Instructions for HO Scale 90', 105', 120' & 135' Turntable Assembly

Kit Contents:

1 ea. 1/8" Acrylic Pit floor
1 Set 1/8" Acrylic Parts Sheet
1 Set 1/16" Acrylic Parts Sheet
4 ea. Wheel Bearings
4 ea. Brass Axles
1 ea. Bronze Flanged Sleeve
1 ea. 1/4" Brass Rod
1 ea. Metal Turn Block with set-screw

Hook up Wire
2 ea. Curled Rails
2 ea. Straight Rails
2 ea. Brass wipers
4 ea. 1/16" x 1” square styrene rod
8 ea. 1/8" x 1” styrene tube
Instructions and Drawings.

Thank you for purchasing this kit. Please read these instructions completely before beginning and take your time. Allow parts to dry after painting or gluing and do not try to build this in one night.

Drawings of all the parts have been included for ease of part identification. If by chance a part is missing or broken, please contact us indicating the kit name and part number and we will send you a replacement.

You will need the following items to assemble your model: Sharp hobby knife, file, paint (see “Painting Your Model”), paint brushes, glue (see “Gluing Acrylic”), modeling putty, masking tape, soldering iron & solder.
Please note that parts of the kit have been painted gray in the assembly photos so that new parts can easily be seen and identified. This is only for ease of identifying parts and seeing them clearly in the photos. We recommend glueing all parts together prior to painting unless otherwise noted.

**Gluing Acrylic**

Always glue acrylic in a well-ventilated area, and read the glue manufacturer’s label for instructions.

We recommend using Tennax 7R or Plastruct brand “Plastic Weld Solvent Cement” (PPC-2 or PPC-16) or “Bondine Solvent Cement” (Bond-2 or BOND-16). Most hobby shops carry these products.

Acrylic must be glued together using a solvent that will melt the two edges and literally fuse them together. To do this, place the two pieces to be joined together and run a bead of solvent down the edge. Capillary action will suck the solvent into the joint and after several seconds the pieces will be fused. After only a few minutes the pieces will be strong enough to work with. The bond will be completely dry within twenty-four hours using the above-mentioned products.

Solvent can be dispensed two ways. Typically the solvent comes in a small bottle with a brush in the lid. The brush allows you to dispense a drop or two of solvent at a time. You may want to use a polyethylene bottle or syringe with a blunt needle dispenser. This allows larger amounts of solvent to be dispensed quickly and cleanly. Be sure the bottle you are using is approved for the solvent you are using or you may melt through it. These may be purchased from CMR. Glue the metal pit rail in place using super glue (CA), as well as several other parts where indicated.

**Preparing Your Model for Painting**

Lightly sand all parts to remove the raised edge created during the laser cutting process. In order to hide any seams use “hobbyist putty” such as Green Squadron modeling putty. You may also want to fill and sand the sides of the pit wall so that they are smooth. Do this in a well ventilated area. Apply the putty over the seams; allow to dry overnight. Once the putty has dried use a sanding block to smooth. You may need to apply a second coat of putty and sand again. Sometimes it is necessary to sand or file the tabs slightly in order to get them to seat themselves into the slots. This is due to slight variations in acrylic thickness. If the tabs are not fitting into the slots you may need to file them back at an angle to fit properly.

**Painting your Model**

Prime the pit with grey primer and then paint a concrete color. We used Krylon Grey Primer and Krylon Camouflage Khaki or Polly Scale Acrylic Concrete. Paint the bridge black or dark grey and the wood walkways brown. A good wash of black will give the entire structure a nice used look.
**Building the Pit**

Place the pit floor flat with the engraved side facing up and insert the eight 1/8" styrene alignment rods into the holes around the perimeter of the pit and glue in place. Make sure they are square with the pit floor. Place four of the narrow 1/8" thick pit wall section over the alignment rods to form a ring. Make sure the male/female nubs on the ends of the parts align together. There will be a small gap between the wall sections. See Figure 1.

![Figure 1](image1)

Place another ring on top of the first, off-setting the seams so that they stack like bricks. Continue up with a total of six layers in this way. Glue all the wall sections together, be sure that everything is straight and flush. See Figure 2.

![Figure 2](image2)

Glue the wide 1/8" thick pit flange parts on top of the pit wall sections using the alignment rods. Cut the alignment rods off with a sharp knife and sand or file flush. See Figures 3 & 4.

![Figure 3](image3)

![Figure 4](image4)
Attach the 1/16" pit flange parts, offsetting the seams. While the glue is still soft, flip the entire pit upside down and check that the flange is glued on flat and square with the pit by pressing it down onto a flat surface. See Figures 5 & 6.

Fill the sides of the pit walls with modelers putty and let dry. Sand when dry and repeat until they are smooth. See Figure 7.

