

# The Short & Nn3 Arrow

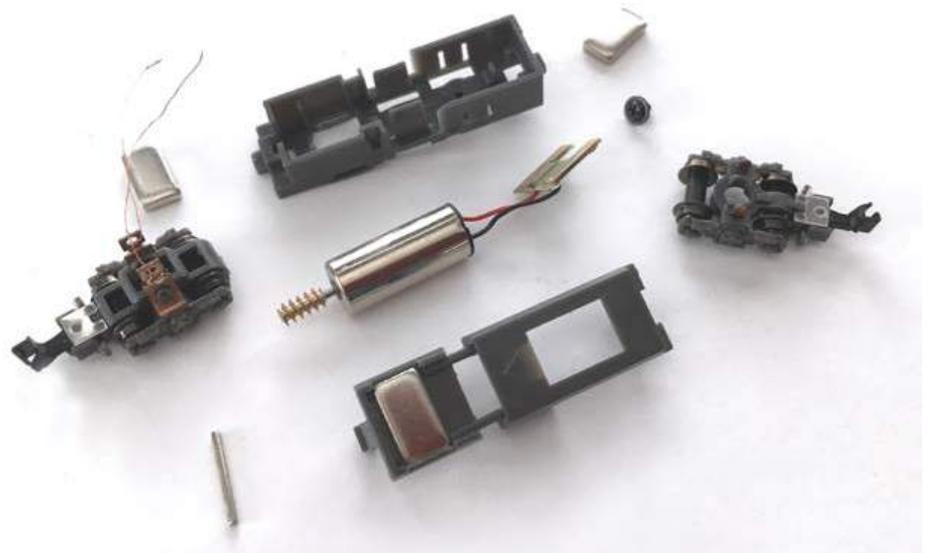
Using Rokuhan Power in a Showcase Shay...  
and Nn3 at the National N Scale Convention

by Tom Knapp, MMR#101



The last issue of *N-Scale Magazine* included a review of Rokuhan's "Shorty" powered and un-powered B-B locomotive chassis. These small eight-wheel chassis were designed to carry different caricature-like superstructures mimicking different Japanese railway equipment. However, being the devious narrow-gauge modeler that I am, I immediately saw the potential for using these in Nn3. The first project was the simple box cab shown in the review in the September/October issue, not requiring any modification of the Rokuhan chassis. (I did add a resistor to "speed match" it to my other equipment, and a pair of diodes so the headlights come on before the box cab starts moving – more about this below.)

As promised last issue, I am now going to show how easy it is to adapt these simple power units to a Showcase Miniatures Class B Shay kit. This build will utilize not only the drive portion of the Rokuhan, but also the front truck with its all-wheel electrical pick-up. Construction of the Showcase Miniatures 30-40-ton Class



**Photo 1:** Disassembled Rokuhan Shorty: The plastic top is at the bottom. The plastic chassis we will use is at the top; the PC board pad is still attached to the motor; this Shorty has the Micro-Trains-compatible couplers.

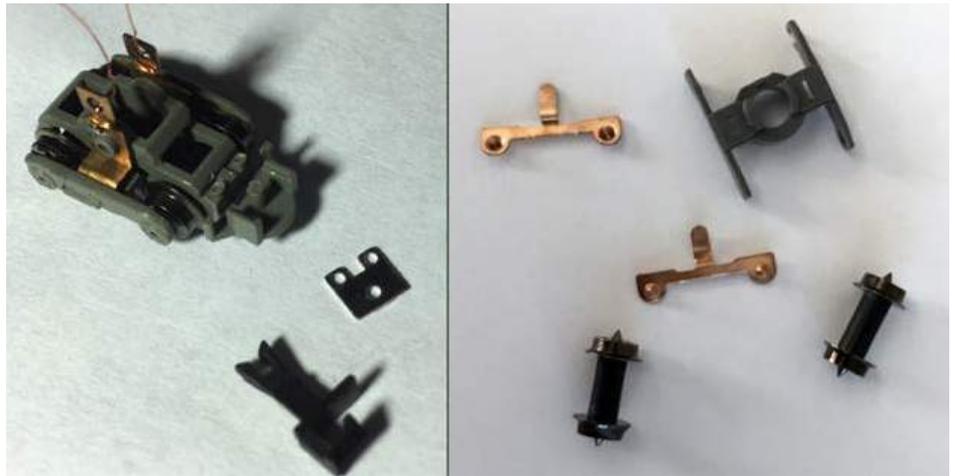
B Shay (kit 5002) has been covered in detail in a previous issue of *N-Scale Magazine*; this column will focus on the modifications needed to adapt the kit to Rokuhan power. (If you decide to try this adaptation, I suggest you use Rokuhan's model SA002-1 as it has the plainer side-frames of the

two.) I will show the installation of a DCC decoder, and a DC version at the appropriate stages of the build.

