Athearn EM40 “Critter” NEXT18 Sound Installation

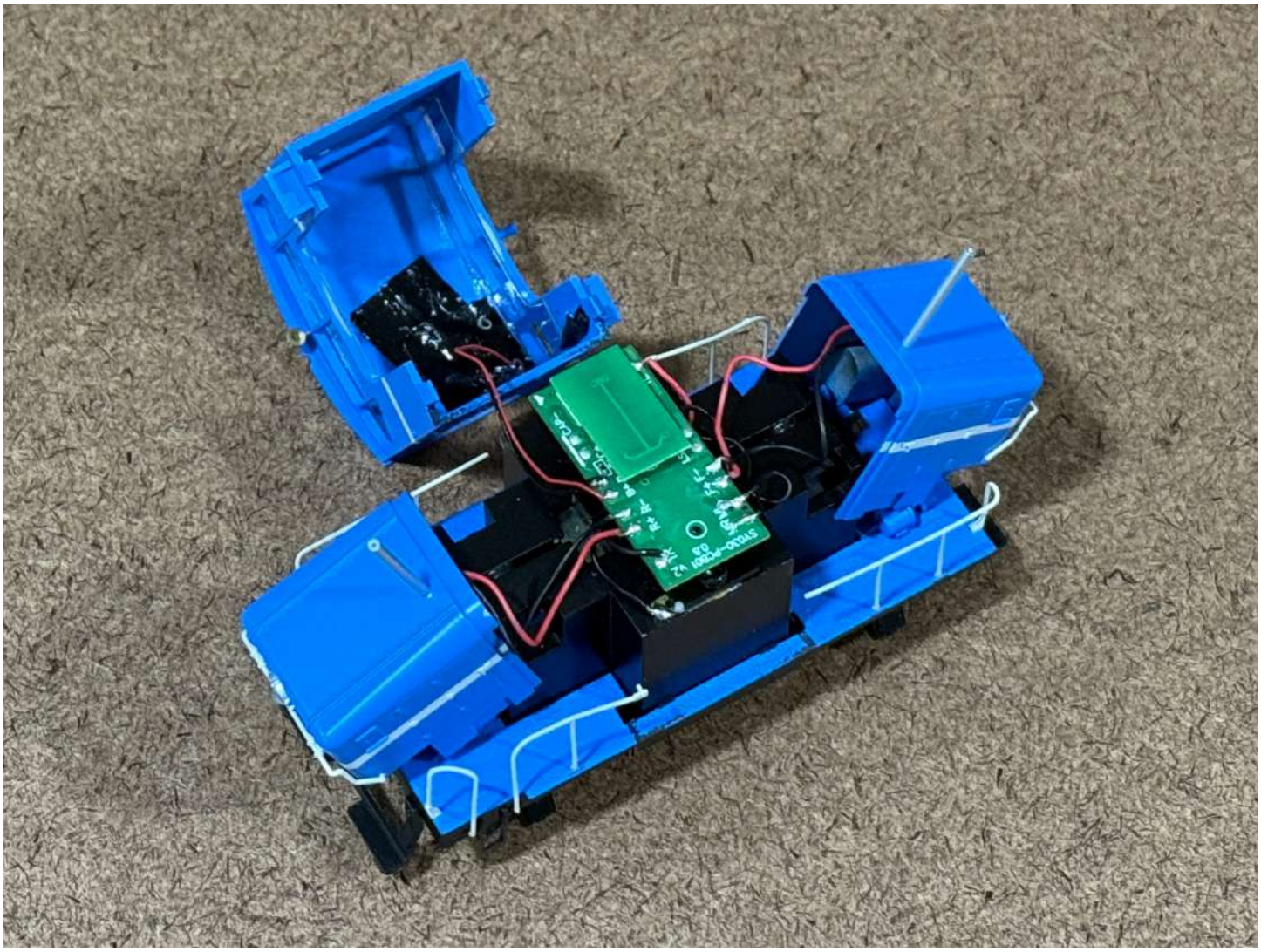
www.ScaleSoundSystems.com

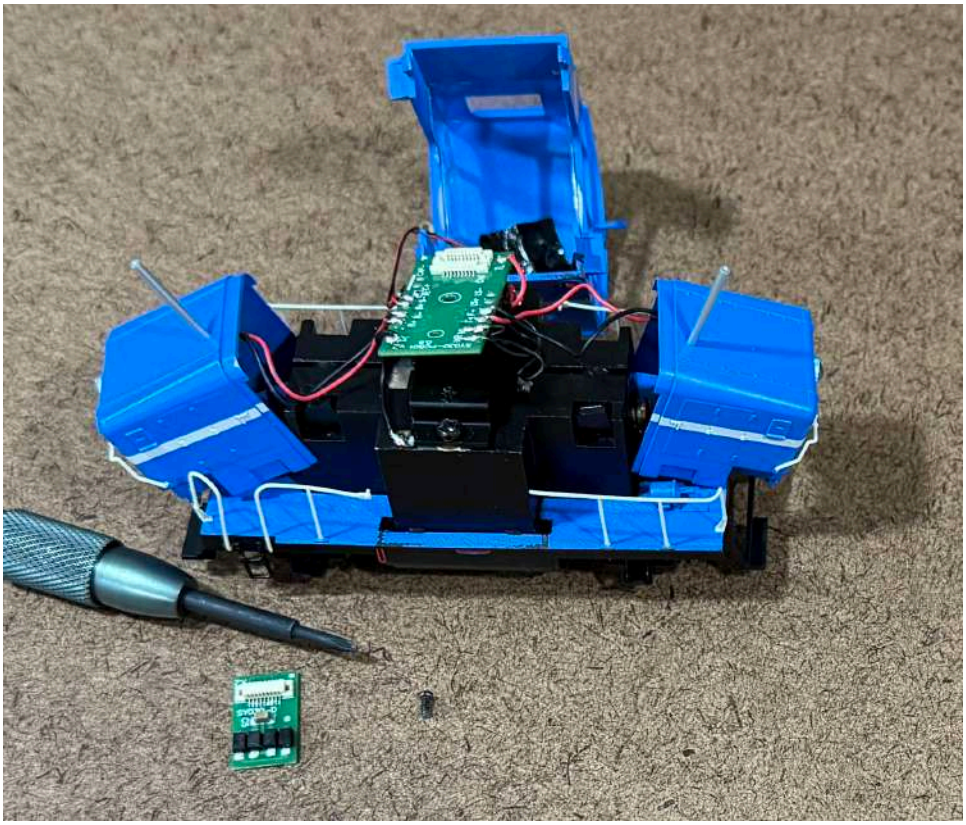
This guide covers the installation of a sound decoder, speaker and stay-alive in the 2025+ run of Athearn EMD EM40 Critters that come factory-equipped with the NEXT18 board.

