



# Ready, Set, Go!

The myth of DCC Ready



## DCC Impulses Column

by Bruce Petrarca

photos by the author, unless otherwise specified

## Your guide to the terminology.

First off this month, let me apologize for a change in my website. Just as last month's column was going to print, I found that I needed to change my website authoring software. The new software wouldn't handle file names longer than 27 characters. There were a few things that the new software won't accommodate in file structure, too. So, some things had to change. This may mean that your old links to my site won't work. I suggest that, if you are having issues, you go to the homepage ([www.MrDCCu.com](http://www.MrDCCu.com)) and navigate from there. Save your new links. I expect this format to be stable for two or three years, at least! I took this opportunity to freshen the site's look. I hope you like the new look.

MRH columnist Richard Bale asked me about the confusion over "DCC Ready" type nomenclature on locomotives. I decided that it was a deep enough subject to warrant a column, so here goes.

I did a clinic at a lot of NMRA conventions up until about 5 years ago, entitled, *DCC Ready? The Good, The Bad, and The UGLY!* In it, I dealt with the state of DCC awareness at that time. On my website (<http://www.mrdccu.com/curriculum/ready.htm>), I have a page about the subject. This page has a link to the presentation from my NMRA clinic for a historical perspective. You may wish to detour there before going further in this column.

First, let me state that things are getting better. A decade ago, the terminology was very confusing as manufacturers scrambled to be able to claim some level of DCC awareness. Alas, many of these locos are still on the shelves, so the watch phrase is “caveat emptor”: buyer beware.

## Terminology

I’m going to define what I feel are correct categories and then work forward with what is on the market to fit MY criteria! This is MY terminology, not some bureaucratic definition.

## DCC Installed



### 1: Blackstone HOn3 loco designed by the SoundTraxx folks Photo courtesy of Blackstone Models

This means that there is a DCC decoder in the loco as it comes from the manufacturer. It may be a motor and light decoder; or a decoder for motor, lights and sound.

Frequently, although the loco packaging sounds as if it features a name-brand decoder, it may be a downgraded version. Some loco manufacturers order special decoders from the well known sound decoder manufacturers, but with reduced features to reduce cost. Most times, the manufacturer won’t tell you about the downgrade on the box.

Bucking that trend are the Blackstone (1) locomotives. Since they were designed by the folks at SoundTraxx, they have full featured Tsunami decoders in the models that are “DCC Installed” and the box clearly says “Tsunami Installed”.

A prime example of the downgrade are the Bachmann locos sold in the 2010 timeframe that were marketed as having “Tsunami Technology”. Yes, the decoders were manufactured by SoundTraxx, using “Tsunami Technology” in terms of the sound recording quality. However, Bachmann asked SoundTraxx to work to a budget. That required a less expensive microprocessor and memory chip. Features were sacrificed on the alter of price. Some folks refer to them as “Pseudonamis”. I must, however, give

credit to Bachmann. They didn't say that they had Tsunamis in them. The box said that the locos had "DCC sound on-board".

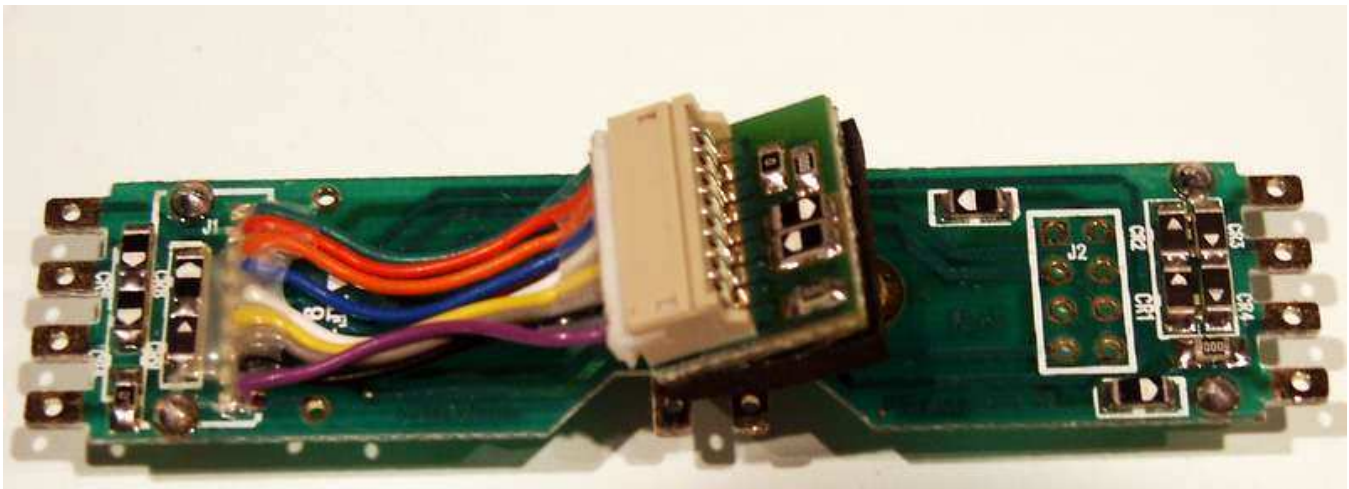
I have a garden scale (Fn3, 1:20.3) Bachmann Shay that fits into this category. Even though Bachmann put switches in the top of all three cylinders to activate a chuff sequence, they didn't pay SoundTraxx to put the feature in the "DCC sound on-board" decoder. There is no way to add this feature to the decoder. I'm stuck with a loco that has to rely on auto-chuff, even though it has the hardware to have a synchronized chuff. This is in a loco with a list price about \$1000.

