By Larry Puckett

# New sound decoder fits tight installations


General Electric 44-ton switcher no. 1952 prepares to couple to cars at the freight depot on Larry Puckett's Piedmont Southern layout. This month, Larry dives into the installation of the newly released Zimo MX660 sound decoder.

**Recently, I got an email** from Bryan Vianco at Streamlined Backshop (www.sbs4dcc.com) letting me know about a new sound decoder, the Zimo MX660.

Bryan was excited about this new decoder because he had provided the specifications to Zimo with a circuit layout designed for installations in N scale diesels. The big difference from a lot of other decoders is this one has all the components on one side and lots of solder pads for making wiring connections around the edges.

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There are so many neat features on this decoder that I can't begin to list them all, so for a complete roundup, head to the Streamlined Backshop website and look for the Zimo MX660 under Tips, Tutorials, and Tricks.

At only 2.5 x 9.6 x 42.3mm (1), this decoder will fit into a lot of tight spots. It can be used with motors drawing up to .8 amps, has a 1 watt audio amp, and six function outputs. Conveniently, it has a 470µF energy storage capacitor built in, and connections for a larger stay-alive circuit.

**I was interested in** the MX660 because of the potential for fitting it into some small HO scale switchers in addition to the intended N scale applications. I have a Bachmann HO scale General Electric 44-ton switcher that seemed to be a good subject.

There have been several releases of this diesel, and mine came DCC-ready. After removing the shell, I disconnected the wires and removed the old circuit board. This left a plastic platform over the motor where I could install the decoder.

I cut a couple pieces of double-sided foam tape to fit the platform, then seated the decoder on top – a perfect fit. It helps to have a copy of the circuit diagram (2) when orienting the decoder so the correct end faces forward.

Next, I soldered the power pickup wires from the trucks to the left and right solder pads at each end of the decoder. I tested the wires with a volt-ohm meter to make sure I didn't reverse these connections. Finally, I soldered the motor leads to the respective pads on the decoder. Note that there are no polarity indications on either the decoder or the motor, so if it runs backward, you'll have to swap the wires.

**For the speakers,** I used 8 x 12mm sugar cube speakers from Streamlined Backshop, which required soldering wires to the metal contacts on the speaker.

A little cyanoacrylate adhesive (CA) applied to the enclosure secures the speaker, and I always apply an additional line of cement around the outside as well to make sure I get an airtight seal. I used a pair of these speakers because they are so small and also as a test to see how well they would perform together.

I placed the speakers over the trucks. Because the truck worm gear extends a little above the top of the gear tower, I cemented a 15 x 15mm square of styrene to the bottom of the speaker enclosure and eased it into place.

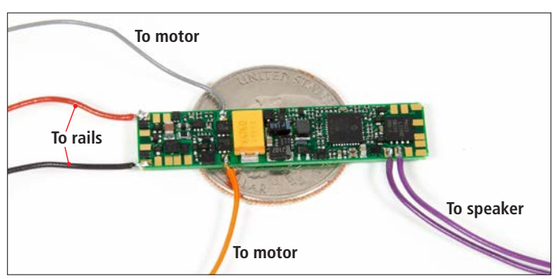
The four screws on top of the truck tower served as spacers keeping the gear from rubbing against the styrene. I wired the speakers in series. Having no way to check speaker polarity, I just took a guess to wire them in phase. Given the results, I must have guessed right.

With the speakers in place, I soldered the wires to their solder pads on the decoder. For more on selecting and wiring speakers, see my May 2016 DCC Corner column.

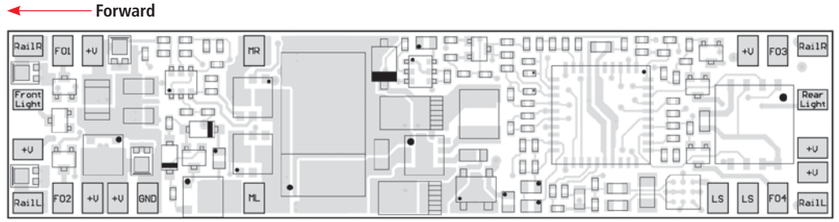
**Since the decoder** is designed to work with light-emitting diodes (LEDs), I dug out a pair of Richmond Controls (www.richmondcontrols.com) 3mm sunny-white LEDs, clipped the leads short, attached a couple wires, and installed a length of heat-shrink tubing, leaving only the tops of the bulbs exposed.

Keeping the polarity of the LEDs in mind, I soldered the wires to the front and rear headlight pads (3). Remember, the flat spot cast into the side of the LED lens indicates the negative contact.

Having all those extra positive voltage solder pads really makes connecting the LEDs easier, which is exactly why Bryan specified them. With that job completed, I inserted the LEDs into their mounting holes and moved on to the stay-alive capacitor pack.