Earlier Roundhouse-branded runs of these models had an 8-pin board that requires removing the stock board and hard-wiring an ESU 58823 bare-wire Micro decoder. I do not have a guide for these versions but the finished photo on the product page tells the story. https://www.scalesoundsystems.com/product-page/athearn-roundhouse-em40

The 2025+ run with NEXT18 motherboard still requires extra effort to install sound. Despite the simplicity of the NEXT18 motherboard and the convenience of solder pads for a speaker and stay-alive (yea!), the height of the motherboard assembly leaves no room for a speaker or stay-alive once a NEXT18 decoder is snapped in place (boo!). It still isn’t too crazy, so let’s get started!

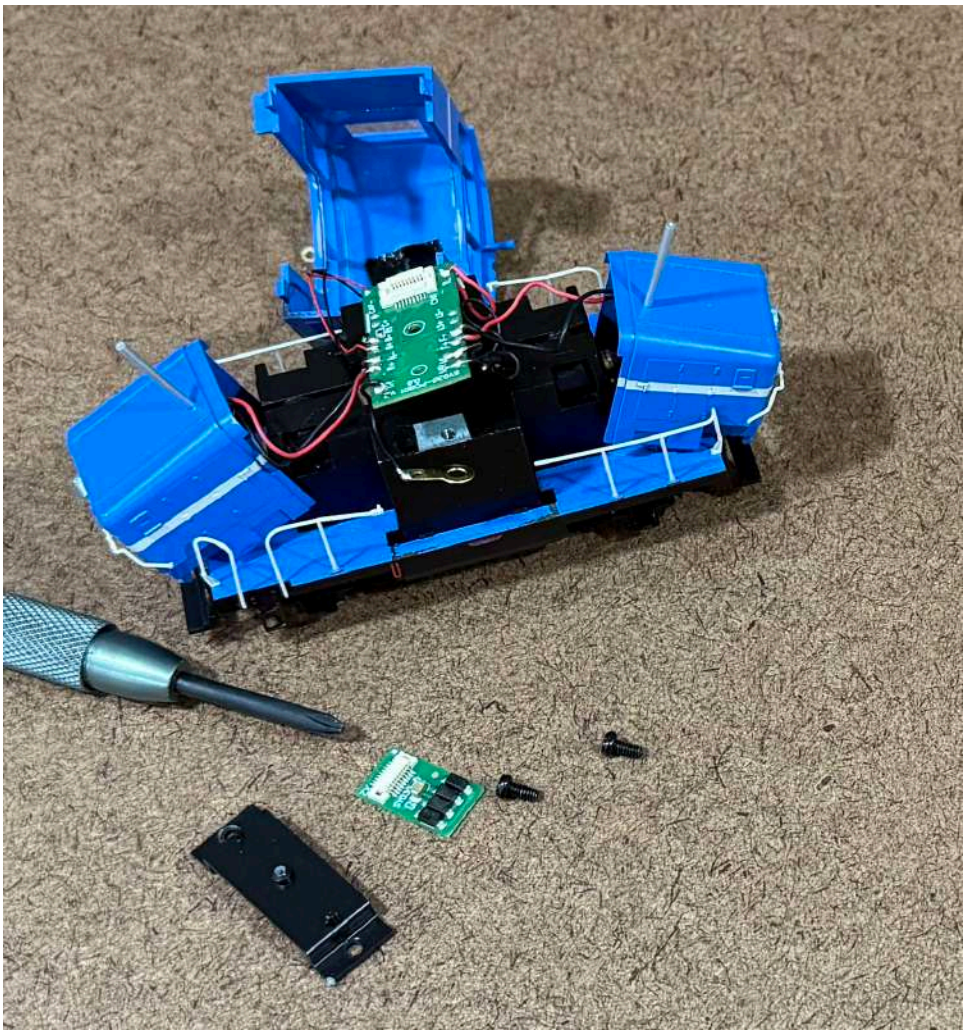
We start with a look at the stock locomotive as it comes out of the box (obviously after you’ve released the cab and hoods!). It has a NEXT18 analog plug installed. Once you’re satisfied with its operation and break-in the mechanism a bit on DC, remove this plug.