In the world of non-sound decoders, the manufacturers frequently don't spring for the top of the line decoder, either.

In summary, if the manufacturer says that the loco has "DCC Installed", expect that the loco will operate on DCC powered track, but don't expect a top-of-the-line decoder.

## DCC Ready

This term occasionally confuses folks. When a loco says "DCC ready", the manufacturer usually means that it is easy to install a decoder into the loco. They don't mean that the locomotive is ready to run on a DCC system.



### 2: Light board from Athearn Ready-to-Run loco

About eight years ago, I had a customer purchase a Bachmann N-scale loco that was advertised as "DCC ready". He brought it to me to install a decoder. I looked inside and didn't find what I really expected, like a socket. So, I called Bachmann and asked what decoder to use. They gave me a part number for an HO-scale decoder. I pointed out to them that the part number I gave them was for the N-scale version of that locomotive. I asked what N-scale sized decoder to use. There were a bunch of "hand over the microphone" questions flying around in Philadelphia. The tech support person came back on the line and said that there was no decoder available for that loco. I again pointed out

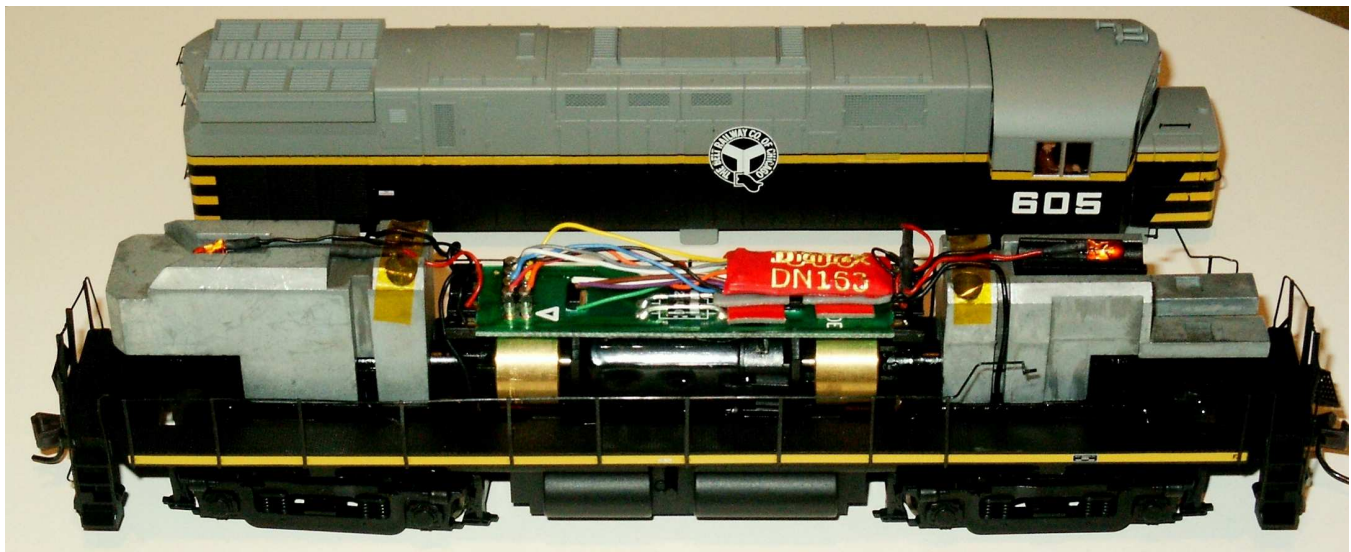
that their box said, “DCC Ready”. The reply has me laughing to this day: “Well, it is READY for you to put a decoder into it.”

