Micro Engineering Company

ASSEMBLY INSTRUCTIONS
HO 100 FT. THRU GIRDER BRIDGE
#75-522, 75-523

Micro Engineering Co.
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GENERAL

One of the most common railroad bridges in use today is the Thru Girder Bridge. This bridge is found in many different sizes and variations throughout the U.S.A.

Variations of the Thru Girder Bridge can be made by modifying this kit or combining it with other Micro Engineering bridge kits. The square girder ends can easily be modified to rounded girder ends as found on many prototype thru girder bridges (see photo and step 1). A "concrete" trough is included in the kit so a ballasted deck bridge rather than an open deck can be built (see step 7). Since this model has square girder ends, any length bridge can be built by placing multiple spans end to end using a Bridge Support at each junction. Extra Bridge Supports are available, kit #80-175. This can be done with additional Thru Girder Bridge kits or by adding a deck girder bridge to one or both ends which is a common prototype practice. Some of these longer bridge versions are available in complete kits from Micro Engineering as are the Deck Girder Bridge kits.

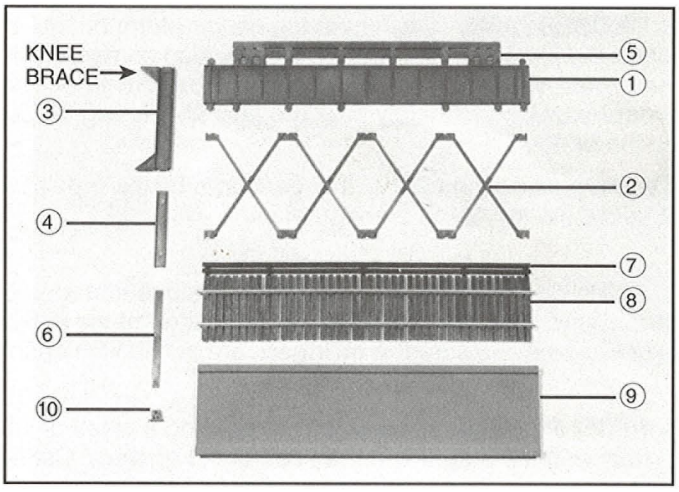
Most parts in this kit are made of injection molded styrene plastic and should be glued with a styrene solvent cement (such as Testors®). The Delrin® bridge track and the white metal bridge shoes should be glued with a rubber based cement (such as Pliobond®, available from Micro Engineering).

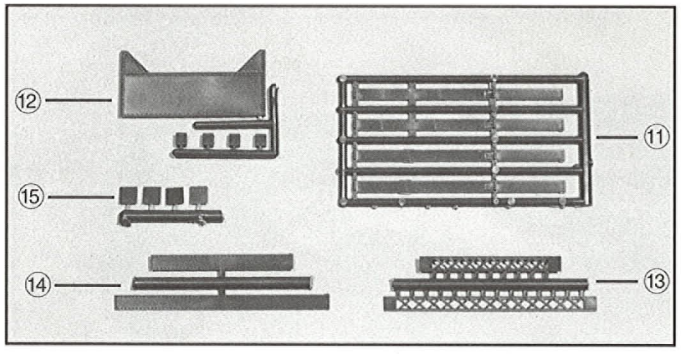
Read each instruction step completely before proceeding with that step. Refer to the photos for reference.

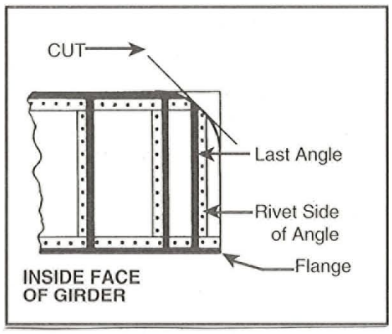
Before beginning assembly trim off or file any flash and gate marks from all plastic and white metal parts. File or sand the draft angle off the edges of the **crossbeams** ③ and **stringers** ④. The draft angle on the **girders** ① will be removed later.