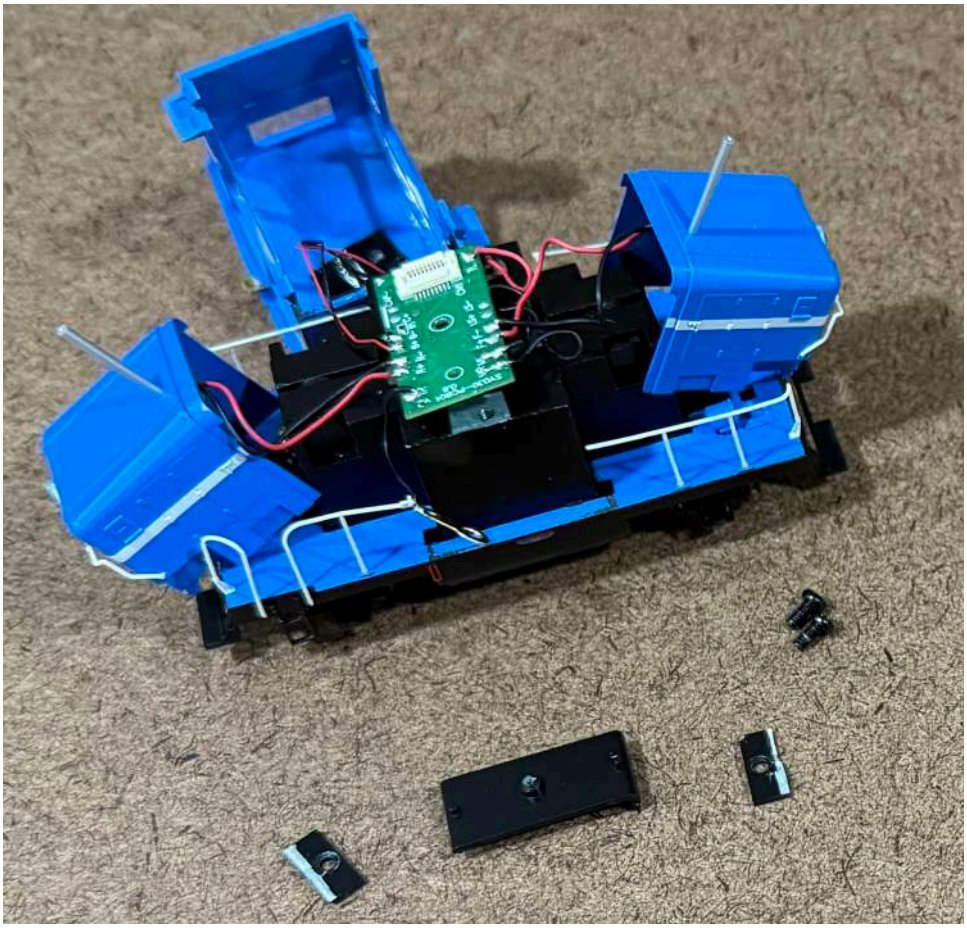




After removing the DC plug, remove the small screw holding the motherboard to the plastic stand-off.

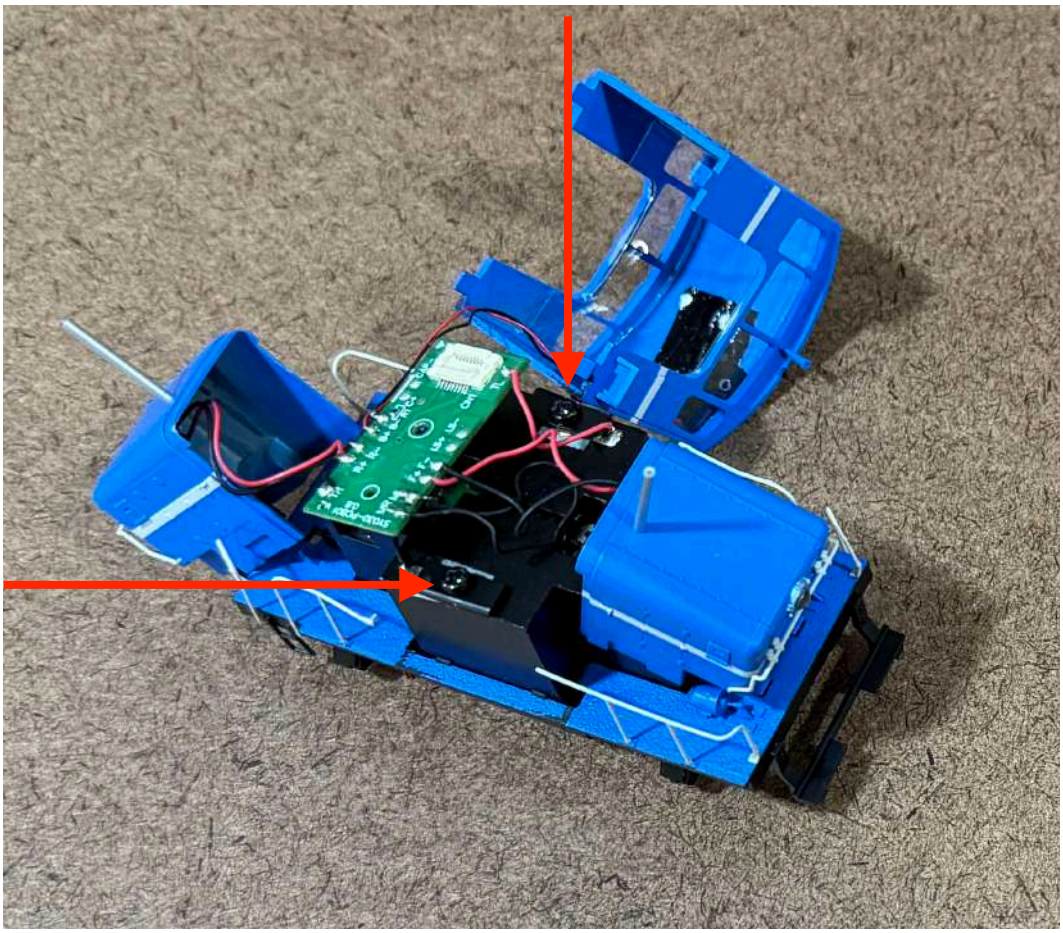
Gently move the board aside and remove the two screws holding both the plastic stand-off and each wheel/ track pickup wire. Pull the plastic stand-off out from under the motherboard.