Okay, on that basis, every locomotive ever made is “DCC Ready”.

My definition is a bit less inclusive. I feel that a customer has the right to expect a loco sold as “DCC Ready” to have a socket in it that will accept decoders manufactured by more than one company. Once the decoder is plugged in, the loco will function without loss of lighting functions or control. Converting the loco to DCC by plugging in the decoder should not increase the risk of damage to the loco. Likewise the resulting installation should not risk damage to the decoder.

Someone with no electronic experience should be able to remove a couple of screws, remove the shell, remove a connector and plug in a decoder that is available from many manufacturers. If a loco, marketed as “DCC Ready”, fails this test, it belongs in either the “DCC Aware” category or the “DCC Ignorant” category.

Figure 2 shows the Athearn Ready-to-Run light board (outside of a loco). Once you remove the shell, you see this on top of the motor. You simply remove the (white) JST plug and adapter board and plug in the JST decoder of your choosing. Almost every DCC manufacturer makes JST (9-pin) connected decoders.



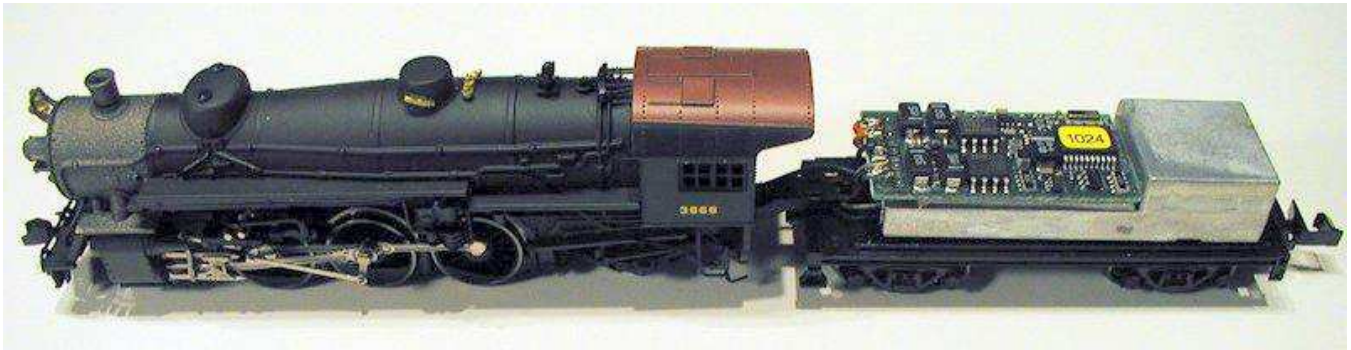
**3: Digitrax DN163PS decoder installed in an Atlas C424**

Another example of truly “DCC Ready” is the Atlas C424 in figure 3. After removing the shell, installation is simply a matter of plugging the decoder into the NEM-652 (8-pin) socket.

## DCC Aware

The next level is what I call “DCC Aware”. By this term I mean that the manufacturer was aware of the needs of DCC and designed their product for easy decoder installation.

Things like easy access to the wiring and total motor isolation go a long way toward filling this bill. Isolated light wiring helps, too. NMRA DCC color code compliance is the icing on the cake.



