Double Track Lift Bridge
5"W x 28.75"L x 13.5"H
Plus two 9" long approach bridges

Instructions for assembly of the Double Track Lift Bridge

Included in this kit:
Instructions and part diagrams
136ea. 1/16" laser cut loose parts
11ea. 1/16" laser cut parts sheets
4ea. 1/8" laser cut parts
1ea. 1/16" square rod
7ea 3/64" x 15" plastic coated wire

A vertical lift bridge has a span which rises vertically while remaining parallel with the track. The counterweights on a vertical lift bridge only have to be equal to the weight of the bridge, whereas on a bascule bridge counterweights must weigh several times more than the span being lifted. Therefore, heavier materials can be used on the deck of the lift bridge which makes it especially well suited for heavy railroad use.

Our bridge is based upon typical lift bridges found in the United States spanning the Mississippi and other major rivers. These were built from the early 1900’s on. Our model has a 115 foot long lift span and towers that rise 75 feet. The entire bridge is raised on concrete piers and has unique footings. In addition to the lift bridge, the kit includes two 65’ long girder bridges which may be used as approaches to the main bridge. This is a non operating model.

Please read these instructions completely before beginning and take your time to become familiar with the parts. Allow parts to dry after painting or gluing and do not try to build this in one night. This is a big bridge and it will take a little time to build. Drawings of all the parts have been included for ease of part identification.

In order to make the instructions and figures clear, some of the model assemblies have been painted gray prior to photographing. In some cases the model is gray and the newly added parts have been left white. This is only for illustration purposes. You should paint your model as indicated in the instructions.

Practice gluing the acrylic together if you have never done it before. There is plenty of scrap in your kit that you can use for this. See “Gluing Acrylic” for more information on this.

If by chance a part is missing or broken, please write 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: hobby knife, paint, paint brushes, glue, modeling putty, tweezers, files and sanding block.
**Gluing Acrylic**

Always glue acrylic in a well-ventilated area, and read the glue manufacturer’s label for instructions. We recommend using Tenax-7R by Hebco or Plastruct brand “Plastic Weld Solvent Cement” (PPC-2 or PPC-16) or “Bondine Solvent Cement” (Bond-2 or BOND-16). Tenax-7R comes with a dispenser and Plastruct sells a Solvent Syringe (HT-8 or HT-10) and various other solvent dispensers. Most hobby shops carry these products or they may be ordered directly from Hebco (931)-796-7442 or Plastruct (626)-912-7016.

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, accurately, 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.

**Preparing Your Model for Painting**

We recommend lightly sanding all parts to remove the raised edge created during the laser cutting process. In order to hide the seams we recommend using “hobbyist putty” such as Green Squadron modeling putty. Do this in a very well ventilated area. Apply the putty over the seams; allow to dry overnight. Once the putty has dried, place a sheet of fine sandpaper on a flat surface and sand smooth. You may need to apply a second coat of putty and sand again.

**Painting Your Model**

We primed our model with Krylon Gray Primer spray paint. We used Krylon Flat Black spray paint for the bridge. Krylon is available in most hardware stores. We also used “Polly Scale Acrylics” for details and weathering, these are available in most hobby shops. Always test compatibility of your paint with the acrylic by painting and testing a small area first.

We used Polly Scale Steam Power Black 414110 for touch up and weathering as well as the cables. The piers and counter weights were painted with Polly Scale Concrete 414317. Or you can use Polly Scale Aged Concrete 414320. The walkways and railings we painted brown with Polly Scale D&RGW Building Brown 414256. We used Polly Scale Rust 414323 for weathering.

Never use alcohol or alcohol-based cleansers, paints or washes on acrylic. It will cause it to “shatter” and this is bad.
**Bridge Truss Side Assembly**

There are two bridge truss assemblies; build one first and then the other.

Lay the interior truss side (1) flat on your work space. This is the truss side with the slots cut into it. There are small engraved rectangles on one side of the part that should be facing up.

Insert and glue two sets of the vertical support beams (3), (4), (5), (6) and (7) into the truss side (1). Use the tabs and slots to aid in position and alignment. See figure 1.

Glue two sets of the webbed truss braces (8), (9), (10), (11) and (12) to the truss side (1). Use the engraved lines on part (1) for alignment. See figure 2.

Glue the exterior truss side (2) to the assembly making sure that the side with the engraved rivets is facing up. See figure 3.

Next glue the truss top (13) and bottom (14) in place. See figure 3.

Note that the two vertical end beams, parts (3), on the truss assembly are slightly taller than the rest. The truss top (13) is shorter than the truss bottom (14). Glue the truss top between the end vertical support beams (3) so that it lays flat across the tops of the rest of the support beams. It should sit inside of the truss sides so that it is flush with the top of the truss sides.

The bottom part (14) is slightly longer and runs the entire length of the truss. Glue this in place.

Fill the seams along the top and bottom with green squadron modeling putty, allow to dry and sand or file flush. See figure 4.

Now build the other truss assembly.
**Bridge Base Assembly**

Glue the cross braces (16) x 10 onto the beam supports (15) x 4 using the slots for alignment. Make sure the assembly is square. See figure 5.