Prepare the pit floor by checking that all of the slots are clear. Place the pit rail “ties” into the slots around the perimeter of the pit floor with the sloped side facing towards the center. Place about a quarter of them in at a time and then go back and glue them in place. There will be a little play in the fit, push the ties towards the front of the slot (towards the center of the pit) as you glue them in place. This will ensure that they all line up perfectly. See Figure 8.
Install the pit rail into the grooves along the pit ties. You will have to cut the rail to length using a cut off wheel or rail nippers. The two rails should meet exactly 180° from each other and a small gap should be left between the rails. There should be a small hole next to each rail to be used for wiring later. Use the engraved lines on the pit floor as a guide for this. It may help to use needle nose pliers to seat the rail squarely in the ties. See Figure 9 for location of gaps and wiring holes.

Install the first rail and cut it off when you have gone halfway around the pit. In the 90' cut an additional gap 12 ties from the end of the rail as shown in Figure 10. In all other sizes, cut an additional gap 11 ties from the end of the rail (Note: the short section of ring rail must be longer than the span of the two wheels on one truck of the bridge). Glue a 1/16” square rod of styrene in the rail gap to act as an insulator. Glue the styrene to the rail and the pit floor to hold it in place. Attach the rail to the ties with “Gap Filling CA” dabbing it along the back side of the ties where it will not be seen as much. See Figure 10.

Install the second rail in the same manner and glue styrene into all the gaps to act as insulators. Be sure to cut the rail a little long and nibble it back so that your joints are as tight as possible.

When the glue is dry, cut the styrene insulators flush with the top of the rail and file flush if necessary. The top of the rail and the styrene should be perfectly flush so that the truck wheels do not bump or get hung up on them. See Figure 11.
Wiring the Pit

Note: you might want to come back to this later after completing the rest of the turntable so that the wires are not in your way while working on the bridge.

Wiring is similar for DC and DCC operations. The bridge track is powered by the split ring rail. Each bridge rail receives power from one side of the pit rail via the bridge truck. When the bridge turns 180 degrees the trucks swap sides and the bridge track power is automatically reversed. The short sections of ring rail create a transition zone so that a wheel is not on both sides of the split ring rail at the same time. All four sections of rail will be powered so that if you have DCC sound locomotives you will not loose power and sound.

Attach a wire to each of the four sections of ring rail. There is a small hole in the pit to feed the wire thru. Solder the wire to the back side of the rail.

The two long rails are connected to your main power for your track. If using DCC connect them to your track power bus. If using DC connect them to a track block.

If you are using DCC, connect the two short sections to a DCC polarity controller (Digitrax AR1, Lenz LK200, MRC AD520 or similar). You do not need to wire them if you are using DC.

See Figure 12.

Painting the Pit

Paint the pit as described in “Painting your Model”. When dry apply a black wash and let dry. Remove the paint from the top of the pit rail with a sharp knife and polish clean with fine sandpaper or a track cleaning pad.
Assembling the Bridge

Place a girder flat with engraved side facing up. The long end with the tabs is the top. Glue angled braces onto the side of the girder, using the two smaller braces on either end. Use the vertical engraved lines for alignment to keep the braces square. Be sure to file any excess material off the tab where it attached to the parts sheet. In the next step tabs will be inserted into the slots from the other side. This will prevent them from abutting and allow them to seat properly. Repeat with the second girder. See Figure 13.

Flip the girder over. Begin by filing off any excess material from the center braces so that they will not abut the sprues from the side braces inside the girder slots. Glue the two inner braces onto one of the girders and the turn block spacer at the top of the girder making sure it is perfectly square. (Note: there is not a center brace in the middle of the bridge.) Continue glueing center braces on, using two shorter braces on either end. Use the side braces for alignment. See Figure 14.

Glue the two girder assemblies together making sure everything is seated and perfectly square. The girders and interior braces should align perfectly to create a rectangular hollow in the center of the assembly. Once assembled check that the metal turn block fits inside of this hollow with just enough play to get it in and out. See Figure 15.
Glue the girder assembly to the deck, making sure the engraved side of the deck is the correct orientation. This is most easily achieved by placing the deck on a flat surface with the engraved side facing down. Insert the tabs on the top of the girder assembly into the slots on the deck, making certain the girders are flush against the bottom of the bridge platform and the ends are aligned. See Figures 16 & 17.

![Figure 16](image16.png) ![Figure 17](image17.png)

With bridge assembly facing upright, glue the walkways on with the engraved side facing up. The walkways have a specific orientation and are slightly curved on the ends. Glue each walkway on so it aligns with the outside engraved line (to indicate rail placement). Also, the notch in the walkway should line up with the hole in the deck for placement of wire. See Figures 18 & 19.

![Figure 18](image18.png) ![Figure 19](image19.png)

Lay rail on bridge. The rail will be longer than the length of the bridge and any ends that hang over will be shortened later. With a marker, indicate where the notch for the wire on the walkway meets the rail. Repeat with second rail. See Figure 20.

![Figure 20](image20.png)
Completely strip insulation off of the wire and solder to outside edge of rail where you have indicated the location of the notch. See Figure 21.

Thread the wire down through the notch and hole below until the rail is flat on the deck and between the engraved placement lines. The rail should be flush with the side of the walkway provided the walkway was glued in square. Glue the rail in place using CA. Make sure the rail is flat when glueing and not curling from the wire. Repeat with other rail. Use a track gauge to be sure the rail is in gauge. See Figure 22.