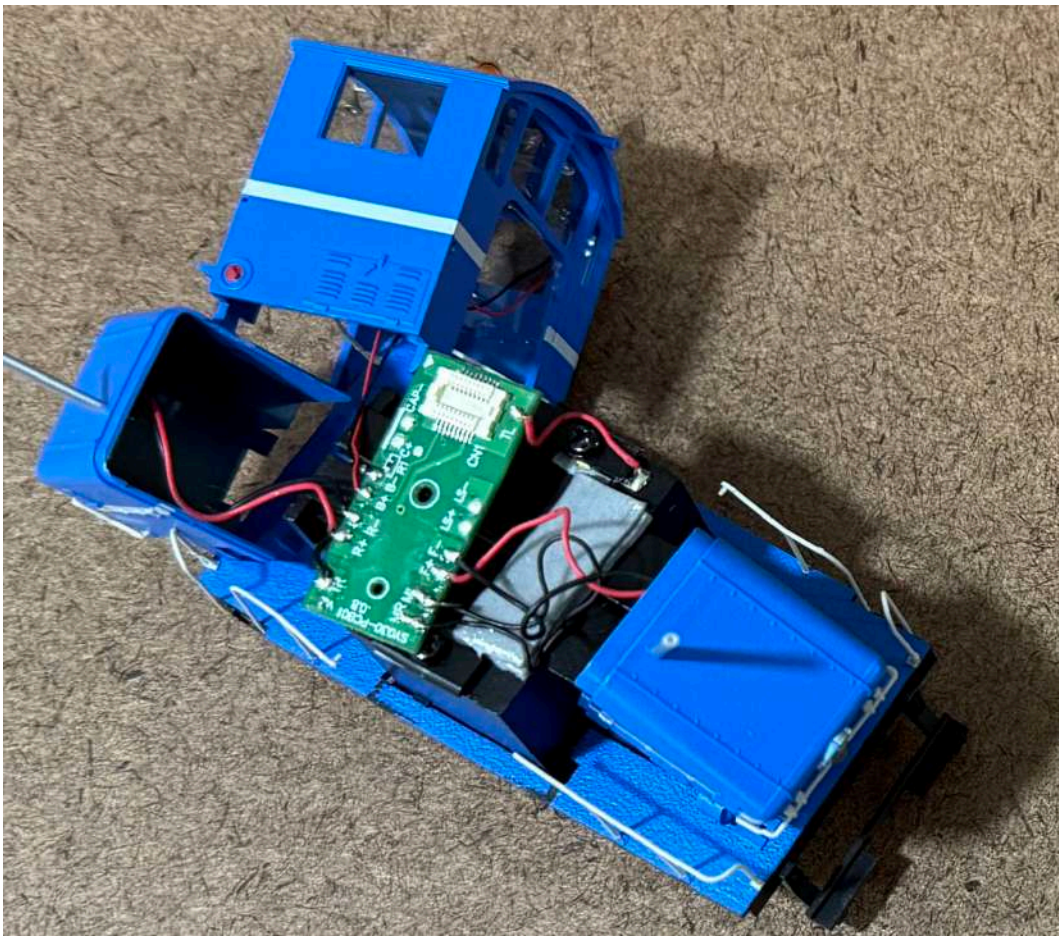




Trim the “ears” off the stand-off. We need to use them as spacers to reinstall the screws for the track pick-up wires.

Reinstall the screws with the nipped-off “ears”, being sure the track pick-up ring-connectors are on the bottom, being screwed firmly to the chassis as they were.