Glue the base top and bottom (17) x 2 onto the beam support assembly. Make sure that the tabs on the cross braces (16) stick out beyond the top. Test fit DO NOT GLUE the base assembly into the side truss assemblies in order to make sure that the tabs align with the slots. See figure 6.

**Bridge Assembly**

Glue the two side assemblies to the base assembly making sure that all the tabs are seated properly and that the assemblies are square to each other. Next glue two each of the top braces (18), (19), (20), (21), (22) between the side assemblies using the slots and tabs for alignment.

Glue the cable plates (62) x 2 (this is located on the hoist platform parts sheet) to the inside top edge of brace (18) on each end of the bridge. See figure 7.

Prime the bridge gray and paint it black.
**Tower Assembly**

The towers have side assemblies similar to the bridge except that they are not symmetrical. The sides will be built in mirrored facing pairs. As there are two towers you will need to build two pairs.

Place the truss side part (23) on your work table with the engraved side facing up. Glue part (27) into the slots along the angled side of part (23). Glue part (28) into the slots along the straight side of part (23). Glue truss brace parts (30), (31), (32) and (33) into the slots on the cross braces of part (23). Glue webbed truss brace parts (34), (35), (36) and (37) onto part (23) using the engraved lines as guides.

Glue part (24) on top of the assembly with the engraved rivets facing up. Glue the guide rail part (29) into the slots on the face of part (24) (this is the side with only one set of slots). See figure 8.

Repeat the process for the other side using parts (25) and (26). This will make a mirrored assembly to the first one. See figure 9.

Place the parts assembly (23), (24) so that the side with the slots is facing up. Glue part (38) into the slot at the top of the assembly. Glue part (39) onto the angled side of the side of the assembly, glue part (40) onto the straight side of the side assembly. Glue part (41) into the slot at the base of the assembly. See figure 10.

Glue the parts assembly (25), (26) to the other side to form a square tower. Make sure the assembly is square.
Attach the girders (42), (42A), (43A) and (43) to the bottom of the tower using the slots for alignment. Note the orientation of the engraved rivets on (42) and (43). They should be facing out. Insert the cross braces (44) x 2 and (45) x 2 in alternating order. See figure 11.

Glue the top of the bridge webbing (46) to the girders. Flip the assembly over and glue the bottom webbing (47) to the underside of the bridge. See figure 12.

Assemble the bridge foot by gluing parts (48) and (50) between two parts (49). See Figure 13.

Glue the bridge foot to the end of the bridge tower base. See figure 14.

Figure 15 shows the pair of towers completed. One has been primed while the other remains white.

Prime gray and paint the towers black.

Note: due to changes during the design process there are no parts (51) or (52).
**Hoist Platforms**

There are two hoist platforms that are identical and sit on top of the towers. The platforms have large wheels which are used to hoist the bridge up and down. The wheels have notches in them where wire (representing the cables) will eventually be glued in place. On the front the wires will connect to the bridge, and on the back the wires will travel down through the floor to the counterweights.

Glue the sides parts (53) x 2 and (54) x 2 to the platform base (55) to form a box. The engraved side of part (55) should be facing up. Part (55) may be curled due to the engraving. Use parts (54) to force and hold it flat. Sand the parts after they have dried to remove any glue damage. Install the railing (56) and (57) x 2 into the holes in the platform base. See figure 16.

Assemble the hoist wheels using four parts (58) and three parts (59). Stack the parts in alternating order beginning and ending with part (58). Use a piece of 1/16" square styrene rod as a shaft. Make sure that all of the wheel parts (59) are aligned in the same manner (notches line up). Glue all the parts together. When dry, cut the square shaft so that it extends 1/32” beyond the wheels. You will need two of these for each tower. See figure 17.

Glue the wheel braces (60) x 4 into the base. The side of the brace with the short bottom faces towards the front of the base (the side of the base without a railing). Glue the brace sides (61) x 4 to the outside of the braces flush with the base.

Glue the wheels between the braces so that the notches are facing down. The square rod should snap into the holes in the wheel braces. Later we will install wires (cables) from below and fit them into the notches in the wheels. Repeat for the other platform. See Figure 18.

Glue the platforms onto the top of the towers. The front of the hoist platform should face the straight side of the tower. See Figure 19.

Prime gray and paint black.
Counterweights

There are two counterweights to assemble. These are basically cubes. The top has holes that the cables will slide into.

Glue the fronts (62) x 2 and the sides (63) x 2 to the bottom (64). Glue the top (65) onto the assembly. Fill the edges with modelers putty and sand smooth using a sanding block. There should be no visible seams when completed. See figure 20.

Prime gray and paint concrete color.

Bridge Piers

There are two types of bridge piers. The large ones are for the front of the towers and the smaller ones are for the approach bridges. The parts are all tab and slot construction to help with alignment. The piers are basically cubes with a cap. You will need to build two of the large piers and four of the small piers. When finished fill all the seams with modeling putty and sand smooth prior to attaching the caps.

Large Piers: Glue the fronts (66) x 2 and the sides (67) x 2 to the inside support parts (68) x 2 to form a cube. After filling and sanding glue the cap part (69) on top of the pier. See figure 21.