### 4: Model Power N-scale steamer has room for an HO-sized decoder

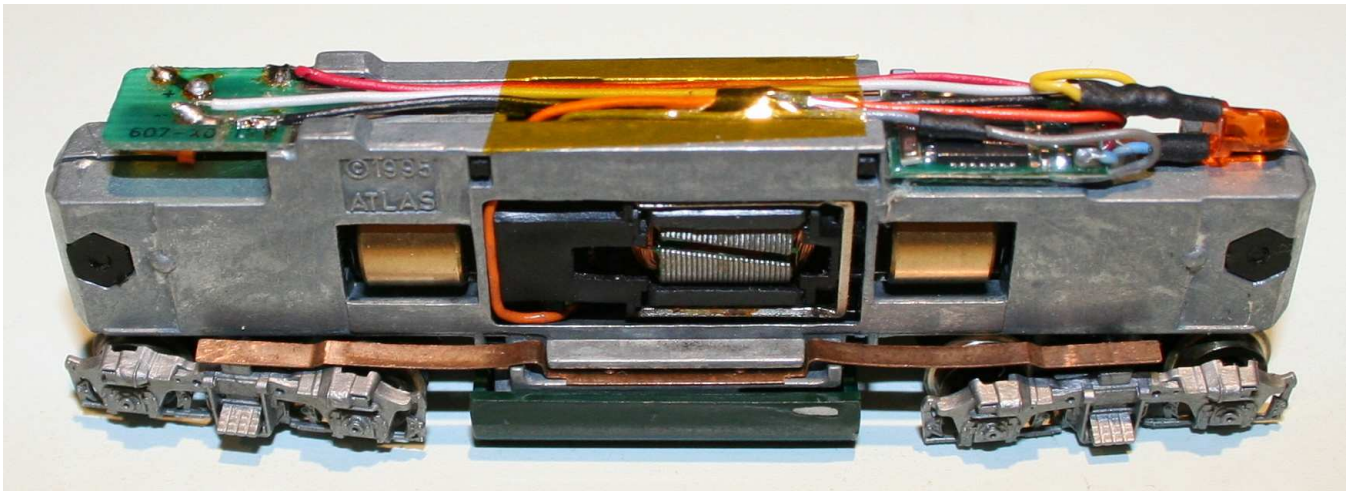
For example, I rate the N-scale Model Power steamers released about 8 years ago about 80% DCC aware. Figure 4 shows a Lenz (HO-scale) LE1024W decoder installed in one of these locos. They have an easy to remove tender shell. Inside, there is enough room for many different N- and Z-scale decoders. They even have NMRA color coded wires for the motor and track connections. All one need to do is clip the splices off and wire the decoder, matching the colors. Why do I say 80%? Well, you may have noted that I didn't mention lighting wires. The headlight is wired to the track pickup in the loco. To add on/off capability for the headlight requires extensive disassembly of the loco itself.

I expect that locos in this category require a bit of disassembly and soldering to install a decoder and make the lights work on DCC.

## DCC Ignorant

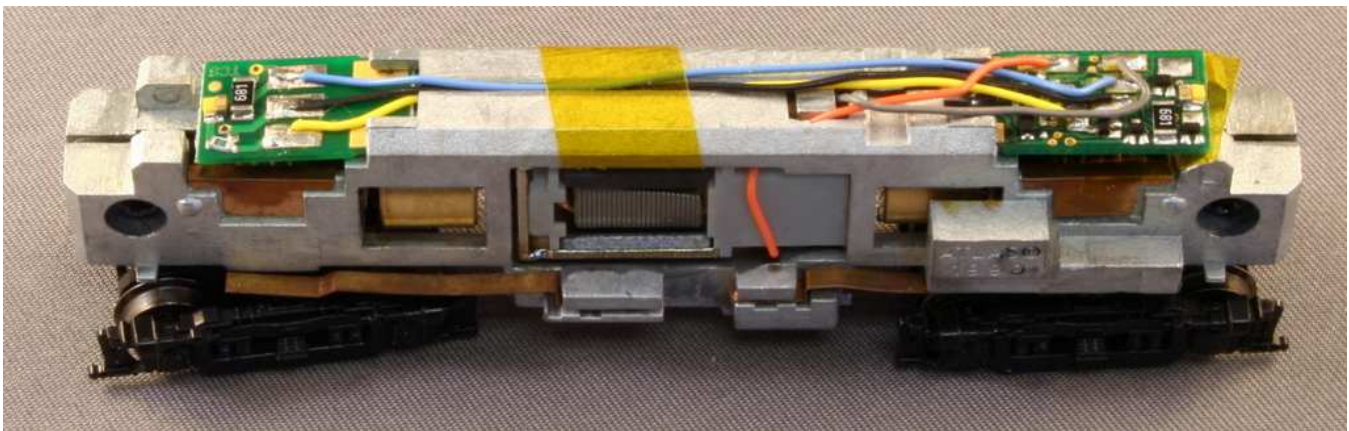
I can come up with lots of examples of locos that were designed without a clue about DCC. In all fairness, many of them were designed before the NMRA embraced the Lenz patented DCC. However, command control systems that need to be inserted between the power pick-up and the motors have been around since the 1980s. So, while the designers of “DCC Ignorant” locos may get a bit of forgiveness, there is no absolution for them.