(1) **Compact package.** The Zimo MX660 sound decoder is small at 2.5 x 9.6 x 42.3mm, so it will fit in a lot of tight settings, yet it's rated to supply .8 amps for the motor.




(2) **Circuit board layout.** Bryan Vianco, owner of Streamlined Backshop, designed the MX660 decoder layout with lots of solder pads, including a positive voltage pad adjacent to each function connection, as shown in this diagram.

**Having the decoder** and speakers installed over the motor and trucks left me space in the cab for a stay-alive. I consider these essential in small locomotives. I selected a TCS KA4 Keep Alive. At 10 x 13 x 13mm, it fit in the cab roof with room to spare on the sides.

I soldered the black/white wire to the GND pad and the blue wire to the adjacent V+ pad, and used double-sided tape to attach the KA4 to the roof of the cab. To make it easier to program the decoder and remove the shell for maintenance, I spliced a 2-pin TCS connector (no. 1301 or no. 1473) into the KA4 wires, and held off connecting it while programming.

**Zimo sound decoders** use loadable sound projects, requiring a special interface similar to the way LokSound and Digitrax projects are installed. The difference is that Zimo offers its own free projects along with some developed by private individuals, which will cost you extra.

I found an acceptable sound project, developed by Heinz Dappen, based on Denver & Rio Grande Western no. 50, a Davenport switcher with the same Caterpillar D17000 diesel engine that was standard equipment on GE 44-ton switchers. The project has a multi-chime horn that was closer to the Nathan M3 on my model.

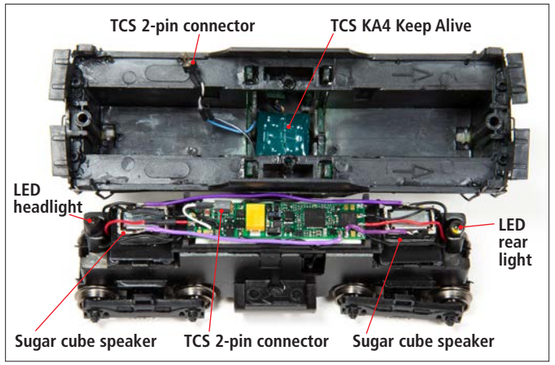
Make sure to visit the Zimo webpage (www.zimo.at/web2010/sound/tableindex_EN.htm) to select a sound project in advance and ask the Zimo dealer to install it for you.

With the decoder installed, I took the model to a Sprog 3 programming track and used DecoderPro to program the various Configuration Variables (CVs). DecoderPro is part of the Java Model Railroad Interface (JMRI) software, available free at jmri.sourceforge.net. There are a lot of options when it comes to programming Zimo decoders (4), but I really didn't need many of them since this was a custom sound project with most CVs preset.

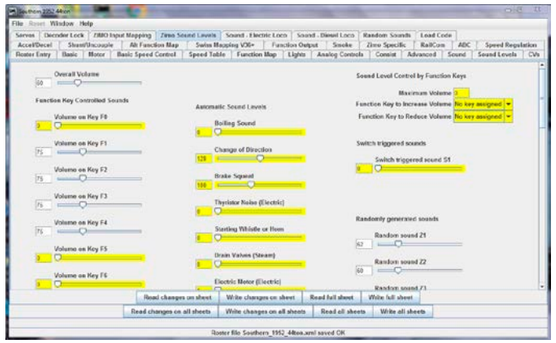
I changed the address and other basic options, then moved on to the Zimo sound levels. I made some adjustments to the sound levels for the bell and horn sounds on Functions 1 through 4, and the diesel engine startup and idle on F8. After exploring the decoder manual, I found that CV376 can be used to adjust the volume of the diesel engine drive sound.

After running the locomotive, I remapped the horn sounds. As provided, the sound project has the crossing horn sequence on F2, the long horn on F3, and the short horn on F4. I wanted a playable horn on F2 and the crossing sequence on F3.

You can't directly remap the sounds using the DecoderPro function mapping pane; instead, a "300" procedure is required. This is described in the Zimo decoder manual, and requires entering a special programming mode to assign the sounds to the desired function buttons. I followed the steps outlined and it went like clockwork.




(3) **Neat installation.** Installing the Zimo MX660 in the Bachmann GE 44-tonner was much easier with all those well-spaced solder pads distributed around the edge of the circuit board.



(4) **Setting sound levels.** DecoderPro makes programming the MX660 fairly straightforward. Although there are numerous panes available, Larry got by with just the BASIC and ZIMO SOUND LEVELS panes.

**The completed installation** adds some interesting sounds to a small locomotive that has been relegated to a shelf for far too long. It will now draw some high-visibility yard assignments on the Piedmont Southern, where its unique diesel rumblings will be appreciated. To hear the completed model and see it at work, visit my website at www.dccguy.com. MR