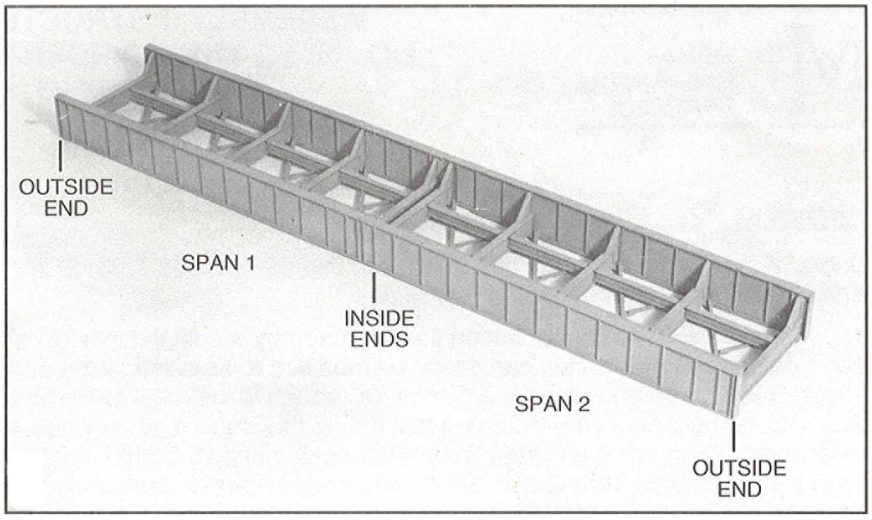
The following parts and the number needed to assemble your kit are listed below and keyed to the photos. Extra parts that will not be used may be included in your kit.

	Parts per Kit	
	#75-522	#75-523
① girders	4	6
② lateral bracing	2	4
③ crossbeams	10	20
④ stringers	16	32
⑤ long rivet plates	8	12
⑥ short rivet plates	8	12
⑦ guard timbers	4	8
⑧ bridge track	2	4
⑨ concrete trough	2	4
⑩ bridge shoes	4	6
⑪ leg halves	4	6
⑫ cross-girders	1	2
⑬ leg cross-bracing	4	6
⑭ leg rivet plates	4	6
⑮ bearing plates	4	6
rail joiners	2	4









ASSEMBLY - Single Track

1. GIRDERS There is an inside and outside face to each **girder** ①. The inside face is the face where the rivet side of the last angle is toward the end of the **girder** (see drawing). Orient both **girders** so the inside face is toward the interior of the bridge. In addition, the rivet side of the center angle of each **girde**r must be toward the same end. If necessary, turn one of the **girders** upside down (end over end) for correct orientation.

If you want to modify the **girders** to rounded end **girders** (see photos), cut the top corner off one end of each **girder,** with a razor saw, at a 45° angle as shown in the drawing. Then file the corner round to an approximate 5/16 inch radius. Use the drawing as a guide for cutting and filing. Be sure to cut the corner from the correct ends so the finished span will have square girder ends at one end and rounded girder ends at the other.

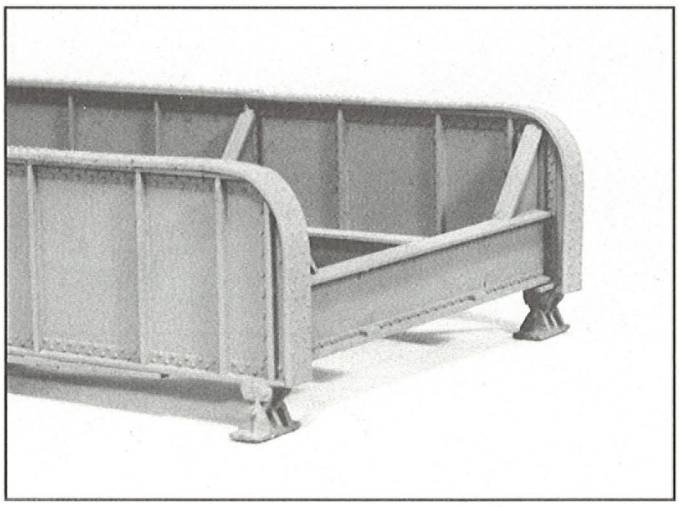
Place a **girder** on edge on your work surface and cement the **lateral bracing** ②, with the rivet detail down, to the bottom flange of the inside face of the **girder.** Cement the other side of the **lateral bracing** to the inside face of the second **girder.** Turn the bridge upside down and check that the plates on the **lateral bracing** are flat against the bottom flange of the **girders.** Adjust and re-cement, if necessary.

