are two aspects to analog operation in relation to DCC: DCC system control of an analog loco (one that does not have a decoder installed), and DC analog control of a loco that does have a decoder installed. The prior has to do with system capability, the later has to do with decoder capability.

A DC analog loco can be controlled by manipulation of the power on the rails. Most DCC systems make provision for this by selecting address zero "00", and controlling it as if it were a loco with a decoder. Some systems do not have direct provision for this, but can be altered to control one from the command station.

Some manufacturers advertise operation of an analog loco as if that's an expected normal thing to do on their DCC system - makes for good advertising: that you only need one loco with a decoder to have two locos operational. But, analog locos running on a DCC system do not operate as well as locos with a decoder (they don't run any worse than they did on the analog system, but adding DCC to a loco makes it run so much better that you can see a difference especially with lower cost locos), and analog locos make a singing noise when sitting on a DCC layout.

The analog feature is great for two main reasons: to test a new loco before you install a decoder in it, and to allow a friend to bring his favorite loco over to run with yours. I think you'll agree, once you've switched to DCC and see how much better locos run with it, that it's worth the little bit of extra money to have all your locos running on DCC.

Multiple analog locos can be run just like with DC analog systems. Put two locos on the track and they both go together even back-to-back. Because the power on the track is manipulated to make them go, they will both go in the same physical direction just like a DC analog system.

All of Digitrax's systems support address zero "00" operation of an analog loco. Further, you can even MU it to decodered locos with Digitrax's (UniVersal©) Command Station Consisting - providing it runs about the same speed as the ones MUed to.

Some locos with decoders can be run on a DC analog controlled layout. Decoders that have this capability simply look for the DCC packets. When these decoders don't find a packet in the power, they assume they're on a DC analog system and just pass the available voltage through to the motor. The only adverse affect is that all the voltage doesn't come through. It takes two to three more volts to acquire the same previous running speed. Some decoders with this feature can turn this feature off for various reasons.

All of Digitrax's decoders have analog operation. It not only can be turned off, but will use momentum to bring the loco to an orderly start or stop if packets quit. This can be used to make a braking section for red signals.**Turnout Control**

Some systems can control turnouts providing the turnout machine has a turnout decoder connected to it. Further, with some systems, turnouts can be controlled by the hand held throttle, fascia buttons, control panel buttons, and computer all at the same time. So, you don't have to give up one to have one or more of the other control methods. Of course, you can still have ground throws and not have any other control on them at all, if you choose.
While all of Digitrax's systems can access up to 999 turnouts with DT300 or DT400 throttles, UT throttles can access only 99 turnouts.

Turnout Feedback
This is where the position of the turnout is fed back to the command station for viewing on the hand-held throttle or other device such as a computer. There are three ways to have feedback: memory, positive, and exact. Memory feedback is where the system remembers which way the turnout was last thrown. The deficiency with this is that it can only sense when the turnout is fully closed (when it's contacting the switch). When the switch is not contacted, it's assumed that the turnout is thrown. Exact feedback is where you use two switches, one for closed, one for thrown. When neither switch is contacted, the system knows the turnout is somewhere between thrown and closed.

Some systems require a second set of wires for a turnout feedback network. Since all of Digitrax systems use LocoNet, they are all positive turnout feedback capable without adding another network.

Route Control
Route control is where you can set all turnouts necessary to access a specific track on the layout, usually in a yard, with just one button push. In the past, there have been many articles written about how to make a route control matrix with diodes, relays, and all sorts of other schemes. Today, there are several ways to achieve routing without all that hassle.

The Chief has route control built-in for up to 32 routes. All you do is MU (through a different process than MUing locos) multiple turnouts together, telling each one which way to position. Then when you access that route, all turnouts in the list will be set to the position specified in the route.

Digitrax's DS54, turnout decoders, have local route programming. That is, each turnout decoder controls up to four turnouts. You can program a route of these four turnouts, so that when you press the button all turnouts in that route will be set to the position specified in that local route. Further, the turnout decoder can send a route cascade message over the LocoNet to instruct another turnout decoder to throw or close a turnout. The deficiency with these local routes is that they must be activated with one of the local inputs of that DS54 - they can't be activated with a switch command from the hand-held throttle, computer, or any other device.