Most prevalent of the “DCC Ignorant” locos are the split frame designs. Here each half the frame is connected to a rail and the motor is cradled between the halves, making contact with both. This design is reliable and cost effective, just a pain to put a decoder into. Add to the mix the fact that these are frequently small locos, like N-scale or HO-scale switchers, and the installation gets even more difficult.



### 5: Atlas N-scale GP9 with a Lenz LE0521 decoder

Figure 5 shows a 1995 vintage Atlas N-scale locomotive. I was most successful using DCC ready frames (<http://www.aztectrains.com/dccframes.html>) from Aztec Manufacturing. This involved breaking the loco down to the two pieces of metal that make up the frame. These two pieces get sent to Aztec, where they are exchanged for pre-machined parts that they stock. The loco is then rebuilt from the ground up. This makes for a very complicated installation and adds time and money to the process.

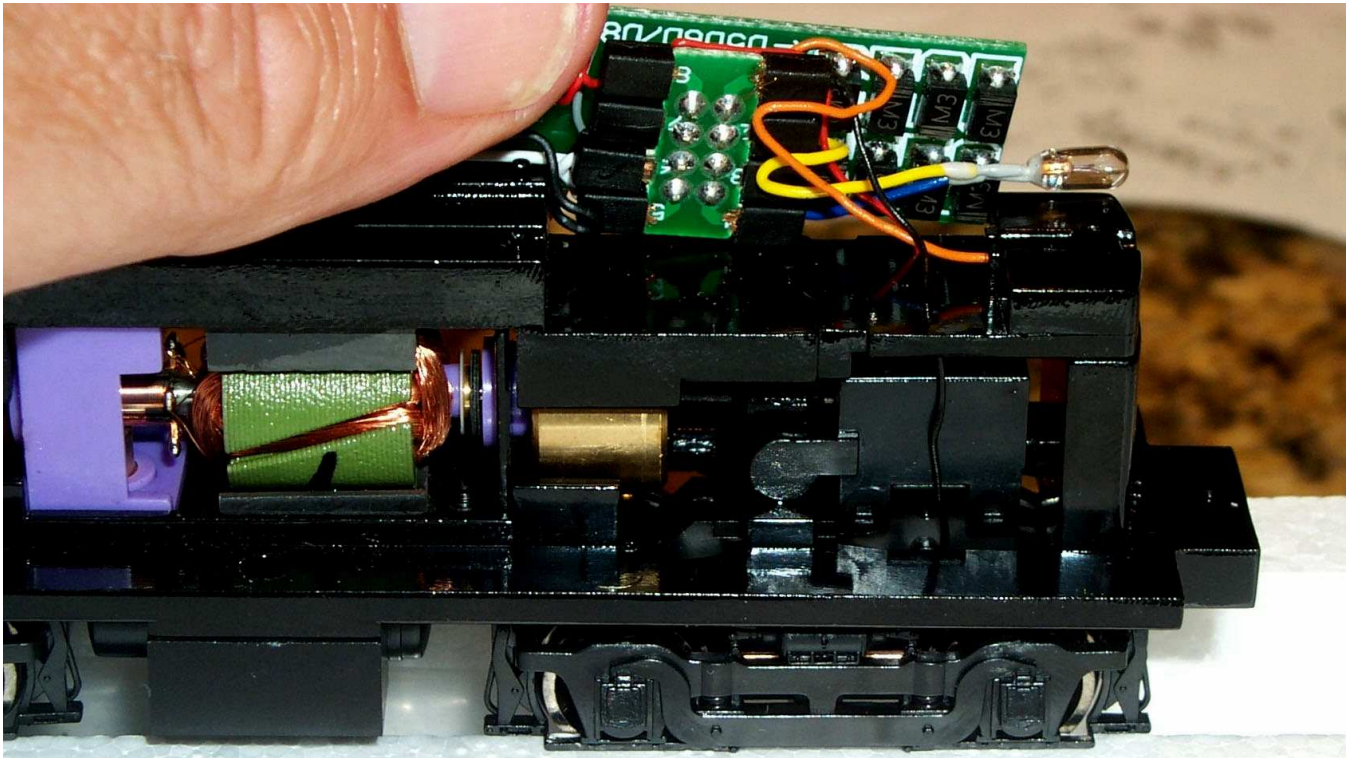


