DCC PRIMER

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What does DCC stand for?

DCC is short for **DIGITAL COMMAND CONTROL**. It is not just another method of control, it is a standard for manufacturers to use to make their products compatible with other products on the market that meet this standard. In this respect, the playing field has been leveled and we can begin to reap the benefits of controlling things that we have never been able to control before.

The DCC signal is an alternating DC waveform, which contains the digital information, This coded signal controls a specific decoder placed in a specific locomotive causing it to use as much of the track voltage as it needs to move forward or backward, turn its headlight on or off or even dim it for meets with other trains on another track. Decoders can be set so that locomotives that could never have run together with a conventional power pack can doublehead or even operate in pusher service without one of the locos working too hard or not hard enough. Many of the newest locomotives have light boards that can be removed, and a decoder added in the same space.

Block Wiring (no switches) **may** still be required for proper power distribution, and/or detection & signal systems to function properly. However, in many cases block wiring and all of those block switches will no longer be necessary. Slow speed operation and switching moves may be improved and constant lighting becomes easy. You can control onboard sound systems and have flashing ditch lights and markers; all of the above or as many as you wish.

You may control more than one train or device with only one controller. Device? Yes, it doesn't have to be a locomotive, it could be a crane on the rails or in a nearby junk yard or at a construction site. How good is your imagination?

Programming of the systems and decoders depend upon the complexity of the system that you have. Decoders are dropping in price and many locomotives are coming with **NMRA DCC** compatible sockets already in place to accept a decoder. Each decoder has an address and will only read signals that match that address. Digital because they are digital packets. Command because you use those packets to send commands to the decoder. And control because that is the result.

Why go to DCC.

As a DC owner/operator, would you like any of these features when operating your trains on your personal or club layout?

- Individual loco control?
- Operation more typical of the prototype?
- No block controls – and no more "who's got my train"?
- Easier wiring?
- Better motor performance by "tuning your locos"?
- Walk around capability?
- Sound in your existing locos?
- Lights effects that can be selected off/dim/on and at a constant intensity and on even when the loco is stationary?
- Do you want to operate trains and not your layout?

If you answer yes to a few of these, then DCC is for you. The benefit that each modeller gets from DCC will vary, depending on the:

- Type of layout they have – shunting/operations or mainline running.
- Size of layout.
- How they operates it – from one central point or walk around.
- What effects they want out of their locos – lights, sounds etc.
- The amount of locos operated.
- The number of operators.

DCC is not for everyone. Some model railroaders are happy watching trains go around the layout and don't consider operation as a part of the running session. What someone sees as a priority, others may not? It is all about choice.

There are hardly any choices with DC but DCC has many.

I have mentioned some of the benefits of DCC, and YES they do come at a cost. These include:

- Purchasing a DCC system ranging from $100 to $1000 plus.
- Purchasing decoders for each operating loco. These range from $30 – 70 non sound and $75 - $300 for sound.
- Increased price of a RTR loco with the addition of sound or a "chip".
- Time and effort to fit decoders to each loco.
- Yes – I can hear you say, "I'll have to fit decoders to all of the 200 plus locos that I own- that's going to cost me heaps.
- Don't think of it like that. How many of those do you operate now? Fit decoders into your popular ones first.

So now how many do you have to chip? Fitting decoders to locos is so much easier now. The size of decoders is getting much smaller, more features and cheaper. A small HO decoder is the size of your thumb nail. How easy will this be to fit?

Manufacturers are now providing locos that make it all that easier to go DCC, when purchasing new models. They are:

DCC Ready locos that have all the loco wiring terminated (for HO) with a NMRA 8 pin socket that makes installing a decoder really easy. Another benefit, there is room for the decoder and this is important if the loco is manufactured with a large weight as many are these days.

DCC Equipped locos that come with a decoder already fitted and ready to run. There are a number of manufacturers making RTR sound locos, for example Atlas, Athearn, Broadway Limited, Intermountain, just to name a few. When the installation of the decoder and/or sound is done by manufacturer, it is so much cheaper then adding sound yourself, although you may not get the best sound system for your money. Remember, you get what you pay for! To add a good sound decoder and speaker will cost you upwards of NZ$145 and you will have to spend hours, fitting it and "grinding" some weight out to find room for the "chip" and speaker, depending on weather it's a steam or diesel installation.

Once you have operated on a DCC layout, you will NEVER operate on a DC layout again, by this I mean **operation,** not just running trains around the layout.

It really is about CHOICE, what YOU want from your hobby. Control of our locos and what we "want" out of them (lights, sound etc) is only a part of this

wonderful hobby. Some modellers spend a great deal of their hobby hours building beautifully detailed models, while others make wonderful scenery etc. There still is only 24 hours in a day. DCC is NOT the only way to control a layout, but it does provide a system of control that far outweighs DC in all respects, but if you are willing to pay for the difference, that is your decision - ONLY yours.

Choosing a DCC system.

Every one of us has to go through this process. You can spend a lot time researching a lot of sites, joining Yahoo Groups following the discussions and searching the archives for information etc to help you choose a system. If you have not had any experience with DCC, then all this research and reading could only confuse you. How do novices understand technical stuff by just reading? It is very difficult choosing a system via the Internet. Use these sites to help you decide. See below for the most important criteria for choosing a DCC system.

A couple of typical questions commonly asked at Yahoo Groups are:

- Why should I buy "X" system over "Y" system?

- What do you find the best about your system? etc.

The members of these groups are mostly operators of those systems and can be a little biased towards their system and mostly will not say anything detrimental about it. We are on a whole, normal people.