Today, there are also after market boards, such as Team Digital's SRC8, for turnout and route control. This allows Chief and non-Chief owners alike to have as many routes as they want. Currently, these boards work only with Digitrax (LocoNet) systems. However, Team Digital is working on new boards that will work with other systems as well.Märklin Trinary Control.

This feature isn't of any value to anyone except those who already have Märklin equipment. But, the Chief can control Märklin Trinary locos and DCC locos at the same time, providing a way for Märklin Trinary users to ease into DCC. We have several customers who have done so, and they were all so impressed with how much better DCC runs, they removed their Trinary decoders to replace them with DCC decoders a few at a time.

Command Station Configuration

Like the full-featured throttles, Digitrax's command stations can be configured to operate the way you want. Following are some of the things that can be configured:

1. Auto-reversing: yes or no
2. Command station or slave booster only
3. Motorola Trinary switch packets: yes or no (Chief only: to control Märklin equipment)
4. Motorola Trinary AC digital mobile decoder operation: yes or no (Chief only: to control Märklin equipment)
5. Purge time: 200 or 600 seconds
6. Purging disabled: yes or no
7. Purging beeps: on or off
8. Automatic Decoder-Assisted Consisting: yes or no
9. Short-Circuit Protection time: 1/8th second or 1/2 second
10. Analog loco operation: yes or no
11. Default speed step for first time a decoder address is used: 14, 28, 128, Motorola Trinary (Chief only: for Motorola)
12. Default consisting method for first time an address is used: Command Station or Decoder-Assisted
13. Route programming: yes or no (Chief only)
14. Interrogate turnout feedback on power on: yes or no
15. Track power upon power up: on or off
16. Diagnostic clicks: on or off
17. Track status LocoNet update: on or off
18. Number of addresses: 22 or 120 (Chief only)
19. Braking generator when not programming: on or off (Chief only)
20. Reset command station to factory default

Finale Now, with those descriptions in hand, here's a feature comparison list for the Chief, Empire Builder, and Zephyr.

Feature	Chief	Empire Builder	Zephyr
MSRP	$460	$335	$199.99
Command Station included	DSC100 *	DB150	DCS50
Throttle included	DT400 **	DT400 **	Console
Addresses available	0-9983	0-9983	0-9983
Number of addresses run at once	120	22	10
Number of throttles	120	22	10
Number of functions	9	9	8

Fast Clock	in throttle (std) and/or on wall (option)	in throttle (std) and/or on wall (option)	on wall (option)
Knob control type	Digital Encoder	Digital Encoder	300-degree pot
Throttle Configuration	Yes	Yes	Yes
Other throttle types available	All LocoNet	All LocoNet	All LocoNet
Radio available	Yes	Yes	with Full-Featured
Infrared available	standard	standard	with Full-Featured
Mix throttle types	Yes	Yes	Yes
Throttle Network type	peer-to-peer	peer-to-peer	peer-to-peer
Speed steps: 14, 28, 128	All	All	All
Mix speed step types	Yes	Yes	Yes
Addressing: Two- and four-digit	Both	Both	Both
Rostering	Yes	Yes	No
Analog Loco Control	Yes	Yes	Yes
Turnout control	999	999	999
Route programming	Yes	No	No
Turnout feedback	Yes	Yes	Yes
Command Station Consisting	Yes	Yes	Yes
Decoder-Assisted Consisting	Yes	Yes	Yes
OPS-Mode Programming	Yes	Yes	Yes
Read/write programming	Yes	No	Yes
All forms of Service-Mode	Yes	Yes	Yes
Separate programming track output	Yes	No	Yes
Programming with layout running	Yes	No	Yes
Computer control	Multiple	Multiple	Multiple
Märklin control	Yes	No	No
Brake generator	Yes	No	No
Transponding	Yes	Yes	Yes***
Command Station Configuration	Yes	Yes	Yes

Notes:

* Unless the eight-amp Chief is ordered, which comes with a DCS200 (eight-amp booster) instead.
** Unless ordered with a DT300, or with a radio system.
*** The Zephyr can handle transponding, it just can't display it. A DT400 can be added to the Zephyr to get and display transponding info.