### 6: TCS CN decoders overcome some of the ignorance

Where there is an issue, the market builds a solution. With smaller electronic parts, TCS designed their CN series decoders to replace the light boards on both ends of many N-scale diesel locos. This removes the need for machining the frame, but still requires that the loco be completely disassembled to isolate the motor from the split frame. Figure 6 shows one such installation in an Atlas RS3.

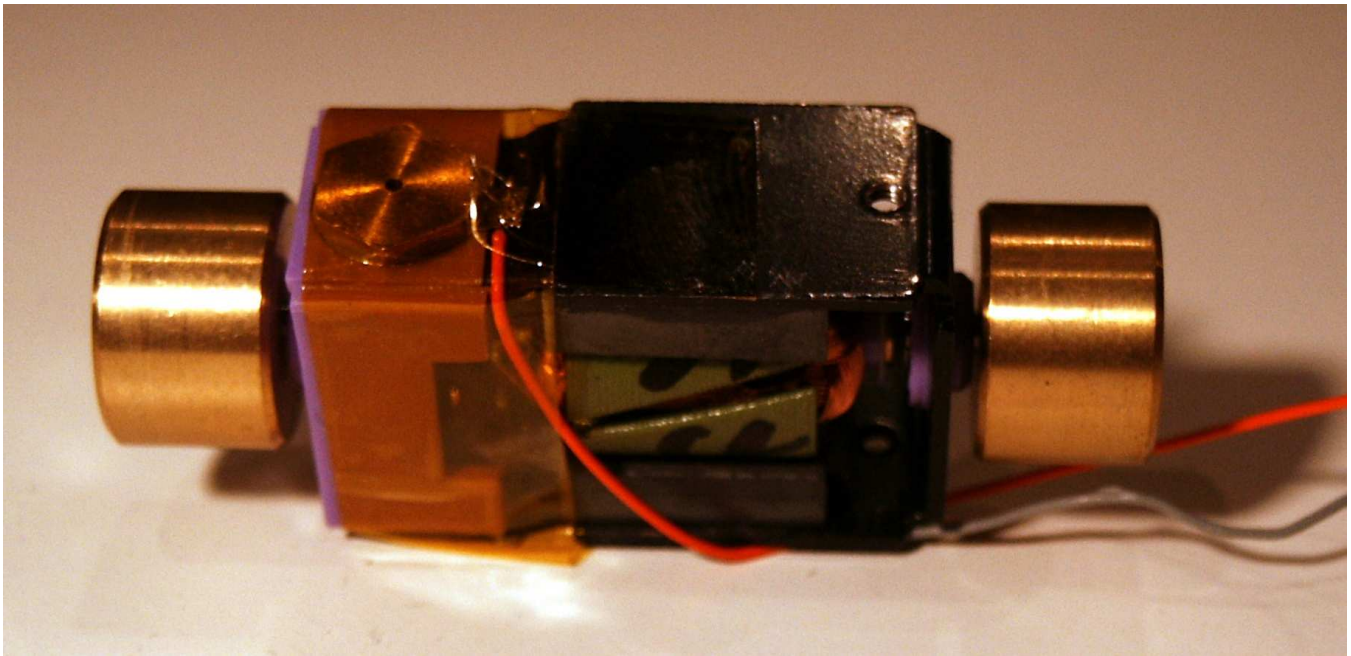
The Kato HO-scale NW2 is a prime example of one designed before DCC became popular. The installation of sound in this loco was the subject of my January column ([http://model-railroad-hobbyist.com/magazine/mrh-2013-01-jan/di\\_dcc-sound](http://model-railroad-hobbyist.com/magazine/mrh-2013-01-jan/di_dcc-sound)) and a companion video.

An example of a loco that is marketed as “DCC Ready” that should be “DCC Ignorant”, in my mind, is the Life-Like Proto 2000 HO-scale S1. Later runs of this loco had a DCC socket.