2. CROSSBEAMS Starting at the center of the bridge, place the **crossbeams** ③ across the bridge and cement to the top of the plates of the **lateral bracing,** also cementing the knee braces (see parts photo) against the girder face. Position the **crossbeams** so the knee braces are on the smooth side of the girder angles (not the rivet side). Install the **crossbeams** immediately after the **lateral bracing** before the cement has completely set. This makes it easier to square up the bridge.

If you are using rounded end girders, trim off the tops of the knee braces on the two end **crossbeams** so the knee braces fit below the top of the rounded ends.

3. STRINGERS Trim off the short extensions that are on one end of the **stringers** ④. Place the **stringers** between the **crossbeams** on the pads at the bottom edge of the **crossbeams.** Cement the **stringers** to the pads and the face of the **crossbeams.** Be sure the **stringers** are in line with each other and are parallel with the **girders.**

4. RIVET PLATES Place a bridge span on a piece of sandpaper on a flat surface and sand off the draft angle from the bottom and top edges and the ends of the **girders**. Center and cement a **long rivet plate** ⑤ to the bottom edge of each **girder**. Trim the last section (at the step) off each end of a **long rivet plate**. Center and cement this shortened **long rivet plate** to the top edge of each girder. The rivet plates are easily centered by lining up the rivet plates on the bottom edges with the crossbeams and on the top edges with the girder angles.

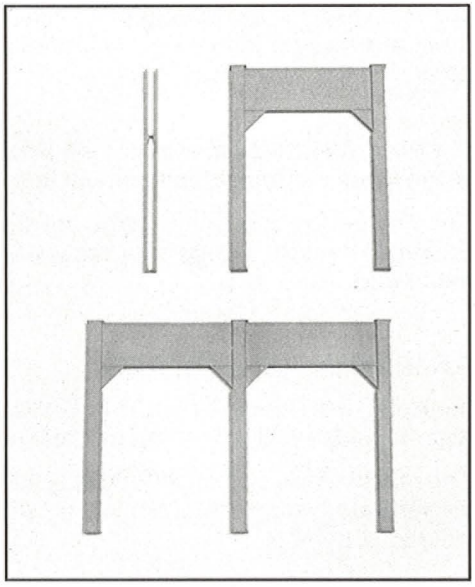


A. Square End Girders

Cut a section from each **short rivet plate** ⑥ long enough to fit the outside end (see photo) of each **girder** and cement in place. Rivet plates are not used on the inside ends of the **girders** (the end that joins the other span).

Cement the remaining portion of each **short rivet plate** to the areas on the top edge of each girder not covered by the **long rivet plate.** Butt these sections against the ends of the **long rivet plate** and extend them past the ends of the **girder**. Trim off the excess length.

B. Rounded End Girders



At the rounded end of each girder, cement a **short rivet plate** ⑥ to the area on the top edge of the **girder** not covered by the **long rivet plate**. Butt this section against the end of the **long rivet plate** and continue cementing it around the radius and down the end of the **girder**. The rivet plates can be bent more easily around the radius by applying the solvent cement to their underside which will soften the plastic. Trim off any excess rivet plate that extends below the bottom of the **girder**.

At the opposite end of each **girder**, cement a **short rivet plate** to the area on the top edge of the **girder** not covered by the **long rivet plate**. Buttt this section against the end of the **long rivet plate** and extend it past the end of the **girder**. Trim off the excess length. Rivet plates are not used on the inside ends of the **girders** (the end that joins the other span).