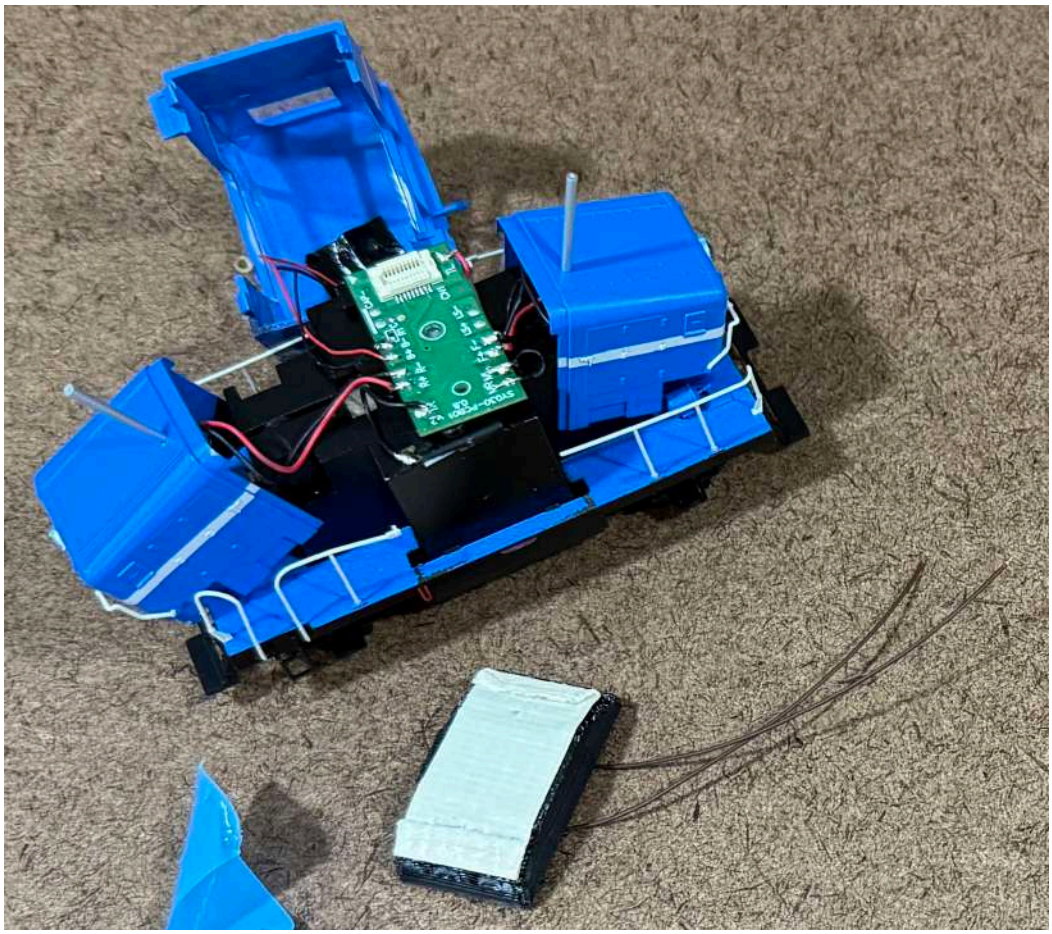


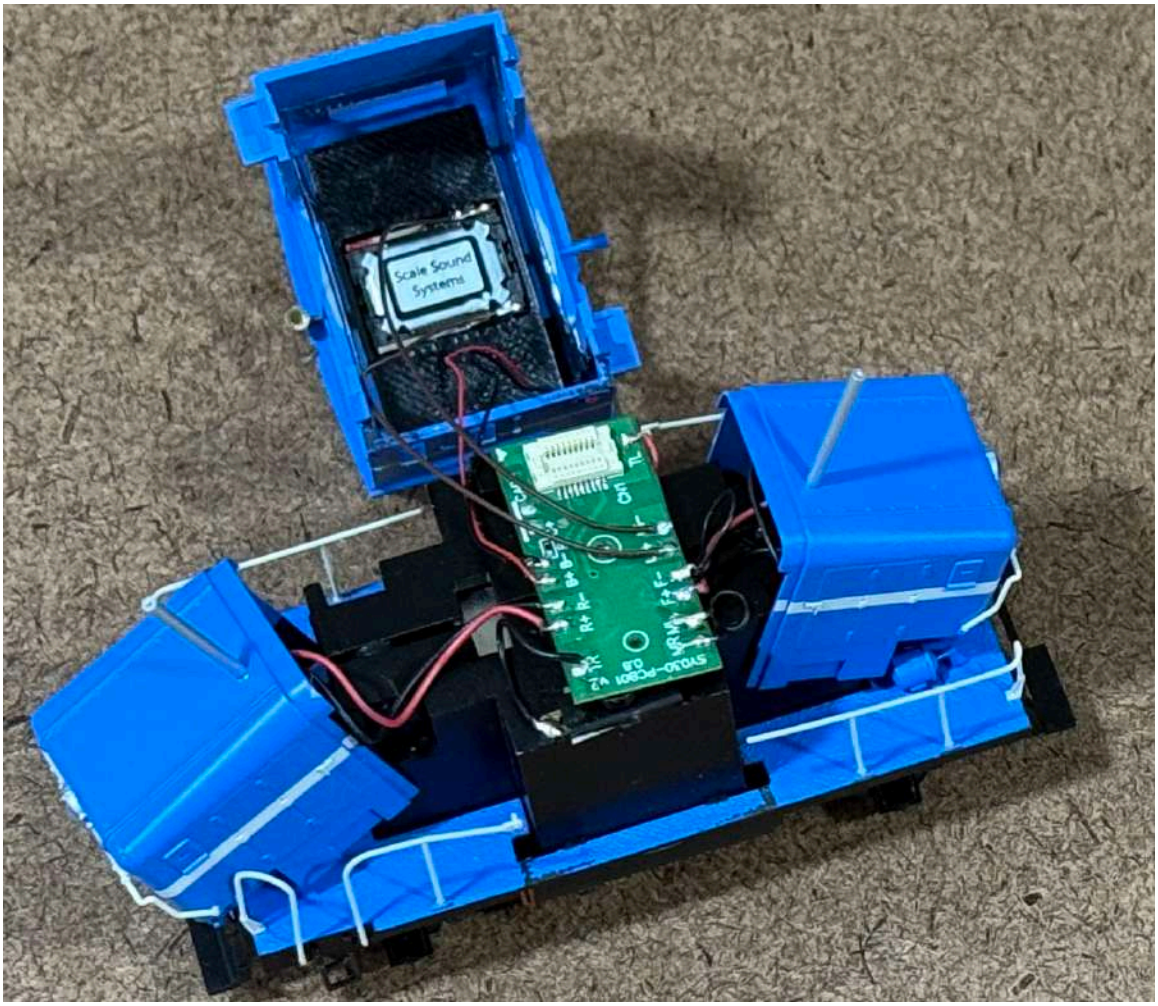


I used two layers of 3M outdoor mounting-tape to secure the motherboard. The board needs to be secured all the way to one cab-end, not centered as it was. Do not let the mounting-tape get too thick here. We have very little headroom to work with. It just needs to be thick enough to fill the gap between the chassis and board that is propped on the screw-heads.

Solder 3” long wires to the Scale Sound Systems AHRH-EM40 speaker contacts and tin the bare ends.

Use thin mounting-tape (the blue-filmed variety I show in the Installation & Use Guide) to secure the speaker into the cab-roof.





With the speaker in place, solder the speaker wires to the motherboard's solder pads.

A stay-alive turns these little critters into reliable, smooth running locomotives. We have *very* little room left, but thankfully the Nix Trainz Power Bridge III fits perfectly!