### **7: Life-Like Proto 2000 S1 (HO-scale) light board and DCC socket**

You can see (7) this series of loco as delivered. It has a socket, all right, but precious little little room for a decoder. The light bulbs are 1.5 volt, so if you plug a decoder in without changing them, their life will be a fraction of a second. Also, the orange motor lead is routed through the frame to the bottom brush on the motor. You may find a decoder that will fit and plug in. However, if the frame ever touches an energized rail you will probably blow the decoder.



**8: Life-Like Proto 2000 S1 (HO-scale) motor after insulation – bottom view**

So, my solution is to tear everything out, insulate the motor (8) and hard-wire a decoder and two LEDs. Somehow, this makes their “DCC ready”, claim seem humorous. That is, unless it is you the one stuck with the loco and you don’t want to do that much work.

## **Sound Installation**

I find that most locomotives are not “DCC Ready” for sound installations. Usually there isn’t enough room for a socketed decoder and a speaker and still be able to get the sound out. See my August 2012 column ([http://model-railroad-hobbyist.com/magazine/mrh-2012-08-aug/dcc\\_impulses](http://model-railroad-hobbyist.com/magazine/mrh-2012-08-aug/dcc_impulses)). Sound installations seem to fall somewhere between “DCC Aware” and “DCC Ignorant”.

## **What can you do to protect yourself?**

My primary recommendation is to deal with a DCC-savvy dealer. If you have one, rely on their recommendations. Tell them what your end goal is (DCC, sound, etc.). Follow their recommendations. If they steer you wrong, they should be willing to make things right. If your dealer isn’t DCC-savvy, then you need to be, or take a friend who is. Get them to open a loco before you purchase it. Check it out. Look for: DCC socket, room for decoder, and LEDs. These usually mean that you can plug a decoder in and go.

## **Swap meets**

You are never certain what you get at a swap meet, unless you know the seller very well.

Be aware of locos that already have decoders installed. Who did the installation and what were their workmanship standards? If it isn’t a very recently released locomotive, what

generation of decoder is installed? Decoders evolve. Three year old decoders are frequently not on par with current offerings.

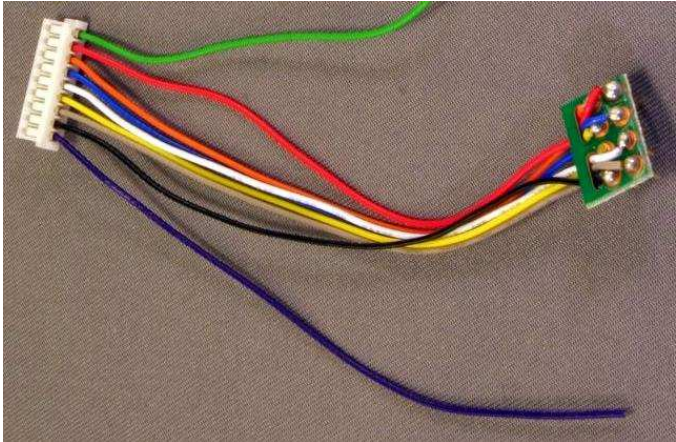
Hopefully, this will help folks better understand what to look for when purchasing a locomotive. If you liked this column, please click on the Reader Feedback link here and rate it **awesome**. Please join in the conversation that invariably develops there about the topics presented in the column. Share your experiences. I expect this column to generate some lively discussions there. Thanks.

Until next month, I wish you green boards.

## From Mr. DCC's workbench

### Adding a 8-pin harness to a JST style decoder

Okay, you have a locomotive with an 8-pin socket and a decoder with the 9-pin JST connector. How do you install the decoder easily?



#### 9: JST to NEM-652 harness (9-pin to 8-pin)

The easiest answer is use a conversion harness of the minimum length needed to make your installation. Several manufacturers make these harnesses in a variety of lengths from fractions of an inch to several inches.

That's fine, but what if your decoder, such as the SoundTraxx Tsunami TSU-1000, has shrink wrap over the JST socket? Carefully remove the shrink wrap (10) and unplug the JST harness. Plug in the JST to NEM-652 harness of the appropriate length.

Figure 10 details the steps to remove the heat shrink tubing. Working from the connector side of the decoder, not the flat side, carefully cut into the shrink in the middle of the JST connector. Then peel the heatshrink back, being careful not to dislodge the heat sink (if there is one).



#### 10: Removing heat shrink to allow the JST connector to be removed