## SHORTY DISASSEMBLY

The Rokuhan chassis is made up of two injection molded plastic pieces: the frame and the top. The top includes a

molded-in arrow indicating the front of the loco, recesses for a weight and (I am told) for the proposed future Rokuhan DCC decoder, and really serves no other function. It can be simply popped off by slipping a small screw driver under each end. Within the frame portion is a small PC board (probably with other future uses), the motor and worm, and wiring from the front truck to the PC board and from there to the motor. The power truck is retained by a 1mm steel shaft through the gear tower and slots in each side of the frame, while the rear truck is retained by a screw from below and has contacts which ride on the bottom of the PC board. All simple, basic stuff elegantly executed. First step is to pop off and set aside the plastic top. Then using the tip of a small screw driver to depress the tabs at each side, pop out the PC board. Pop out (yes, just “pop out”) the motor, which is held in by the two curved portions of the frame. Clip or unsolder all four wires from the PC board, then slide the steel pin out from the front truck gear tower, removing the truck; be sure you slide the steel

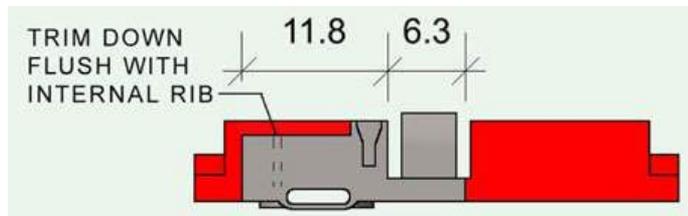


**Photo 2:** Trucks: on the left is the “front” truck which will be the rear truck in the Shay, with the Rapido-style coupler and coupler box top removed: the box will be cut off flush with the main body of the truck; on the right is the “rear” truck which will be the front truck on the Shay, disassembled so the metal inserts can be modified: the coupler box has already been cut from this truck. (Note: These are the trucks from the SA002-1 which has the simple side frames.)

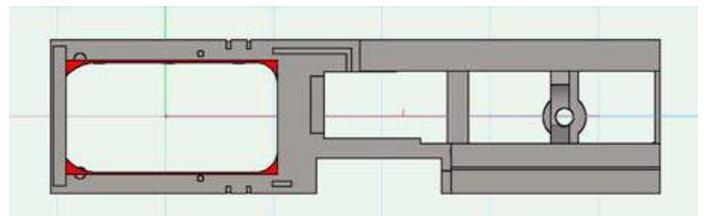
pin back through the truck to avoid losing the worm wheel. Then remove the screw and front truck from the frame (*Photo 1*). Remove the couplers (pull straight out) cut off the coupler boxes, then disassemble the rear truck (which will become the front truck of the Shay) as shown in *Photo 2*.

#### FITTING TO SHOWCASE SHAY

Following *Figure 1*, cut away portions of the frame leaving the rectangle which holds the front truck and the motor. (Note: the “front” of the Rokuhan chassis will become the “back” of the Shay – an important consideration when dealing with electrical wire color codes later.) This gray



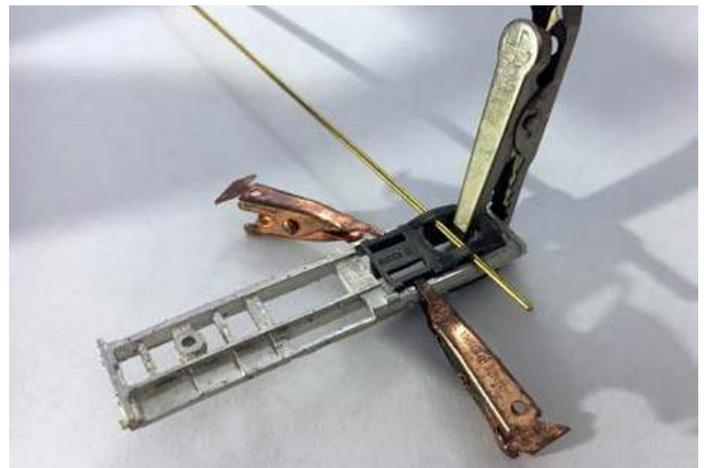
**Figure 1:** Cutting diagram for the Shorty chassis. Dimensions are in millimeters, measured both directions from the edge of the slot ahead of the “claws” that hold the motor.



