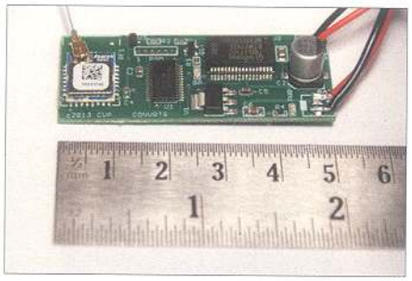

# Tiny receiver

When it comes to battery-powered R/C installations, one of the biggest problems (aside from battery size) is the size of the control electronics themselves. Fortunately, with electronics getting smaller, it's getting easier to fit everything into small spaces, but there are still places where the "usual suspects" in terms of control products are too large to fit.

Enter Airwire's new "Convertr" wireless DCC receiver/booster. This board is unlike Airwire's line of R/C motor-control boards, which consist of a wireless receiver combined with a DCC decoder to control motors and lights. While these fit in the tenders or diesel shells of most locomotives we run, their size still presents a challenge when fitting in smaller spaces.

The Convertr does not have any motor- or light-control functions built in. What Airwire has done is taken a track-side DCC command station and shrunk it to fit onboard a locomotive. You connect a battery to the Convertr and it outputs a DCC-standard bipolar AC wave that can control any NMRA DCC-compliant decoder. The difference between it and a "real" command station is that the Convertr has a specific DCC decoder address in its own right. You couldn't use it to control multiple decoders with different addresses. Being in an on-board installation, you wouldn't need to.

The Convertr is very small (2" x 0.8"), intended to easily fit in the tender of an HO-scale locomotive or boxcar. However, its capacities in terms of working voltages and current make it suitable for large scale as well—at least smaller large-scale locomotives. The board is rated at 2.5 amps continuous output, which is ample for all sorts of small critter-type locomotives; small steamers, like 0-4-0s; streetcars; and other forms of motive power that don't draw high amounts of currents.

I had the ideal candidate for the Convertr sitting on my workbench when Airwire announced they were going to produce it, in the form of a Rio Grande Southern work Goose. This is essentially a glorified pick-up truck on 3'-gauge railroad wheels, so there's not a lot of room for electronics. Most often, people build large wooden crates or other loads for the back of the Goose to hide the electronics. However, this seemed like the ideal situation to see how much of the electronics I could hide underneath.

The board hides quite well, between the frames of the Goose. I hid a power switch in a toolbox and a speaker under the hood, so only the battery needed to be on the bed—a definite improvement over other installations I had seen.

In order to actually control the Goose, I needed to add a DCC decoder. For this, I used a Soundtraxx "Tsunami" decoder with authentic Galloping Goose sound. While the Convertr can handle a 2.5-amp continuous output, the Goose doesn't draw anywhere near that, so I could use a Tsunami rated at only one-amp continuous output. For other locomotives, you'll need to make sure the decoder you choose is up to the current being drawn by the locomotive (while also making sure the locomotive doesn't exceed the rating of the Convertr).

Connecting the decoder to the Convertr was a simple matter of soldering the DCC inputs of the decoder to the DCC outputs of the Convertr. The battery gets wired to the battery input of the Convertr. Note: The battery connection is polarity sensitive, so make sure you get that wired correctly. The DCC output is not. The Convertr and Tsunami boards come with factory-default settings for frequency and DCC address respectively. With the Airwire throttle set accordingly and power turned on, the Goose sprang to life. Then, I could program a new frequency and DCC decoder address if I wanted to. I operate everything on the default frequency, but changed the decoder address to match the locomotive number.

Now it was time for a proper road test. I realized there is one key thing to remember to program. Many DCC decoders (including the Tsunami) can run on analog DC as well as DCC. This feature needs to be turned off so that the decoder will only run on DCC. This is because, when the Convertr is not receiving a valid signal from the transmitter, it sends a "regular" DC signal to the decoder at whatever battery voltage you're using. If the decoder is programmed to run on DC, it will see this voltage and take off down the track at full throttle. So CV 29 must be set to only run on DCC.

With that minor hitch corrected, the rest of the road test went well. Range was good, mostly on par with other Airwire receivers I have. My sample is the version with the 3" whip antenna, which I ran outside the Goose's brass body for better reception. If it loses signal, though, it keeps going at whatever the last throttle setting was. Occasionally the horn would randomly blow as it came back into range.

I found I had no trouble in programming the Tsunami to customize its performance; it was just as if I were using any "regular" DCC command station.

Airwire recommends at least an 11.1V li-ion battery for the Convertr, which is probably adequate for small critters that don't travel very fast. The receiver can handle up to 28V! That's well and good, but make sure whatever decoder you choose can also handle that voltage.

I used a Tsunami because it was small yet powerful enough to handle the load of this particular critter. You can use the Convertr with higher-capacity boards as well, even "typical" boards we use in large scale. This would be an easy way to put battery power into a locomotive that might already be DCC-equipped from the factory, or perhaps you bought one second-hand. If you do that, you'll just have to make sure you don't exceed the 2.5-amp capacity of the Convertr.

In terms of what decoders will work with the Convertr, there's some ambiguity when reading the company's literature. The company's promotional flyer says it's compatible with any NMRA DCC-compliant decoder. On the company's website is an addendum to the instructions, which lists DCC decoders they've tested and shown to work well. However, that addendum says they don't list decoders that they've found don't work, while inviting the modelers to contact them with additional decoders that aren't listed that they have found to work. So, if you don't see your favorite decoder on their list, you really don't know if it's because they tried it and it wasn't compatible or they just haven't tried it yet. I'd like to see them list the decoders they have tried, along with the results, good or bad. If you have a specific decoder in mind, it's probably worth a call or e-mail to Airwire to see if they know of any compatibility issues.

Overall, I'm impressed. I like the notion of a universal receiver to which I can connect any generic DCC decoder of my liking. This way I can choose decoders based on features, sounds, or what-have-you, not just what works with the control system I'm using. The 2.5-amp continuous capacity should be ample for smaller locomotives, maybe even some medium-size ones. I'd love to see Airwire come out with a higher-capacity version of this for medium-to-large locomotives but, on the other hand, that's why they've got their "regular" boards with the motor and light control built in. **—Kevin Strong**

## Vital statistics

**Battery powered, wireless receiver**
**CVP Products**
**PO Box 835772**
**Richardson TX 75083**
**Prices: Internal antenna, $99;**
**external antenna (3"), $105**
**Website: *www.cvpusa.com***

"Convertr" onboard battery-powered R/C DCC command station with universal DCC output for use with any DCC decoder. Dimensions: Length, 2"; width, 0.8"; height, 0.3"

## Pros and cons

**Pros:** Small size allows for wireless, battery powered, DCC operation in small locomotives
**Cons:** 2.5-amp maximum output not suitable for larger locomotives with high current draw