Basically all DCC systems do the same thing, they offer:

- Independent control of trains.
- Provide better loco speed control with the ability to tweak locos for even better performance.
- Allows for operation more similar to the way a prototype operates.
- The necessity of wiring in blocks is eliminated. Easier wiring of the layout.
- Allows for many lighting effects to be used that can be turned on and off.
- All lights, when wired up correctly, have constant brilliance.
- Allows for the fitting of sound into our existing locos.

- Operating a DCC layout is so much more rewarding with the above features.

Where the DCC systems are different, is how they do all of this:

- The amount of locos that can be "run".
- How many throttles.
- Built in or walk around throttles.
- How they do "Addressing"
- Programming features.
- Options.
- Whether "starter" systems can be expanded when your requirements grow.
- and of course price.

As with all products, the cheaper systems have obviously less features and options. The more expensive has more flexibility, features and options.

A very important thing to consider when purchasing your system, the system is just the first item but only a small proportion of what you may spend on you DCC "expedition". Considering price is thus not as important as purchasing a single item. This is not say, not to consider price, just to put it in perspective and for this reason, I would recommend not to "skimp" on the system.

You should also consider:

- Are you in a club?
- What if any DCC system do they use?
- Club members have a reason to "stick together" as more throttles are needed, the more members there are. This should not be the only reason to purchase a similar DCC system.
- Do you have a local dealer?
- Do any of your friends have a DCC system?

Going alone with new technology can sometimes be daunting, to say the least and these above question items will provide a "local base" of operators. All of us need some help at the beginning.

What I see as the most influential reasons of completing your "choice" is to consider this.

- How the throttle feels and operates for you? This is your interface to your trains, so it is important.
- What sort of layout do you have and how do you operate it?
- Does it need walk around capability?

There are many people using DCC now and many hobby shops that stock the systems. The most important factor for choosing a DCC system, and this can only be achieved by operating the DCC systems on your "Short List" and do some of these operations.

- Select a loco.
- Make up a Consist.
- Do some programming.
- Ask some question to the owner/operator.
- How does the throttle feel to you?
- Are you comfortable using it?
- Is it too complicated to you? Remember it will become easier after using it for a while.
- Does the throttle and system have easy to follow display, menus and prompts? Is it "intuitive"?

There is a saying on the DCC groups.

"There is NO best DCC system, just the one that is best for you".

Join Yahoo Groups and Wiring for DCC.

Yahoo Groups is a great chat room, for the name of a better phrase, for all and sundry to join. There are thousands of groups and if you browse these groups you will be surprised how many strange people there are in this world. If you use Yahoo groups for your benefit, you can get a great deal of information about your great hobby. This is what we are interested in, joining related model train/railroad groups where the members are like minded people modelling railways.

You will have join **Yahoo Groups.** You will be asked to create a Yahoo Identity. This is private and confidential but will be used in correspondence that you have

with the Yahoo groups. You will need to create a Yahoo name and a password. You can view you emails at Yahoo.

Go to the sub Group **Hobbies & Crafts > Models > Trains and Railroads** and you can browse the groups and join the ones that you are interested in. A word of warning, joining more than a few groups and you will find you spend to much time on the computer and less on your layout. I am a member of NCE –DCC group plus many others including Soundtraxx, JMRI users (Decoder Pro), QSI etc to name a few.

Allan Gartner's **Wiring for DCC** is a fantastic site for all sorts of information about DCC, wiring your layout etc' Join this group and ask questions.

Don't join all the groups I have, otherwise you'll never get anything done. I love learning and this allows me to help. I enjoy answering if I can. One thing I have seen in these email lists is that it is easier for people to post an email than look up a manual and try to find the solution themselves. Please don't fall into this trap. You will learn about your system and DCC in general by trying to resolve your problem first. This does not mean, don't post messages, but try first then post. Gee, I have posted many questions, but not without trying to rectify it first.

See how you go. If you need some help, there is plenty at Yahoo Groups, Wiring for DCC and here.

I'll see you posting some messages soon.

Books on DCC.

There are three excellent DCC books available from hobby shops and the Internet:

- DCC Made Easy by Lionel Strang.

- DCC Projects and Applications by Mike Polsgrove – Model Railroader DCC Corner fame.

- Digital Command Control – A comprehensive guide to DCC by Stan Ames, Rutger Friberg and Ed Loizeaux.

All of these are very worthwhile reading for entrants into the DCC world. These books explain what DCC is about, in a not too technical a description and explain how to wire a layout up with DCC. Included are descriptions of the DCC systems components including: Command Stations, booster, throttles, power bus wiring etc.

I find that Lionel Strang's book – DCC Made Easy, is easier to understand. Mike Polsgrove's "DCC Projects and Applications is a great follow up to DCC Made Easy. These two books are essential DCC reading and should be on everybody's work bench.

Digital Command Control was written by members of the NMRA DCC Working group that implanted certain Standards and Recommended Practices RPs. that are necessary for the continued success of DCC. What these Standards & RPs gives us is "commonality" at the rails. In essence, this allows ANY DCC system to control ANY brand of DCC decoder.

Don't forget the golden rule; - if you don't know then ask – someone will know the answer.

Information gathered from several places with special thanks to Marcus Ammann's helpful pages and NMRA site.

More information can be found at:
  http://www.thetraindepot.co.nz
  http://www.nmra.org/
  http://www.members.optusnet.com.au/nswmn2/DCC.htm
  http://groups.yahoo.com/
  http://www.wiringfordcc.com/track.htm

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