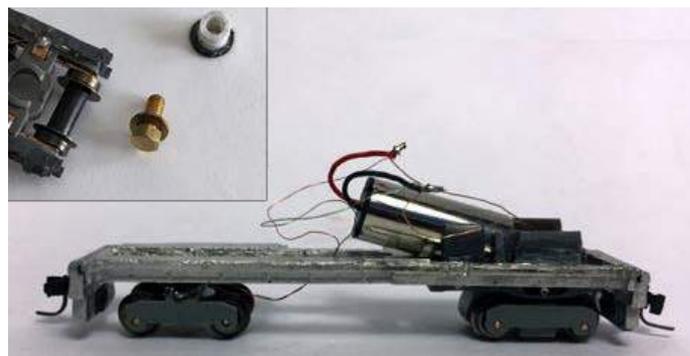
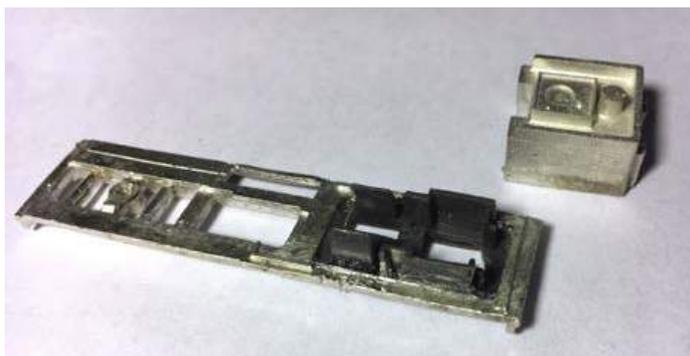
**Figure 2:** Minimal filing of the opening in the Showcase frame is required to fit the cut-down Shorty chassis. (CAD file courtesy Showcase Miniatures.)



**Photo 3:** In the background is an un-modified Rokuhan Shorty; in the middle is the cut-down Shorty chassis (note it has been sanded on the sides); in the foreground is Showcase's frame filed as shown in *Figure 2*.

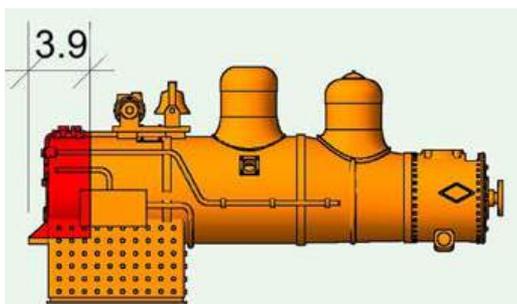


**Photo 4:** Gluing the Shorty chassis into the Showcase frame: a 1mm brass rod is placed through the Rokuhan chassis and the parts clipped tightly and squarely together with the rod tight to the bottom of the Showcase frame before flowing CA adhesive into the joints.



**Photo 5:** The Showcase Shay frame with the Rokuhan Shorty sub-frame glued in place; although not visible, the inside of the water tank has been shaved away with a dental burr in a motor toll to a slip-fit over the Rokuhan plastic part.

