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RM 30924

Portable Power for the LCCA Modular Railroad

The LCCA FasTrack Modular Railroad is a versatile design that encourages interaction between model railroaders. Different O gauge modelers can meet together and combine their individual modules to make very large layouts at conventions, train shows and special events. The resulting combined modular railroads can be as large as available space will allow and can operate the largest locomotives and cars that exist in three-rail O gauge. These combined modular layouts are powered by a single power distribution system that provides power to all trains and accessories on the railroad.

The Eastern Carolina Railroaders have built a simple and portable power distribution system for our modular railroad that can easily be used to power any other LCCA FasTrack Modular Railroad. Our power distribution system was used successfully at the National Train Show in Orlando, Fla., last summer to power the combined modules from three different modular railroad clubs. Our club had three objectives for our power system. First, it needed to be very easy to set up. Second, it needed to be easy to transport to train shows. And third, it needed to be easy to store in a manner that protected it from dirt and moisture.

Two Boxes

Our solution was to divide power between two custom-built plywood boxes. The first box contains all components required for track power (**Photo 1**). The second box contains the components for accessory power (**Photo 2**). The combined boxes deliver power to the modular railroad through a polarized eight-wire power cable that simply plugs into a short eight-wire cable attached to a terminal block on the underside of any module. These cables are cut from the same eight-wire cables with molded connectors specified by the LCCA/Lionel FasTrack Modular Railroad Specification Manual to carry power from one module to the next. The power cable could simply be connected to an existing module connector normally used to connect one module with another, but we prefer to have a separate module power cable so all modules remain electrically connected to adjacent modules at both ends. Our accessory power box is designed to feed accessory power to the

track power box, and then one cable from the track power box feeds all power to the modular railroad. However, each power box could deliver power independently to the modular railroad if desired. **Photo 3** shows the combined power boxes connected to our modular railroad by a single cable from the power supplies to one module of the railroad.

Our power boxes were built to fit into common plastic storage tubs available from many big-box stores. During operation at train shows the power boxes are usually placed on top of their storage tubs to raise them off the floor to a convenient operating height (**Photo 4**). The storage tubs protect the power supplies from dirt and make the power supplies easy to transport. Since power to the modular railroad is carried by only one cable, power connection to the modular railroad is quick and simple.

Experience at the National Train Show proved the wisdom of having a separate power supply for each track and accessory circuit. The track power box contains the equipment for the LEGACY command control system. Two Lionel power transformers, for tracks one and two, are mounted to the bottom of the box. A #992 LEGACY Command Base is mounted to one side of the box, and a multi-outlet power strip is attached to the back of the box to provide 120 volts of power to all the electrical components.

(**Photo 5**). Two #6-82883 PowerMasters, for tracks one and two, are mounted on the top of the box using long nylon wire ties (**Photo 1**). The PowerMasters provide the ability to run either command-equipped or conventional locomotives and provide high speed, self-resetting circuit breaker protection for the trains. A simple postwar transformer is also mounted to the top of our box to provide conventional power for track three, which we use to run a bump-and-go trolley. Track power is routed through an eight-terminal barrier strip to a cable that plugs into a polarized connector attached to the eight-



Photo 1 – Track power box



Photo 2 – Accessory power box

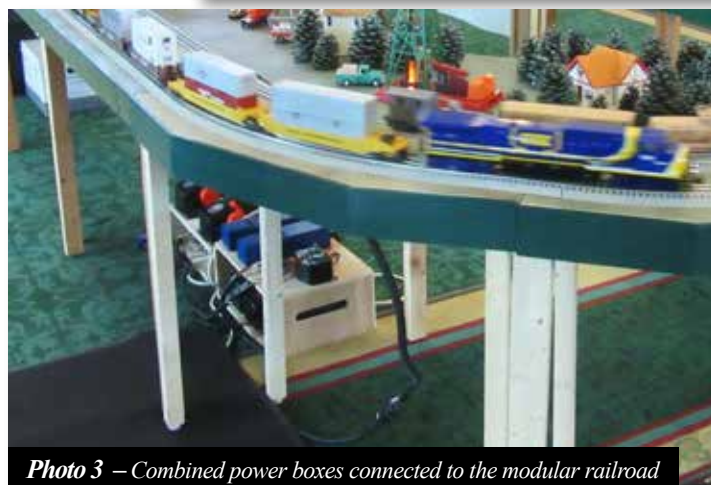


Photo 3 – Combined power boxes connected to the modular railroad

terminal barrier strip on the underside of one module (**Photo 1**). The wires attached to the barrier strip are organized, color coded and numbered according to the wiring specifications in the LCCA/Lionel FasTrack Modular Railroad Specification Manual.