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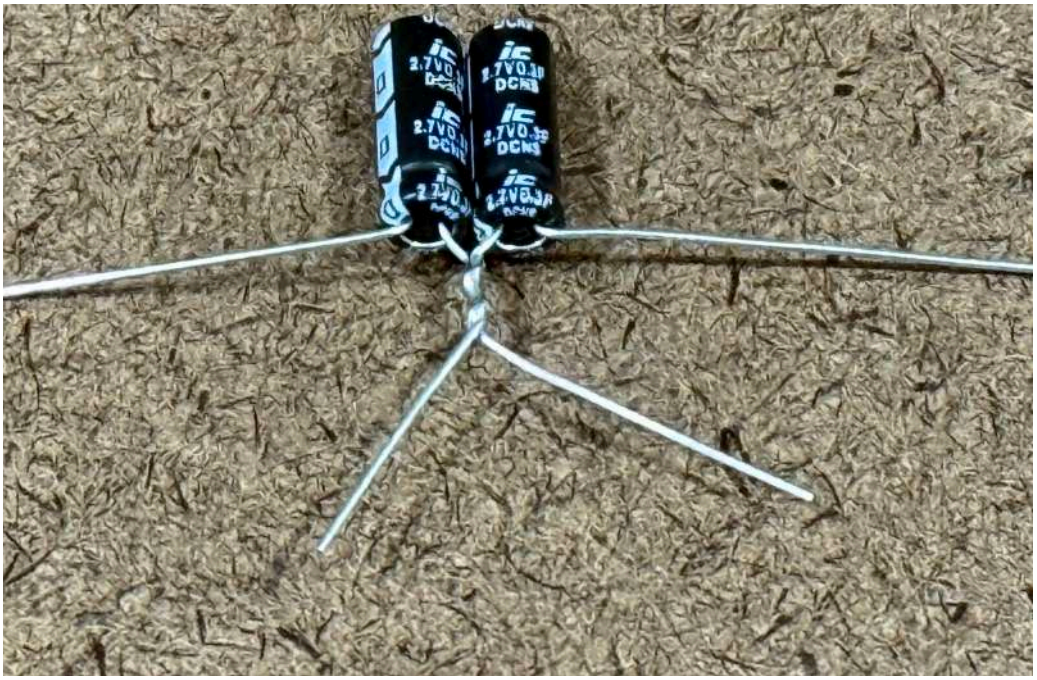
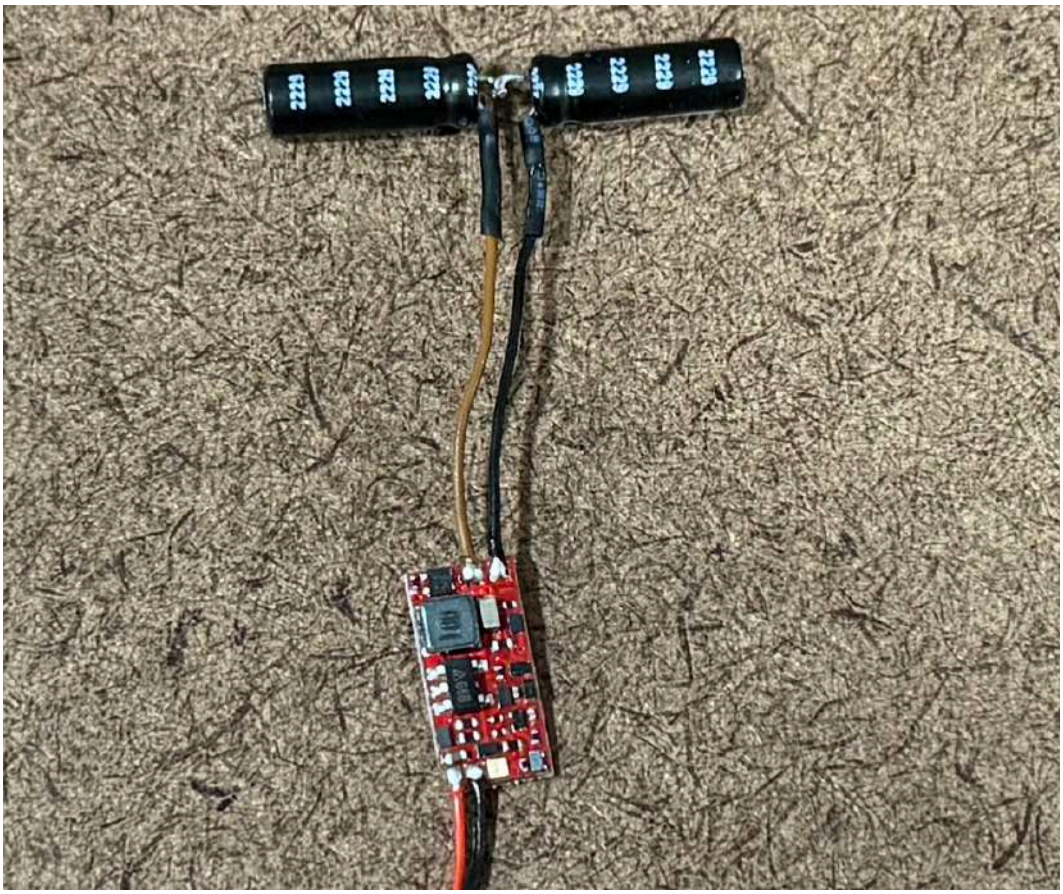
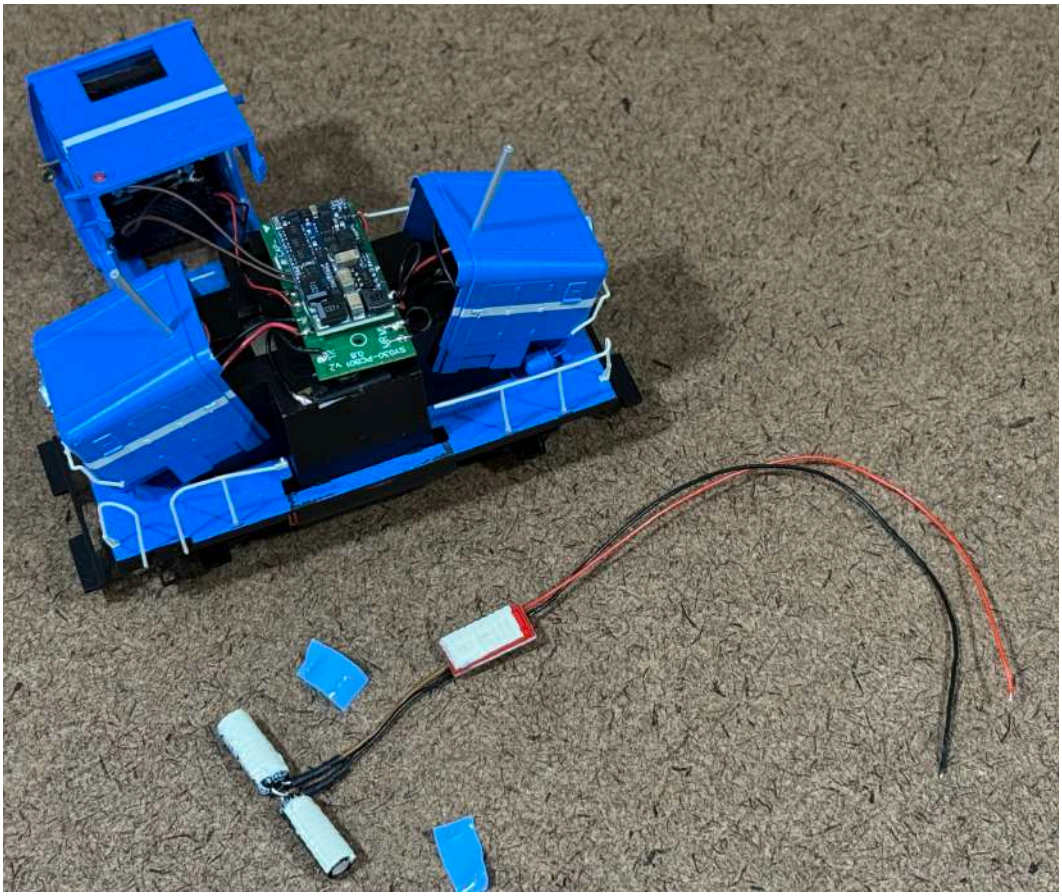