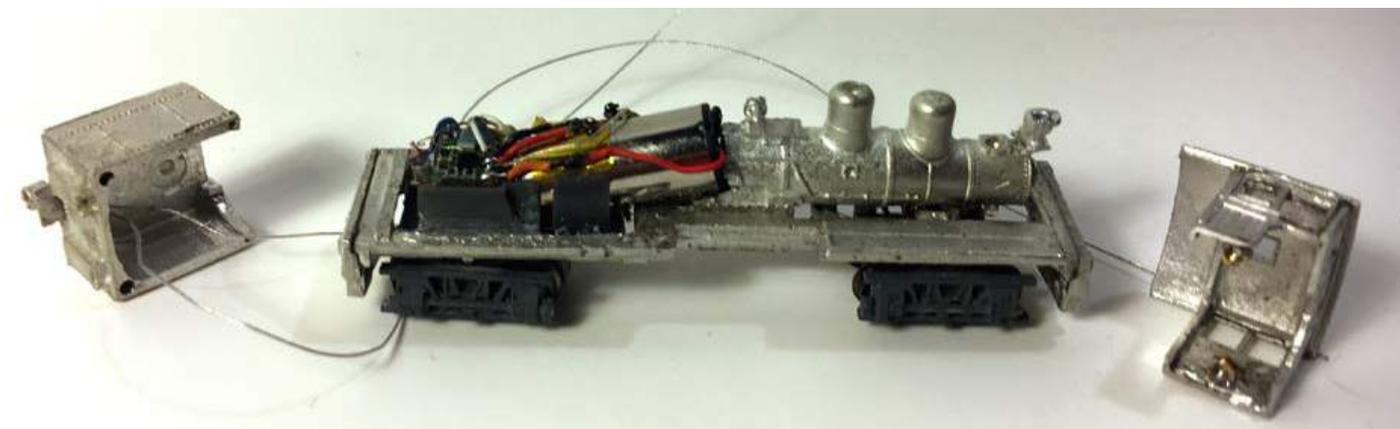
**Photo 6:** The chassis assembled enough to test run; inset: the 1/8" styrene bushing and washer used in mounting the front truck and bent-over truck insert with leads soldered on. Note the detail has been filed off the truck side frames.



**Figure 3:** Cutting diagram for modifying the boiler casting. (CAD file courtesy Showcase Miniatures.)



**Photo 7:** This bottom view shows the 00-90 screw which holds the boiler casting in place to finalize alignment prior to gluing it in place. Also visible are the holes for attaching the water tank and the cab.



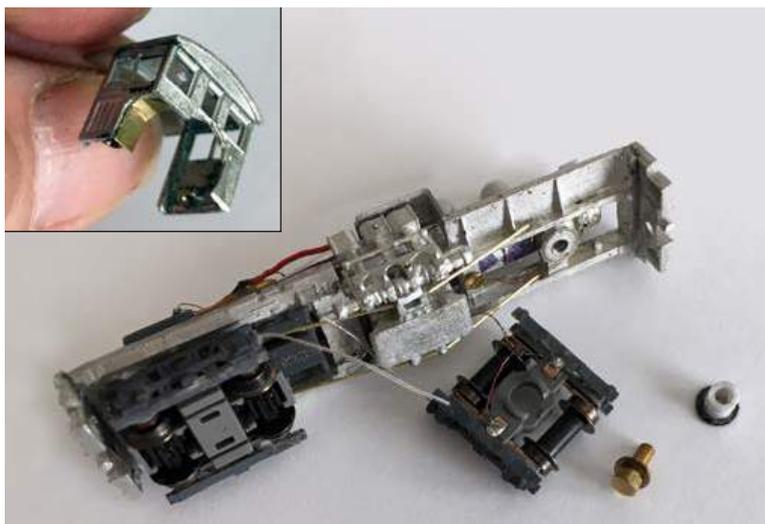
**Photo 8:** The cab sides and front were soldered together then 00-90 nuts soldered onto the inside of the side walls; the roof was glued in place with CA adhesive. Also note the mounting holes in the bottom of the water tank: two holes on diagonal corners were used.

plastic housing is slightly wider than the interior of the water tank (tender) on the Showcase Shay, so I filed a little off each side with sandpaper glued to a block of wood. I was not trying to get it to fit completely up inside the tender as I still wanted the plastic housing to be a tight fit up in the opening in the Showcase foot plate. On the Showcase Shay, file the rounded corners of this opening to square them up (*Figure 2*), and widen the opening a bit out to the pins cast into the top which locate the aforementioned water tank (*Photo 3*).

