

# HOW TO MODEL LOCOMOTIVES



Not all shop facilities need to be huge, sprawling affairs. This Union Pacific open air running repair shop served the East Los Angeles yard in 1985. Retired *Model Railroader* senior editor Jim Hediger takes you through the steps of preparing a locomotive for service in his story starting on page 22. Photo by Jim Hediger

## 7 Motivation for motive power

Introduction/by Eric White

### DIESEL ERA

## 8 Modeling a compact diesel servicing terminal

Add fueling and sanding operations without taking up a lot of space/by Thomas Klimoski

## 14 Sound for legacy locomotives – F units

A little soldering goes a long way/by Larry Puckett

## 16 How to detail, paint, and decal a locomotive

Give a road switcher a new look/by Cody Grivno

## 22 How diesel facilities work

A lot of work goes on behind the scenes between road trips/by Jim Hediger

## 26 Speed matching for DCC consists

Learn how to make your locomotives play well with others/by Larry Puckett

## 28 Weathering N scale locomotives

Paints, pastels, and washes enhance this six-axle road unit/by Cody Grivno

## 30 Detail a remote-control locomotive

Modernize yard and road switchers in one evening/by Cody Grivno

## 32 Below decks

A hidden world in the diesel shop/by Jim Hediger

## 33 How to weather without an airbrush

A modern unit gets some road grime/by Cody Grivno

## 36 Kitbash a modern sand tower

Build this yard fixture like the prototype did – start with a hopper car/by Kazuo Terasawa

## 42 Getting the locomotive you want

Modify a Stewart Alco RS-3 to create Jersey Central No. 1554/by Alan Mende



On page 16, see how Cody Grivno stripped, detailed, repainted, and decaled a locomotive to decorate it for a project railroad. Trains.com photo



Turn to page 14 and follow along as Larry Puckett demonstrates how to install sound decoders into a pair of older HO scale Electro-Motive Division F units. Photo by Larry Puckett



Start your stopwatches! On page 70, Tony Koester shows how you can weather a steam locomotive with PanPastel products in just 7 minutes. Photo by Tony Koester

#### 46 Install DCC sound in ready-to-run locomotives

Commercial sound decoders bring realistic audio effects to a pair of HO diesels/by Pelle Søbørg

#### STEAM ERA

#### 49 Kitbashing an HO scale 2-8-2 steam engine

Swapping out a drive axle for a trailing truck is just the start of this conversion/by Robert A. Boyd

#### 52 Scratchbuild a water tank from stripwood

A cardboard mailing tube is the core for this rustic structure/by Steven Otte

#### 55 Coaling trestle refuels steam locomotives

Railroads used trestles and gravity to feed their hungry engines/by Jim Hediger

#### 56 Turning Big Boys in 2 x 5 feet

This HO scale locomotive terminal lifts to the ceiling to clear a doorway/by Pelle K. Søbørg

#### 62 Upgrade a steam locomotive

Modeling techniques to make a good engine even better/by Gil Bennett

#### 66 An engine-terminal layout

A multi-deck staging yard feeds this busy urban facility/by Rick De Candido

#### 70 Weathering a steam locomotive in 7 minutes

PanPastel colors and applicators make it easy to simulate the grime of railroading/by Tony Koester

#### 74 New sound for an old brass steamer

Modern decoders and speakers add realism/by Larry Puckett

#### 76 Re-letter and weather a steam locomotive

Capture the appearance of an engine in its final years/by Cody Grivno

#### 80 Adding sound to an N scale steam locomotive

Limited space for components can present challenges/by Larry Puckett

**ON THE COVER:** Pelle Søbørg shares how he installed sound decoders in two HO scale modern diesels. See page 46. Photo by Pelle Søbørg



# How to install DCC sound in ready-to-run locomotives



**This image of Pelle Søbørg's idling HO scale Atlas General Electric C40-8 (left) and Overland Models GE C45ACCTE locomotives is dramatic. However, no photo can convey the thrill of hearing these sound-enhanced diesels rumble and roar over his Daneville & Donner River layout.**

Commercial sound decoders bring realistic audio effects to a pair of HO scale diesels

By **Pelle K. Søbørg** • Photos by the author

**B**efore I acquired my first sound-equipped locomotive, I never really thought that having sound in my motive power would be important to me. Since then, I've discovered that I'm no longer content with watching a locomotive consist silently traverse my railroad. Now I know that authentic effects generated by a contemporary locomotive sound system bring an extra dimension to model railroading.

I'm amazed how the sound of an idling diesel, the echoing roar from an

approaching consist, or a horn blowing for a grade crossing adds to the action on my HO scale Daneville & Donner River layout. [Pelle's former layout appeared in *Model Railroader's* November 2006 issue. — Ed.] From operating just one sound-equipped locomotive, it didn't take long to see how sound helps create an authentic layout setting. Consequently, I decided to add sound to all my existing locomotives.

Since tinkering with electronics doesn't come naturally to me, I decided

to refine my installation skills using two different HO scale diesel locomotives. In the following instructions, you'll see the techniques I used to install ESU Lok-Sound Digital Command Control (DCC) sound decoders and speakers in both a ready-to-run, plastic Atlas Model Railroad Co. General Electric (GE) C40-8 locomotive and a brass Overland Models GE C45ACCTE (GEVO) contemporary diesel. [MIR](#)



## 1. Custom-built speaker cabinet

**Before installation began**, I studied the components of the ESU sound system. Each includes a decoder, speaker, and a user manual with an installation guide.