The voltage requires that we use both caps wired in series. Since we have so little room, we need to orient the caps end to end. Place the caps beside one another with a positive lead and negative lead beside each other. Tightly twist these leads together and flow a small amount of solder into the twisted leads.

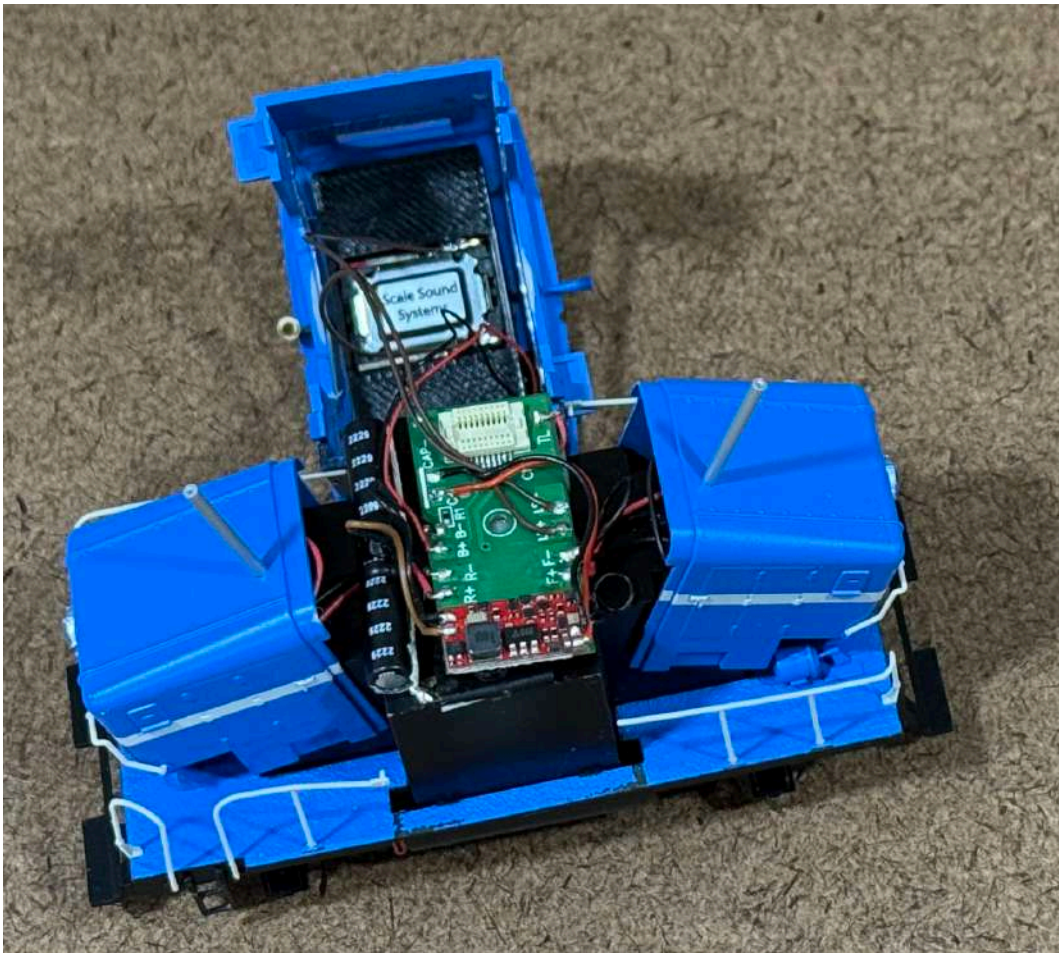
Trim the excess twisted leads, then straiten the caps out with the remaining positive/negative leads pointing down. The two caps and two leads should form a T-shape. Trim the leads short, trim the black and brown control board wires to 1” in length, apply heat-shrink over the wires and solder the brown wire to the positive capacitor lead and the black wire to the negative capacitor lead. Shrink the heat-shrink over the joints and make sure the trimmed twisted leads are not touching either of the wired-leads.