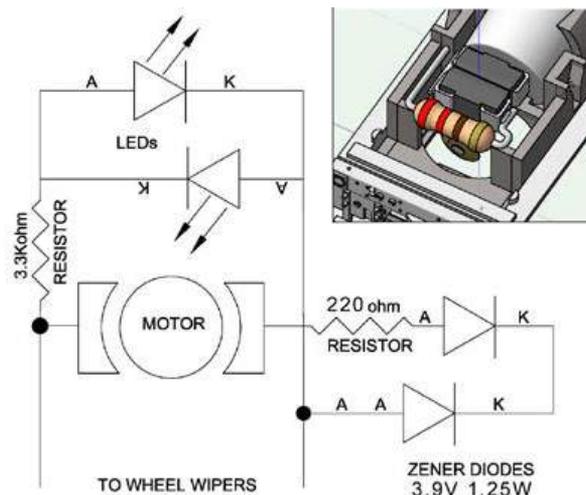
The gray plastic housing should be a tight fit into this opening. I then used a length of 1mm diameter brass rod run through the slots in the frame and clips to hold the housing square and tight in the frame opening and applied CA adhesive to the joint (*Photo 4*). Note: I did some "dry fitting" of parts together to assure this assembly would put couplers at the correct height. I let this cure for a couple of hours before removing the rod and clips. I then fitted the water tank to the housing, using a dental burr in a motor tool to gradually shave away

a bit of the interior until I had a snug friction fit, making sure I left the locating holes intact. I then set the water tank aside (*Photo 5*).

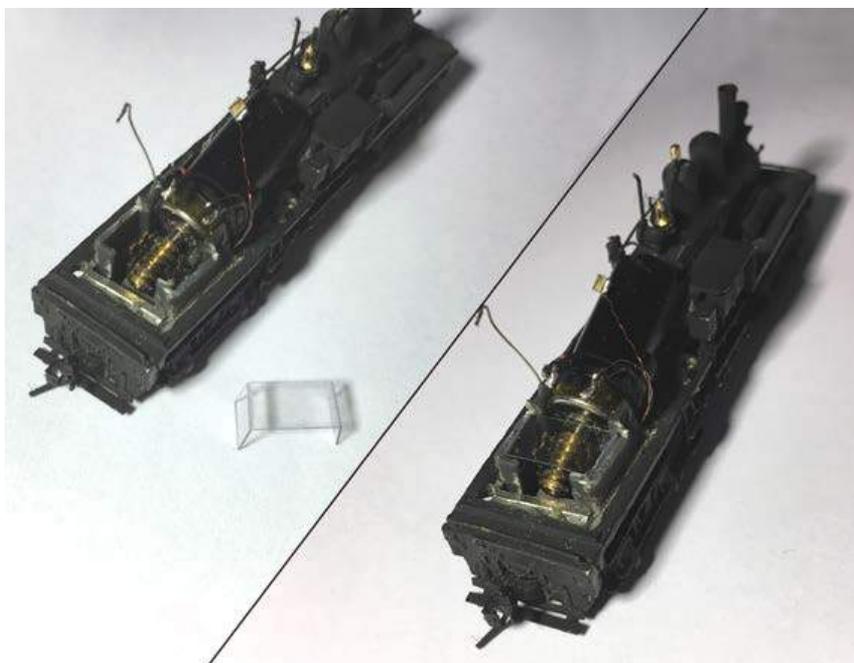
At this point, I added the front and rear pilot beams with their MTL couplers and attached the trucks after soldering wire leads to the modified front truck metal inserts, making a spacer bushing from 1/8" styrene tube, and sanding the detail off the sides of the trucks. I snapped the motor in place and attached the wiring (*Photo 6*) and tested. After testing, I switched the



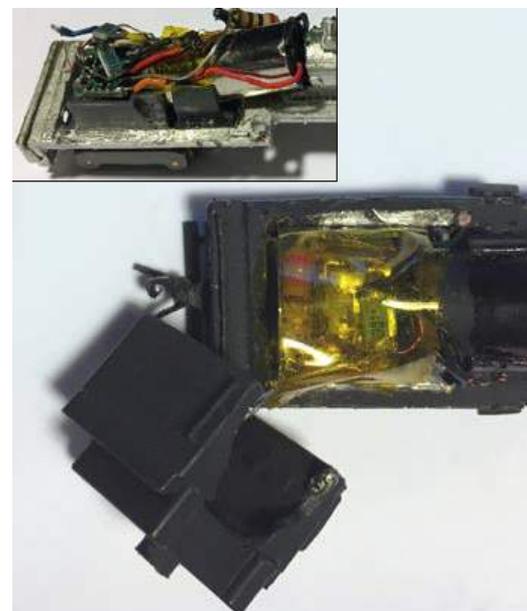
**Photo 9:** With the engine installed, the cover of the cylinders was cut at the front of the cab and installed over the cylinders. The remainder of the cover was fabricated from brass and glued to the interior of the cab (inset).



