

models of decoders, and you make the final selection by clicking on the type that it is (**Screen Shot 2**). You then can set the roster ID and decoder's address and save it to your roster (**Screen Shot 3**). Next, we fill in details for the roster entry, such as the road name and number, manufacturer, who owns the locomotive and the type of locomotive (**Screen Shot 4**).

At the top of the screen are several tabs for further configuration. Under the Basic tab, we have fields that have already been set for the decoder, the short or long address, the address, the normal direction of travel, and speed steps (**Screen Shot 5**). Should you have wired the motor leads backwards, or if you are a Southern Railroad or Norfolk & Western fan, you can set the direction of travel such that long hood forward is normal. If using speed steps, you can select 14 speed steps or 28 here. I will talk more about speed steps and speed tables later.

Under the Motor tab, we have settings for momentum, acceleration, and deceleration rates. We also have settings for back EMF, which is used to keep a constant speed at a given throttle setting regardless (within limits) of the demand on the motor by the weight of the train or going through several switches (which increases the drag on the locomotive). **See Screen Shot 6.**

Under Basic Speed Control, we can set V start and if available on the specific decoder V mid and V high. We can also choose to use a speed table for finer speed control if desired.

In the Speed Table tab, we can set the V start, V max, and several points in between. The curve can be any shape that you can imagine, a linear (straight line), constant ratio curve, or a logarithmic curve as shown (**Screen Shot 7**). You can set the voltage supplied to the motor at each speed step, making your own curve. You can also set the forward and reverse trim under this tab. This is useful in speed matching where you want a locomotive to run at the same speed in either direction at a given speed step. Motors and mechanical drives will not always run exactly the same in both directions.

Under the Function Map tab, we can configure and assign the lighting and sound effects to certain Function Buttons on the throttle (**Screen Shot 8**). With this particular decoder, any function can be assigned to any key, and functions can be combined under a given key. For example,

8	Extended Function Mapping	Forward	Reverse	Forward	Reverse	Emergency
		Driving	Driving	Standing	Standing	Stop Button
Headlight	F0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Backup Light	F0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FX3 Effect	F24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FX4 Effect	F25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dimmer	F7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mute	F8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Brake	F11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Half Speed	F14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Momentum Override	F14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grade Crossing Signal	F9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forward Signal	Disable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reverse Signal	Disable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stop Signal	F3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Drift Mode On	F5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drift Mode Off	F6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whistle	F2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bell	F1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Dynamo	F0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Short Whistle	F3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder Cocks	F4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Stop	F16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coupler	F13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coupler Release	F13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blowdown	F10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Johnson Bar	Disable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E-Brake App.	Disable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

we could program the Emergency Stop button to give one short whistle, dim the headlight, and turn on any number of other functions. This tab is one that will vary a lot by decoder. With this particular decoder, we can have the backup light come on when we press the reverse button, the headlight come on when forward is pressed, or keep the headlight on in both directions as shown.

Under the Lights tab, we can set up any lighting function that the decoder can generate: Mars Lights, Pyle Gyalite, Rotary beacons, ditch lights, and others. You can select incandescent lights or

LEDs. You will still need current-limiting resistors if using LEDs, but this function relates to how quickly an LED turns on compared to an incandescent bulb when using a special lighting effect where the light cycles on and off such as some of the above-mentioned lighting effects. For this particular decoder, there is a function to control the brightness of the light in the event your resistor selection was off a little. Plus it gives better brightness control of an LED than you can with a resistor.

The tab Analog Controls deals with sound and function if running on DC. I have run sound decoders on DC for dis-