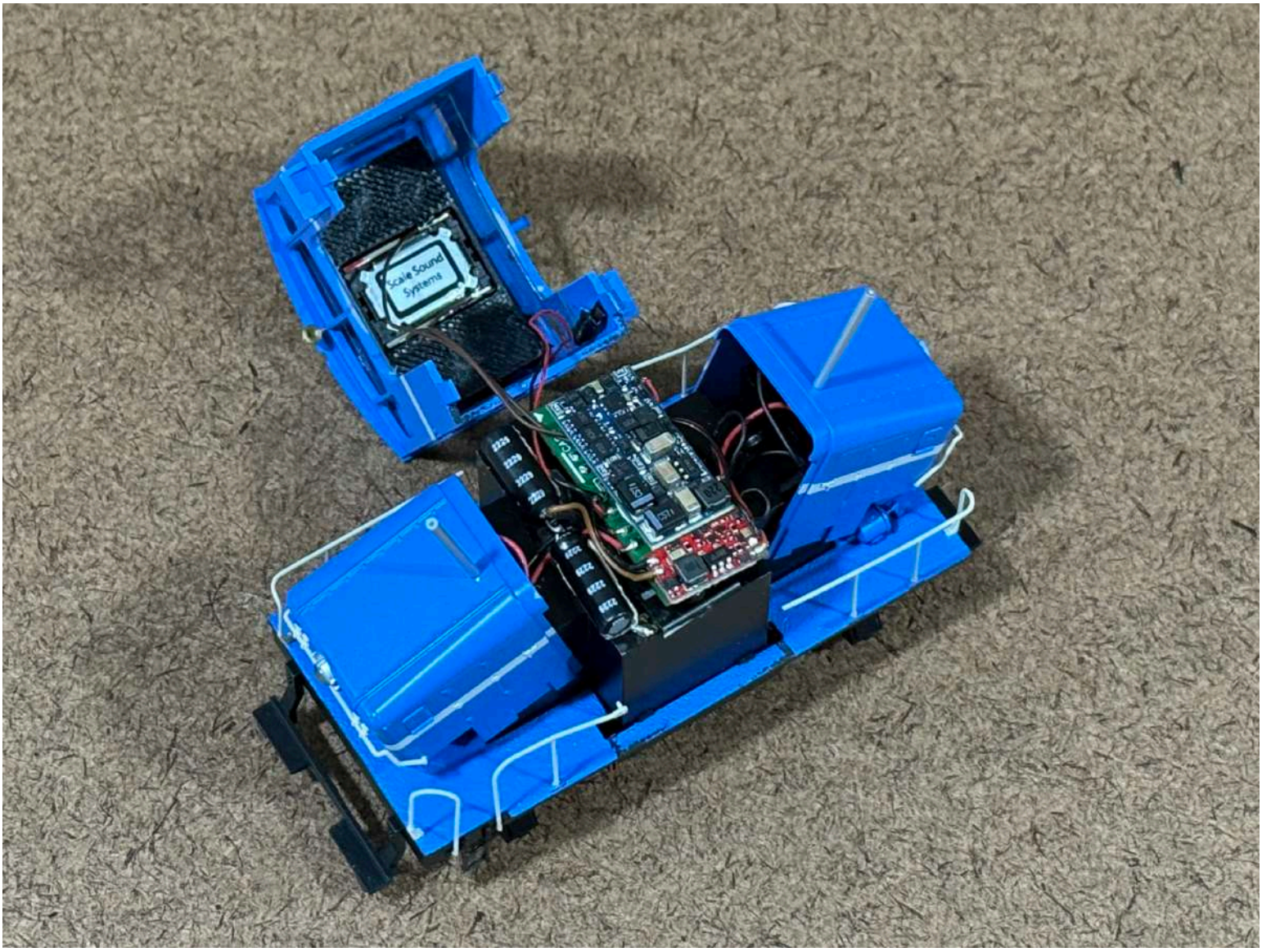




I applied strips of thin mounting-tape to the bottom of the control board and both caps.

Stick the control board at the very end of the motherboard. It will sit at the “foot” of the NEXT18 decoder. Stick the caps along side the motherboard. Trim the black and red control board wires short and solder to the CAP solder pads on the motherboard; red wire to positive, black wire to negative.





Snap the decoder onto the motherboard, tidy up with wires and snap the hoods and cab back onto the sill/ frame.

There will only be a sliver of space between the speaker and decoder. Make sure the speaker contacts do not touch the decoder. If they do, flip the speaker so the tabs are on the other end.

If your cab does not fit back down you may have used too thick of mounting tapes and/or you need to gently tweak positioning of the components. With careful work the entire package fits perfectly.

You may wish to frost, tint or black-out the windows to hide the electronics.

With this installation, these critters run super smooth, reliable and sound great doing so.

If your EM40 has a rotary beacon on the roof, it is wired to AUX1/FX3. If you're using a LokSound 58828 decoder with the S0584 RDC file, program CV31 = 16, CV32 = 0, CV275 = 7 and CV279 = 128. This makes AUX1 a rotary beacon and assigns it to F5 on your throttle.