**Figure 4:** Electrical diagram for LED lighting and adjusting locomotive speed to more closely match that of other equipment used on the layout; inset shows a pictorial representation of the diodes and resistor layout.



**Photo 10:** A little out of sequence, but this photo shows the clear plastic "saddle" which covers the work and the wire connections to the rear truck, both outside of the chassis (left) and installed (right).



**Photo 11:** The two Zener diodes, 220-ohm carbon film resistor, and surface mounting lighting resistors all inside the water tank area of the Shay. Inset: a comparable installation using a DCC decoder: this one a CT DCX77z. The ESU Lok Nano Standard will also fit.

front and rear axles in the rear truck to put the traction tires towards the rear of the locomotive. (These easily snap out and in.)

Cut away a portion of the Showcase Miniatures boiler casting as shown in *Figure 3*. The boiler can then be installed on the frame touching the front of the motor; this should put it about 1mm forward of the designed location. I like to drill a hole through the frame cross member and another hole in the bottom of the boiler and use a screw to hold the boiler in place until

everything is aligned before adding CA adhesive to the contact areas (*Photo 7*). I drilled and countersunk holes in the Showcase frame aligned with holes in the water tank and the nuts on the inside of the cab (*Photo 8*). Shay truck sideframes made by Showcase specifically for this Rokuhan conversion (Showcase Part No. 5014) were glued to the sides of the Rokuhan trucks, and the three-cylinder engine glued in place, shimmed out slightly with .030" styrene shims to align with the truck side frames. The cover over the

cylinders was cut off flush with the front of the cab, and the remainder of the cover fabricated from brass and glued to the inside of the cab (*Photo 9*). To access the motor in the future, I soldered 00-90 nuts to the insides of the cab side walls to receive 00-90 screws run up through holes in the frame.

#### **SPEED MATCHING: TO DCC OR NOT TO DCC**

The gearing in the Rokuhan chassis tends to mean the loco starts very quickly and ramps up to high speed



**Photo 12:** The finished Shay working the Caspar, South Fork & Eastern. Railroad: left: engineer's side; right: fireman's side.



**Photo 13:** Jim Wanlass' Showcase Miniatures Class A Shay won First Place in Steam Locomotives at the 2018 National N Scale Convention in Salt Lake City, shown here on his "Pizza Box Layout." (photo by J. Wanlass)



**Photo 14:** Chuck Short's D&RGW combine/caboose "Pagosa Springs" photographed by Chuck on the Belmont Shores Club layout won First Place in the Caboose Category at the 2018 National N Scale Convention in Salt Lake City (photo by C. Short)

with very little throttle from most DC controllers. ZTrack makes an adapter cable for use between a conventional DC controller and the track which provides more control, but if you mix locomotive manufacturers as we do on our modular Nn3 layout, this is not a workable solution; a method needs to be found to adjust the voltage to the motor within the locomotive.

For DCC, the starting voltage, mid-range voltage and maximum voltage can be adjusted in a DCC decoder using CVs 2, 5 & 6. However, our modular logging layout is currently operated with a Varipulse DC throttle, so I installed the same DC hardware I employed in the box cab shown in the Sep/Oct review

and as described earlier in this column: a pair of diodes to use the first 3VDC (allowing the LEDs to turn on before the motor starts up) and a resistor in series with the motor to reduce the throttle sensitivity (*Figure 4*). Prior to adding the electronics in the water tank, I bent a small strip of plastic (5.5x18) into a "U" shaped saddle and slipped it down into the Rokuhan chassis over the top of the worm and the electrical contacts on the rear truck (*Photo 10*). The installation shown in *Photo 11* uses a typical "carbon film" resistor for the motor speed, and surface-mount resistors for the LEDs. I have ordered some surface-mount 220-ohm resistors for motor speed control, as well for future

installations, which should take even less room. (For those interested in the evolution of this hardware solution, see the video at: [youtu.be/1TPYGS0cxv0](https://youtu.be/1TPYGS0cxv0) ). For those installing DCC, a CT DCX77z or ESU Lok Nano Standard will fit in this same space.