Flip assembly over and thread wire through the hole in the side of the girder. Once inside the girder assembly, the wire can be fished back to the truck to provide power. Note that there are holes in both ends of the girders, making 4 holes total on the assembly. Only 2 of these holes are needed, the extras being useful in the event that anything is glued up backwards. See Figure 23.

Paint assembly black. Once the paint has dried, carefully sand paint off of rails and hand paint the walkways brown.

Trim the rails flush with the ends of the bridge, following the curve of the deck. File the inside edge of the rail at each end at an angle. This will help guide the wheels on to the rail if it is not perfectly aligned with the track leading into it. See Figure 24.
Truck Assembly

To make one truck assembly, glue 4 axle braces as shown into the slots on the truck. Make certain that the axle braces are perpendicular to the curved edge of the truck. Repeat to make a second assembly. Note: you may want to paint the trucks black at this point so as to keep the wheels clean. See Figure 25.

Place a wheel onto each axle. You will need to tap the axle into the wheel with a tap hammer. To do this drill a hole in a piece of wood slightly larger than the axle, but smaller than the wheel. Place the wheel over the hole and tap the axle through the wheel into the hole. Equal amounts of the axle should stick out of either side. Make sure that the end you hammer is not too deformed; if it is, reshape with pliers. “Snap” the wheel assembly into the axle brace. Note: once this is done the wheels do not come out. Glue trucks to either side of the girder assembly.

Power for the bridge track will travel from the split pit rail through the wheels to the wipers and then to the rail.

Trim and taper the ends of the two brass strips so that the ends fit between the axle braces. One strip will be used per truck. Curl the brass with your fingers so that when it is sitting on the truck it will make firm contact with the underside of the wheels. Solder a lead to the center of each strip, making certain that the brass is still touching each wheel. Glue wiper to the truck using CA. You may check that the wipers are making contact with the wheels by using a continuity tester. Tie the lead from the brass contact into the rest of your wiring for each truck. See Figure 26.
Final Bridge Assembly

Assemble the control cab by placing the base on a flat surface with the engraved “T” facing up. This will prevent you from building the cab backwards. Glue 4 walls in place using the tabs and slots as your guide. The taller windowed wall will be to the left of the “T” so that the roof of the cab slopes away from the track. The wall with the door should be at the bottom of the “T.” Use the roof insert inside the top of the cab to keep the walls square. Attach the roof with the engraved lines sloping from front to back. Attach railings in place using the tabs and nubs as your guide. See Figures 27 & 28.

![Figure 27](image1)

![Figure 28](image2)

Paint railings brown. One railing is shorter than the other to allow for placement of the control cab. Once dry, glue the railings in place with CA (since you will be making contact with 2 painted surfaces). The sides of the railing will abut the outside of the walkways, and nubs on the railings will make contact with the long deck ties. See Figure 29.

![Figure 29](image3)
Attach the control cab to the bridge. It should abut the short railing, walkway, and part of the top side of the deck. See Figure 30 & 31.

![Figure 30](image)

![Figure 31](image)

Assemble the arch and braces in the vertical position. The bottoms of all three pieces should be aligned and touching the table surface. See Figure 32.

![Figure 32](image)

Paint the arch brown. Once dry, glue to the center of the bridge. The design of the arch braces should allow the assembly to fit snugly around the deck pieces and against the outside of the railing. You may want to install a lamp under the arch and power it off of the bridge track. This will allow you to see if you have track power. See Figure 33.

![Figure 33](image)
Final Fittings

Install the bronze bushing in the center of the pit floor. It fits snugly and does not need to be glued in place.

Slide the metal turn block onto the brass tube and tighten the set screw. Do not over tighten, as this will deform the tube. Drop the brass tube into the bronze bushing in the center of your pit floor. See Figure 34.

The pit is completed and ready for the bridge and installation in your layout.

Place the bridge over the turn block. The wheels of the bridge should sit perfectly on the pit rail and the whole assembly should turn easily. Be sure that the bridge does not hit the pit wall anywhere and that the wheels stay on the rail. If the wheel axles slip out of the wheel support you may need to add a drop of CA to hold them in place. Be very careful not to get any CA on the wheel bearings themselves. See Figure 35.

If you are going to use the New York Railway Supply Indexing and Motor Kit, or the CMR Turntable Motor Kit you may want to consult their instructions for mounting the motor to the bottom of the pit. You will not use the bronze sleeve with the NYRS system and there are small holes in the pit floor that may be drilled out to mount the NYRS motor directly to the bottom of the pit.

Your turntable is finished and ready to install on your layout. We thank you for purchasing this kit from CMR and hope that you have enjoyed building it. Be sure to see our other kits at www.cmrtrain.com.
Turntable Pit Parts
Not to scale
105' turntable version shown

Pit Floor
0.125"

Pit Wall Flange (x4)
0.125"

Pit Wall (x24)
0.125"

Pit Wall Flange (x4)
0.060"

.125" Alignment Tube (x8)

Pit Tie
0.060"