5. SPAN ASSEMBLY Build the second span by repeating steps 1-4. Place the two finished spans on a flat surface and cement them together end to end at the inside ends (the ends without rivet plates). Be sure the spans are perfectly aligned.

6. BRIDGE SUPPORT Place two **leg halves** ⑪ on edge and cement together at the two spacers (see photo). Build two leg assemblies for the single track kit or three leg assemblies for the double track kit.

Insert one end of a **cross-girder** ⑫ halfway into the first leg assembly and cement it to the support pad/spacer and to the **leg halves**. Insert the opposite end of the **cross-girder** halfway into the second leg assembly and cement in place. Be sure the **cross-girder** is square to the leg assemblies.

If building a double track kit, cement one end of the second **cross-girder** into the opposite side of either of the first two leg assemblies. Then cement the opposite end of the second **cross-girder** halfway into the third leg assembly.

You have your choice of finishing the legs with **leg cross-bracing** ⑬ or more modern looking **leg rivet plates** ⑭. Cement the short **leg cross-bracing** (or **leg rivet plates**) to the inside of the leg assemblies and the long **leg cross-bracing** to the outside of the leg assemblies. Be sure the cross-bracing is flat and seated properly on the leg edges.

Finish the bridge support by cementing the **bearing plates** ⑮ to the top and bottom of each leg. Do not cement the bridge support to the bridge at this time.

7. TRACK

A. Open Deck Bridge

Cut the **guard timbers** ⑦ off the **bridge track** ⑧. To enable the track to sit on the **stringers,** six ties must be removed from each piece of track where they interfere with the **crossbeams.** Start by cutting out the last tie at each end of the track. Then count nine ties in from each end and cut out both 10th ties. Count nine more ties and remove the 10th and 11th ties at the center of the track. This will leave four sections of nine ties. Evenly space the tie sections and individual ties on the rail. Care must be taken when cutting and spacing ties to avoid popping the remaining ties off the rail. Repeat for each piece of **bridge track**.

Trim the **guard timbers** to length so they match the overall tie length of the **bridge track** and cement them on each side of the track, to the top of the ties, flush with the tie ends, bolt head detail up.

Attach two pieces of **bridge track** together using the **rail joiners**. Check the track for proper fit on the bridge but do not cement to the bridge at this time.

B. Ballasted Deck Bridge

With a ballasted deck bridge, regular track is laid and ballasted through the **concrete trough** ⑨ so the special **bridge track** is not used. Center the **concrete troughs** end to end, and upside down on the bridge and mark the location of the knee braces on the bottom of the trough. With the edge of a large file, file a slot at each mark, across the bottom corner, at approximately the same angle as the knee braces. File the slots until they are deep enough to allow the trough to sit on the **crossbeams.** Check the troughs for proper fit on the bridge but do not cement to the bridge at this time.

8. PAINTING If you plan to paint your bridge, paint and weather the bridge spans, the bridge support, and the bridge track **or** concrete trough before further assembly. Thru girder bridges are most commonly painted a flat black or silver color.

9. FINAL ASSEMBLY Center the **bridge track** on the bridge and cement to the **stringers** or center the **concrete troughs** on the bridge and cement to the **crossbeams**.

With the bridge assembly upside down, cement the **bridge shoes** ⑩ to the bottom of the **girders** at each end of the bridge. Center the bridge support where the spans join and cement to the girders. Be sure the bridge support is square to the bridge.

ASSEMBLY – Double Track

If building the Double Track Thru Girder kit, assemble a single track bridge as described in steps 1-3. Then assemble the second bridge half to the first half following steps 1-3 except for the following changes:

The outside face of the center girder will be facing the inside of the second bridge half. As a result, the two end slots on the **lateral bracing** ② will not line up with the last angle at each end of the **girder.** Trim off the outside portion of these slots for a good fit.

The end of the two end **crossbeams** ③ also will not line up with the last angles of the center girder. Just cement these **crossbeams** inside the last angle, in line with the **crossbeams** on the first bridge half.

Continue with step 4.