#### FINISHING UP

The remainder of the construction of the Showcase Shay has been described in earlier issues. The only real deviations from those descriptions and the included instructions which I employed in this build (and consider necessary) are using screws to attach the water tank/fuel bunker as an assembly and the cab to the locomotive frame. The



**Photo 15:** DCC-equipped standard gauge Showcase Class B Shay on Jim Tate's layout; the Showcase tow truck was built by Raul Perez (photo by J. Tate)

water tank has enough meat in the casting to drill and thread for 00-90 screws. The finished locomotive is shown in *Photo 12*.

### Nn3 WINS BIG AT THE NATIONAL N SCALE CONVENTION

Bruce Moessen was attending this year's National N Scale Convention in Salt Lake City and reported to me that a Nn3 locomotive won first place in the steam locomotive category, and a Nn3 caboose won first place in that category. I contacted the convention organizers and was put in contact with the two Nn3ers, who kindly provided photos and a description for use in this column.

Jim Wanlass built a nicely detailed and weathered Showcase Miniatures Class A Shay in the Mich-Cal Lumber Co. No. 2 configuration (Photo 13). Jim has an Nn3 branch line on his "Pizza Box" N scale layout. NMRA members will recognize Jim as the author of the series of articles "My Quest for Master Model Railroader" in the *NMRA Magazine*. You can follow construction of Jim's N scale layout (which includes the Nn3 branch) at: [jamestowntrains.com/jims-pizza-box-n-scale-layout](http://jamestowntrains.com/jims-pizza-box-n-scale-layout).

First Place in Caboose was won by Chuck Short for his model of D&RGW



**Photo 16:** RLW's kit for Uintah Mallets 50 & 51. This requires a Märklin 88291 or 88292 or 88293 (the later has full valve gear.) The kit includes about 40 white metal castings, some brass etchings, castings and sheet brass, other bits and pieces and a full set of detailed instructions.

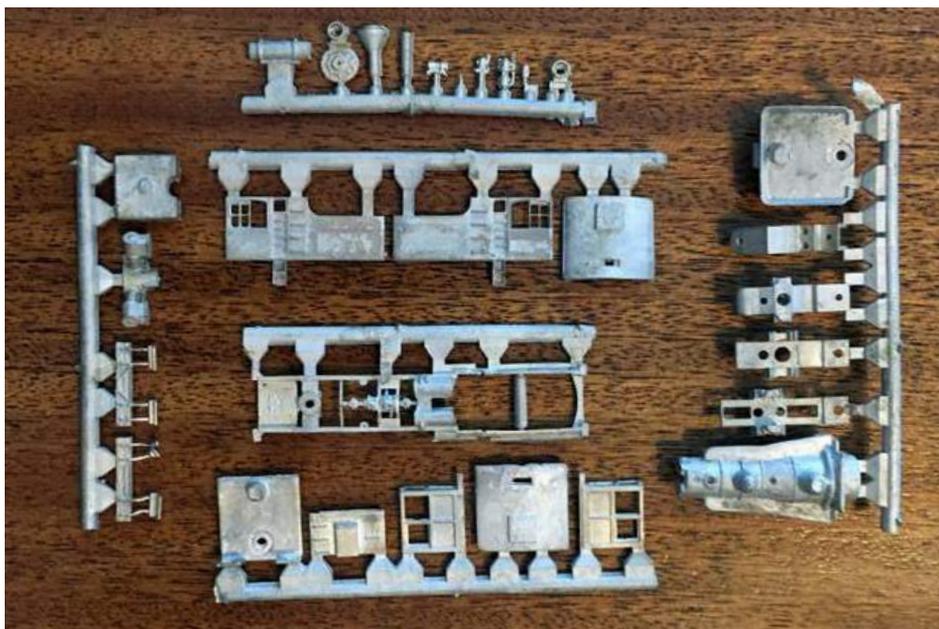
combine/caboose No. 215 (the Pagosa Springs) (*Photo 14*). This was an ingenious kitbash Chuck describes in the sidebar. I have built RLW's kit for the same car and must say Chuck's kitbash looks much better than my efforts!

### STANDARD GAUGE SHOWCASE SHAY

Last issue I described building a standard gauge DCC-equipped Showcase Class B Shay. The owner – Jim Tate – sent along a photo of the loco working his layout (*Photo 15*).