The accessory power box holds three CW-80 transformers, one for each accessory circuit (**Photo 2**). The three transformers are screwed to the top of the box. (They are staggered to be able to fit within the limits of the size of the box top.) A multi-outlet

power strip is mounted inside the bottom of the box, and each transformer is plugged into the power strip (**Photo 6**). Each transformer powers one accessory circuit: “Variable voltage”; “High voltage”; and

connects modules with each other. Track power is carried by circuits nos. one, seven and eight. Circuit no. one (red) carries power to the outside loop of track (track one); circuit no. eight (white) carries power to the inner

accessory circuit no. four is designated “High voltage”; and accessory circuit no. six is designated “Low voltage.” The Eastern Carolina Railroaders Club modular railroad is set up this way, and our modules operated successfully when connected to the official LCCA modular railroad at the LCCA annual convention in Indianapolis.

Accessory voltages can vary slightly as required for specific modular railroads. The accessory voltages currently used on the Eastern Carolina Railroaders’ modular railroad are:

- Variable voltage: approximately 11 volts
- High voltage: approximately 14 volts
- Low voltage: approximately 9 volts

In general, High voltage accessories are motorized, either by modern can motors found in modern plug-and-play accessories or by older open frame AC motors like the motors used in the coal loader, bascule bridge, gantry crane, and whistle shacks. High voltage is good for many vibrator-powered accessories like the culvert loader/unloader, barrel loader, and the operating freight station. High voltage is also used for most solenoid-powered accessories like the gateman, switch tower, crossing gate, or oil well. Low voltage is used for lights and

for signals (to conserve bulb life) and is also good for modern motorized accessories that operate better at slower speeds like modern newsstands and their derivatives, the hot dog stand and animated passenger station. Low voltage is particularly good for log and coal dump cars to reduce their tendency to throw freight through the air. Variable voltage is used for voltage-sensitive accessories, particularly vibrator-powered accessories where speed is critical like the original newsstand and the horse and cattle cars.

In three years of operation of the modular railroad, setting up six to eight train shows per year, our portable power supply stores securely, is easy to transport and simple to connect to our modular railroad. Most importantly, it has been electrically reliable and has provided consistent, dependable power to our modular railroad. If you are building a modular railroad, this portable two-box power distribution system can be a simple alternative to a single large or heavy control panel. 🚂

Photographs by David Bjorkman



Photo 4 – Track and accessory power box connection



Photo 5 – Interior of the track power box

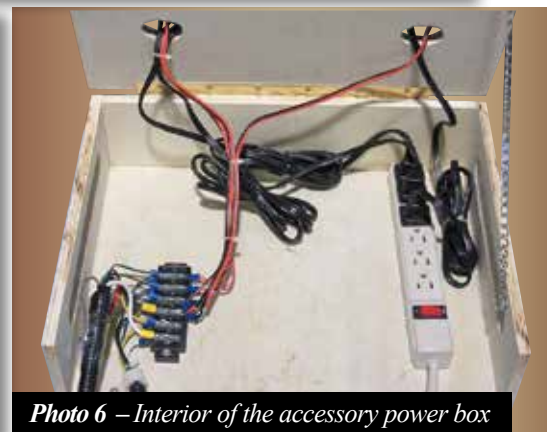


Photo 6 – Interior of the accessory power box

“Low voltage”. The output of each CW-80 transformer is routed to a six-terminal barrier strip visible at the lower left in **Photo 6**. A polarized six-wire connector cable is attached to the barrier strip and carries accessory power to the track-power box where it plugs into a short cable attached to the barrier strip on the power box where track power is attached. With all power connected to the same barrier strip, only one power cable is required to feed power to the entire modular railroad (**Photo 3**).

Modular Means Compatible

Compatibility is the key to successful operation when modules from different clubs or individuals are operated together. Both the track and the electrical power need to be standardized so that modules built by different individuals can operate seamlessly together. The LCCA/Lionel FasTrack Modular Railroad Specification Manual (available on the LCCA website) is very specific about track construction and placement on modules; however, it is only suggestive of power distribution, particularly for accessory power. There are eight wires (circuits) in the power distribution cable that

loop of track (track two); and circuit no. seven (yellow) carries power to an optional third track (track three). Circuit no. five (black) is used as a common return for both track and accessory power; circuit no. three (gray) is earth ground. Accessory power is carried on circuits nos. two, four, and six (green, brown, and blue). The functions and voltages of these accessory circuits are not specified. This allows flexibility for builders of modules, but it creates confusion and incompatibility when modules from different individuals are combined together at a train show or meet.

I propose that the accessory circuits for the LCCA Modular Railroad be standardized to ensure compatibility of all LCCA modules. Since the circuits are not specifically designated in the Specification Manual, I propose that we simply follow the voltage assignment that currently exists on the LCCA Modular Railroad that was built by TW TrainWorx and is set up and operated at every LCCA Annual Convention and many Special Events. On the official LCCA modular railroad, accessory circuit no. two is designated “Variable voltage”;