Now all you have to do is make your list of features that you want, then find the system that best suits those needs. The important thing here is that you know what a feature is before you include or exclude it. I can't tell you how many people wished they had learned more about one feature or another before buying their system.

One thing to remember about choosing a system is this: the only way to gain features that are part of the command station, is to get that system. That is, if you buy an Empire Builder, the only way to obtain Read/Write programming is to get the Chief Command station. Be sure to start with the system that can do everything you want. Except for those features, everything else can be added on later.

For example, the number of turnouts the system can control is part of the command station. So, if the command station can support it, all you have to do to gain turnout control later on is to add DS54 turnout controllers. Likewise, multiple computer control is supported by the peer-to-peer LocoNet network, so all you have to do is to add an MS100 computer interfaces for each computer you want to add.

To help you with this, the following list tells you what components are required for each feature listed above:

Feature	Determined by:
Number of addresses available	Throttle and Command Station
Number of locos run	Command Station
Number of throttles	Command Station
Number of functions	Command Station and Throttle
Fast Clock	Throttle/Throttle Network (for Digitrax)
Knob control type	Throttle
Throttle Configuration	Throttle
Other throttle types available	Manufacturer
Radio available	Manufacturer
Infrared available	Manufacturer
Mix throttle types	Command Station and Throttle Network
Throttle Network type	Command Station
Speed steps: 14, 28, 128	Command Station
Mix speed step types	Command Station
Addressing: Two- and four-digit	Command Station and Throttle
Rostering	Throttle
Analog Loco Control	Command Station and Throttle
Turnout control	Command Station and Throttle
Route programming	Command Station and Throttle
Turnout feedback	Command Station and Throttle network
Command Station Consisting	Command Station and Throttle
Decoder-Assisted Consisting	Command Station, Throttle, and Decoder
OPS-Mode Programming	Command Station, Throttle, and Decoder
Read/write programming	Command Station and Throttle
All forms of Service-Mode	Command Station and Throttle
Separate programming track output	Command Station
Programming with layout running	Command Station
Computer control	Throttle Network (Command Station with some)
Märklin control	Command Station
Brake generator	Command Station
Transponding	Throttle Network and transponding hardware
Command Station Configuration	Command Station

One thing to keep in mind when comparing systems with information provided by dealers that carry several brands is: they too are not likely to be "expert" in "all" systems. So they may be providing you with information slanted to sell you the system they want to sell you. Are they pushing one system over another because they truly think that's the best system for you? Or are they pushing the one they happen to have in stock, the one they are over stocked in, the one they make the most profit on, or some other reason?

So, be careful. Before you let any dealer sell you another system, be sure that you have the straight scoop on the Digitrax system they are steering you away from. If that dealer is telling you something about Digitrax to steer you away from Digitrax, check to be sure what they are telling you is correct before you eliminate Digitrax as a choice.

Note: we could specialize in any system we want. In fact, we did sell other systems in the past. But we decided early on that Digitrax is not only the best for the money, but the best period at any price. With all that these systems can do, total versatility with mix-n-match between all of their systems and equipment, and total open-endedness of LocoNet, there's just no end to what can be done with it in the future.

This doesn't mean you have to learn all this functionality all at once. You can master all the Digitrax basics as easily as you can with other systems that can't do nearly as much. You only need to learn about Route programming, Rostering, etc., when/if you decide to use those features. While you don't have to think about hig-end features now, isn't it nice to know they are there when you're ready for them?

Anyway, when comparing prices between a Digitrax system and other brands, be sure you are comparing systems with as close to similar features as possible. For example, you wouldn't compare the price between the Lenz Set02 and Chief because they are not anywhere close to being equal systems. That would be like comparing the price of a Volkswagon to a Cadillac.

First, compare the Lenz Set02 features with those of the various Digitrax systems. You won't find a Digitrax set with the exact same features of the Set02, so you'll have to find the one comes closest in the feature set you want, then compare pricing between those two.

Now, I'm not saying that Digitrax is for everyone. There are reasons why some people might want another system (I once sold a System One to a guy who thought it would enhance the look of his layout). But, with the variety, versatility, features set, power, and pricing, most people will find one of Digitrax's systems to be most attractive.