

Improving a Decoder Tester

Wil Davis

Those who attended the July meeting, where I talked about installing decoders, may recall I said I had purchased a low cost decoder tester at the NMRA NTS in Atlanta. A decoder tester was something I had pondered acquiring for some time, but wasn't sure I needed one. Several times I had attended a presentation, including the NMRA convention, where the ESU decoder tester had been recommended. It is a top of the line tester which includes a motor, a speaker for testing sound decoders and three different plugs for testing various decoders.



The advertisement features the NCE logo at the top, with a black decoder tester unit in front of the letters 'NCE'. Below the logo is the slogan 'The Power of DCC'. The product name 'DTK DCC Decoder Test Kit' is prominently displayed. A photograph of the circuit board is shown, with various components labeled such as 'TRACK', 'FORWARD', 'REVERSE', 'MOTOR', and 'DECODER TESTER'. The price '\$24.95' is listed below the board. A bulleted list of features is provided, including compatibility with any DCC decoder, test track power, and the ability to program without a decoder. A barcode with the number 05240219 is at the bottom, along with a warning label about chemicals and an age recommendation of 14+.

NCE
The Power of DCC

DTK
DCC Decoder Test Kit

\$24.95

- Perfect Companion to DCC Installation and Operation
- Works with ANY DCC Decoder
- Test Track Power
- Program without the Decoder in the Engine
- Indicator Lights for Motor Forward and Reverse
- Indicator Lights for Functions 0F, 0R, 1, and 2
- Can Test Accessory Decoders
- Add an Optional Motor for under load Testing

Age 14+

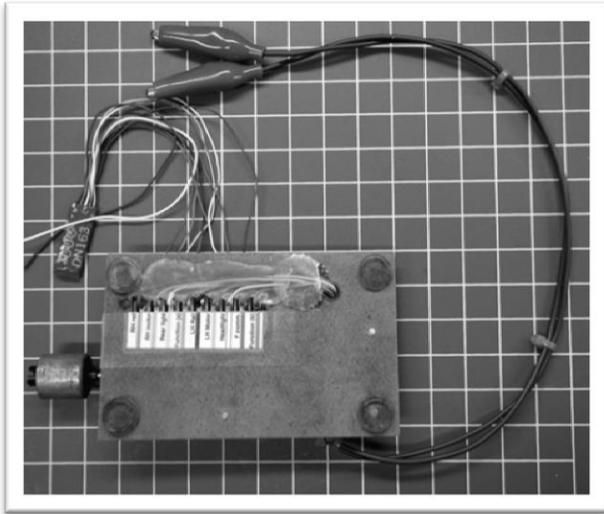
05240219

Warning: This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

Being frugal, I had started to gather the components to build one that was described in a Railroad Model Craftsman some years ago. It did not include a speaker or a motor, but had a terminal strip for connecting universal decoders and a NMRA eight pin plug. After hearing the presentation in Atlanta, I decided I should just go ahead and bite the bullet and buy the ESU unit. So Saturday morning, just before leaving to come home, I went back to the Train Show and headed to Tony's Train Exchange as I knew they carried the ESU decoders and supplies. When I asked about purchasing one of their decoder testers, they said they didn't bring them to the show, but they had a NCE tester (which was less than half the cost of the ESU tester). I briefly thought about it and figured I had put off the purchase long enough, and if I waited until I got home to order one I might continue to put it off. I went ahead and purchased the NCE DTK unit and headed home.

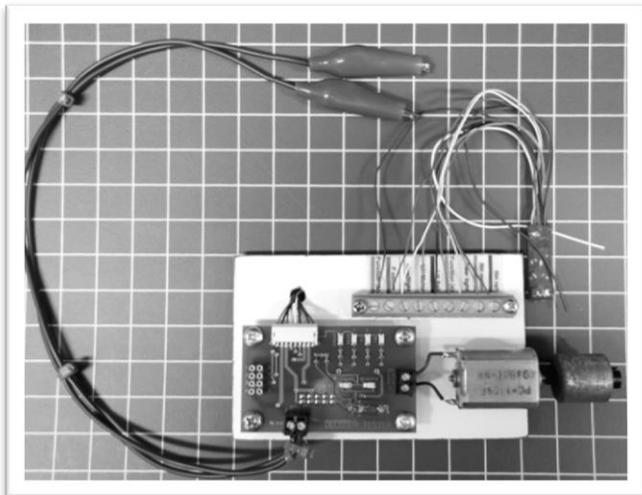
The NCE tester performs all of the important functions and although it does not include a motor, it includes a bulb to provide a load for the motor output so you can read back CV changes. It tests four light functions, including the most commonly used ones. It lacked a motor, which I

thought would be a nice feature, and a speaker. The NCE DTK includes a nine pin plug and an eight pin plug, but there is no place to connect the individual wires found on a universal style decoder. The package also includes two wire harnesses. One has a single nine pin plug on one end and the wires are to be connected to a decoder with test leads. The second one has nine pin plugs on both ends. The board includes a couple of small terminal blocks for track power and an optional motor connection. I thought about it for a while and decided I would mount the tester on a small piece of Masonite along with an inexpensive motor I had purchased on eBay a while back and a terminal block for universal decoders.



I dug through my scrap box and found a small piece of Masonite to use as a mounting base for the tester, motor and terminal block. I purchased an 11 pin terminal block to mount on the board, but everything else was scrounged from what I had on hand. This included a small motor and a test lead with alligator clips on both ends. The test lead was cut in half and connected to the input of the tester. I simply clip the leads to my test/programming track to provide power and control of the tester. I laid out the components to determine the final size of the mounting board and the holes needed.

The construction of the terminal block, which is made to be mounted on a PC board, required a slot in the mounting board so the wires to the tester could be connected to the pins on the bottom of the terminal block. I drilled a series of overlapping holes and cleaned up the result with an X-Acto knife and a file. I sacrificed the wire connections on each end so that I could use the resulting holes for screws to attach the terminal block to the board. I decided to use the single ended nine pin connector harness to provide a connection from the nine pin plug to the terminal block. I made four short spacers to use to attach the tester to the board, as there are leads protruding from the back of the board. You could use washers to achieve the same result. I drilled another hole to feed the wires from the connector to the bottom of the board where they attach to the terminal block. I soldered the wires to the terminal block and used hot glue to secure them to the board. I also installed four silicone pads to the bottom to provide clearance for the wires.



The motor was fastened to the top of the board with some of the double sided foam tape that I use to install decoders. Sometime during this process I realized that it might be difficult to tell if the motor was turning by just looking at the shaft. I dug through my motor parts box and found a dead Atlas motor with flywheels and the shaft diameter was an exact fit for my motor. This makes it easy to see when the motor starts to turn. I made copies of the wire color and identification template that was included

with the RMC article and attached them to the front and back of the mounting board, to simplify wire connection. You could also color code the top of the terminal block to match the wire colors.

The result is a nice compact decoder tester for about half of what I was prepared to spend. Mine does not include a speaker, but I figure it will be easy to attach a speaker when testing a sound decoder and it does include a terminal block for connecting universal decoders and a motor. My total expenditure was about \$23.00 not counting the bits and pieces I had on hand. All in all, I was pleased with the result.