### MORE MALLETS:

The series on building the logging Mallets no sooner hit the street than Marshall Thomson of Republic Locomotive Works contacted me to say he has a kit for the Uintah Mallet – kit no. RLW 2150: [www.republiclocomotiveworks.com/show\\_item.php?ID=1167](http://www.republiclocomotiveworks.com/show_item.php?ID=1167) (*Photo 16*). I just received this kit from RLW and will be building it for a future review. I also just received a set of pre-production white metal castings for RLW's Heisler kit, which should be out by the time you read this column (*Photo 16*).



**Photo 17:** Pre-production castings for RLW's Heisler kit; it comes with both an open and an enclosed ("all weather") cab.

## HEISLER ON ITS WAY

I received pre-production castings of RLW's new kit for a Heisler, and they look great (*Photo 17*). Disclaimer: I designed and did the pattern work for this kit, so am a little prejudiced. It should be available by the time you read this. I will build one of these up for a future review.

## FINALLY:

... please e-mail me at [thomasknapp@att.net](mailto:thomasknapp@att.net) with your comments, questions, and ideas for content. I would especially like to see the modeling of other Nn3ers out there that I could share with the readers of this magazine. Also, manufacturers who have narrow gauge and shortline products and other products which help model the 19th and early 20th century, please let me know. 🚂

# Constructing Pasoga Springs

by Chuck Short

## Materials

- 1 MDC Overton coach
- 2 MDC Overton Baggage cars
- 2 MDC Overton roofs
- 1 MDC Overton underframe
- 3 MDC Caboose cupolas
- 1 MDC Overton underframe
- 4 MDC Overton Truss rods
- 1 Top mount light and smoke-jack from an old Trix wood caboose
- Brass wire and ladder material
- 1 pr. Micro-trains Nn3 Passenger trucks
- 1 Pr. Micro-trains Nn3 couplers
- 2 Micro-trains wood roof walks

Construction begins with the body. The coach body was cut so the right side has five windows, and the left six, leaving the sill rail extended 7 scale feet, with the lower body panels attached. One baggage car has enough siding with the baggage door to provide the left side material to "notch" to match the previously cut passenger portion of the car. The other side is a little more complicated, as the second baggage car side must be spliced into three pieces to provide the proper spacing of the door, to match the other side. Add brass bent to handrail shape and add to sides of baggage doors. The cupola is quite complicated and has 16 pieces! The windows are quite short, compared with the normal caboose. To raise the bottoms of the front and rear windows, the bottom section of each window must be cut out, up to the scale height of 1¼ scale feet, top to bottom. Now the hard part, since the board spacing on the cupola is different from the body, the donor pieces to raise the bottoms of the windows must come from the other two cupolas. The desired pieces are cut



from the center of the ends. They must be a little wider than the cuts in the first cupola to provide careful final fitting. The tops of these four pieces must have the top filed down to make them flat, but with the top representing the lower sill of the end windows. The bottoms may be trimmed after an .080" strip of styrene is added to the bottom side of the cupola to raise it up to the right height. It may need to be filed to the right height. Wire hand rails may be added at this time, as well as the top mount light from the Trix wood caboose. The underframe was made by cutting the Overton 36' frame just past the truck bolster on both ends, using these bolsters for the trucks. Cut the Overland 50' frame to fit in between the bolsters, file the sides down to fit inside body lip and drill holes to add the truss rods to match the stringers. The roof detail is added with the roof walks trimmed to fit the right side of the car (looking at the car, the baggage door is on the left and

the windows on the right). Mount them level and add four very small wedges on the left portion, and five to the right, being careful not to disturb the position of the walk. There is the Trix smoke-jack mounted right in the way of the right side walk; it is centered right above the boarded section of the end of the right side. Drill the hole carefully and mount. The safety rail on the roof is made from brass wire. Bend the ends to conform to pictures. Drill and glue in place. Stanchions may be spaced 5 scale feet apart, starting from the cupola ends. Drill holes for them, bring them up from the bottom and glue them to the bottom of the railing. End ladders are trimmed so the top rung is bent 90 degrees and glued under the roof walk. Paint is Pullman green on body roof vertical surfaces and cupola, black paint on roof, cupola roof ladders and all handrails. Add trucks and couplers. You're done! 🚂