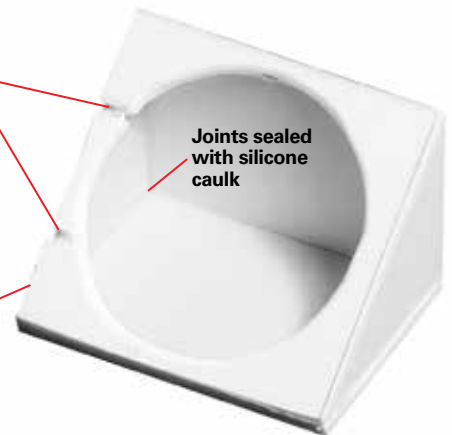
At first I planned to install the decoders using a locomotive with a factory-installed sound system as my guide. That locomotive came with the speaker mounted inside the fuel tank. Unfortunately, the fuel tank on my Atlas model is solid metal, and the tank on the Overland model includes a large weight. Since the fuel tanks couldn't be modified easily without potentially damaging the models, I devised an alternative solution.

I decided to position the .91"-diameter speaker diagonally inside the locomotive shell. The Overland model had plenty of room to accommodate the system components. However, I had to trim the rear weight in the Atlas unit to make room for the speaker and the triangular speaker enclosure I made from .040" sheet styrene. In an effort to produce the best sound quality possible, I took extra care to build two precise-fitting enclosures. Additionally, I sealed the joints with silicone caulk to create an air-tight chamber.

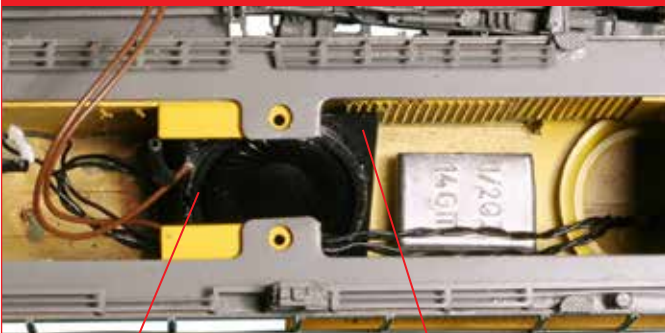
Cut slots in styrene to channel speaker wires

Joints sealed with silicone caulk

.040" styrene



## 2. Brass model installation



Speaker enclosure installed in the brass locomotive's shell

Painting the enclosure black makes it less noticeable when viewed through grills

**I started with** the installation process on my brass Overland C45ACCTE because it seemed to be the less challenging of the two locomotives. After constructing the speaker enclosure, I painted it black to help disguise

the white styrene from view through the see-through louvers and grills. Next, I used silicone caulk to attach the speaker to the enclosure with an air-tight fit. I also used the silicone caulk to attach the enclosure to the shell.

My locomotive was already equipped with a non-sound DCC decoder, so I cut the wires and connected them to the new ESU decoder. While the National Model Railroad Association (NMRA) has established a recommended practice (RP) for wire color codes, not all manufacturers follow it. Be sure to verify all connections before installing a decoder.

As defined by the NMRA RP-9.1.1, black and red wires connect to the electrical current pickup. Orange and gray connect to the motor. Yellow routes to the headlights, while white routes to the rear light. Green and violet are for other functions, such as ditch lights. Blue connects to the common (positive) wire. I tested the locomotive before re-assembling the shell to the frame.



Turning  
**BIG BOYS**  
in 2 x 5 feet





This HO scale locomotive terminal lifts to the ceiling to clear a doorway

By **Pelle K. Søbørg** • Photos by the author



**F**lemming Ørneholm's HO scale Eaglecreek & Northern, which was featured in the February 2012 *Model Railroader*, is a testament to his ingenious use of space. In less than 7 x 12 feet, Flemming's HO scale layout captures the sprawling vistas of the west along the Union Pacific. With massive UP 4-8-4 Big Boys regularly hauling freight along the main, the layout feels larger than it is. Over the past year, Flemming made the layout even better with an engine terminal that includes a roundhouse and a Digital Command Control- (DCC) equipped HO scale 130-foot turntable.

The inspiration for the extension to the layout came from an engine terminal module that Flemming saw during the National Model Railroad Association British Region convention in 2010. Thinking that he'd run out of layout space, Flemming originally planned his own engine terminal model as a stand-alone diorama. However, he always wanted an easier way to turn locomotives, so he figured out a way to incorporate the scene into the layout.

### Space-saving design

Most of the Eaglecreek & Northern is built in a 6'-8" x 12'-0" room. The main line passes through a hole in the wall to a staging yard built in an adjoining bedroom. Flemming built this scenedicked yard on top of a 1'-10" x 10'-0" cabinet. His new engine terminal scene connects to the end of the yard.

As you can see in the overhead photo on page 49, the new layout extension consists of three parts: the engine terminal diorama, a narrow shelf with two 10-foot long staging tracks, and a city corner section that connects the staging tracks to the main line. There's also a removable foreground section described on page 51 that's used only for adding depth to layout photos.

**A Big Boy 4-8-4 gets turned on the 130-foot turntable and Union Pacific diesels stand ready in the roundhouse on Flemming Ørneholm's Eaglecreek & Northern. The 2 x 5-foot engine terminal scene is part of a new extension to the layout.**