Small Piers: Glue the fronts (70) x 2 and the sides (71) x 2 to the inside supports (72) x 2 to form a cube. After filling and sanding glue the cap part (73) on top of the pier. See figure 22.

Prime gray and paint concrete color.
Approach Bridges

Glue the cross braces (74) x 6 and (75) x 5 onto the beams (76) x 2 using the slots for alignment. The rivets on the beams should be facing out. Begin with a brace (74) on the end, then a (75) and so on, alternating every other one. You should end with a brace (74) on each end. Make sure the assembly is square.

Glue the top (77) and bottom (78) onto the beam assembly.

Assemble the bridge feet by gluing parts (48) and (50) between parts (49) as done previously. Glue a foot onto either end of the bridge. See figure 23.

Build two of the approach bridges.

Prime gray and paint black.

Bridge Guides

There are eight bridge guides to assemble. These are guides that keep the bridge on guide rails mounted on the towers. Begin by gluing part (80) onto part (79). Next stack part (81), (82) and another (81) onto the pin on part (79) and glue in place. See figure 24 for location and orientation of the parts.

Prime gray and paint black.
Final Bridge Assembly

At this point you should have all of the bridge components built. These include the lift bridge, two bridge towers, two approach bridges, two large piers, four small piers, two counterweights and eight bridge guides.

We will begin by installing the counterweights in the bridge towers. You will be putting six wires through six holes at the same time so some patience will be required.

Cut two of the 3/32" plastic coated wire into twelve equal pieces measuring 2.5". Sand off the rough ends of the wire so that they are slightly pointed.

Insert the 2.5" wires into the holes in the tops of the counter weights and drop them all the way to the bottom. This should leave 1.25" sticking up. Make sure that they are all parallel and square. Secure them in place with a drop of super glue. Double check they are still square and allow to dry. Once dry trim them flush if necessary and double check for burrs on the exposed ends of the wires. Paint the wires black. Weather the concrete counter weight at this point as they will soon become inaccessible. See figure 25.

Slide the counterweight up into the bridge tower, run the six wires through the six holes in the hoist platform. The wires should fit into the notches in the hoist wheels. Glue in place with super glue while holding the weight so that the wires hang parallel to the flat side of the tower. You may need a second set of hands for this.

Alternatively you may lay the tower on the straight side and insert the counterweight. You can add a shim or block under the weight so that the wires are parallel to the flat side. Then glue the wires in place to the hoist wheels. See Figure 26.

Repeat for the other tower.

Let dry completely. You may want to add some additional super glue to where the cables meet the wheels to ensure that the glue joint is strong.
Next you will mount the bridge between the towers. Glue the 1/8" acrylic bridge mounts (83) x 4 between the flanges of the “I” beams on the ends of the bridge. The bridge mounts will stick out 1/16" of an inch from the flanges. See Figure 27.

Next glue the towers to the bridge. The bridge mounts attached to and extending from the bridge will fit into the flanges on the towers. Assemble so that the floor of the bridge and the towers are perfectly flush and glue together. See Figure 28.

Cut the remaining six pieces of plastic coated wire into twelve lengths of 6". Sand the rough edges off of the ends of the wires. Paint the wires black. The wires mount into the notches on the front of the hoist wheels and into the holes on the top of the bridge cable plate (62). You may want to test fit them and trim to fit. Glue in place with super glue.

Install the bridge guides, there are two located on each side of the bridge top and bottom. Fit the guide over the guide rail (29) and glue in place. See Figure 28.

Place the lift bridge on the piers. The two large piers go under the tower. Two of the small piers go under the ends of the tower bridges. These will be shared by the approach bridges. The remaining two small piers go under the ends of the approach bridges. Of course your arrangement can vary to suit your needs.
Install bridge track (not included in this kit), we recommend using Micro Engineering bridge track. This is available from your local hobby shop or direct from Micro Engineering. Make sure it is centered on the bridge. You will need to super glue this to the bridge. You can use the walkways as a straight edge to push the track against in order to keep it straight.

Paint the walkways and railings to resemble wood. Install the walkways, as well as the railings along side of the track. The exact location of this will depend upon the width of the bridge track ties. Also install the ladders on the ends of the towers, they should be on the same side as the walkways.

You can weather your bridge with drips and runs of brown and rust, as well as an airbrushed over spray of gray to resemble chalking paint. Install the bridge on your layout and enjoy.
Lift Bridge Double Track
Shown 50% of Actual Size

Lift Bridge Railing

Lift Bridge Walkway
Ladder x 2
Holst Platforms
Double Track
2 sets
Approach Bridge Double Track
Shown 50% of Actual Size
2 sets

Railings
Walkway

| (74) x 6 |
| (74) |
| (75) x 4 |
| (75) |
| (76) |
| (76A) |
| (76A) |
| (76) |
| (78) |
| (83) x 4 |
| (83) |

| (49) |
| (49) |
| (49) |
| (49) |
| (49) |
| (50) |
| (50) |
Small Bridge Pier Double Track

Shown 50% of Actual Size

2 sets