

# Scratchbuilding a 1/72 Scale B-5 Maintenance Stand

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Photo courtesy of Omega Aviation <http://omegaaviation.com/index.html>

The B-5 stand was the companion to the B-4 stand. It was designed back in the 50's to reach higher points on the aircraft so the base is nearly three times as tall as the B-4 stand base. It was a rugged and versatile tool and many are still in use today.

As with the B-4 stands, I built this stand as part of my B-52D diorama. It was not a main objective so its construction and detail is not necessarily complete or totally accurate. However, I did make every effort to build the stand as close to scale as possible with the information I had.

If you find any errors in or have any suggestions concerning this document, please email me at [striker8241@yahoo.com](mailto:striker8241@yahoo.com).

## Terminology

Many of the descriptive terms used for the various parts in these instructions were assigned by me in the absence of finding the correct term.

## Measurements in this Document

I used metric measurements throughout this document because I find them much easier to work with. The following are the metric conversions I used for this scale:

25.4 mm = 1 in = 72 scale inches (sin) = 6 scale feet (sft)

4.2 mm = 1 scale foot (1 sft)

0.35 mm = 1 scale inch (1 sin)

All measurements are rounded to the nearest 0.5 mm

Drawings are not to scale except where noted.

## Materials you will Need

0.5 mm/.020 in. rod (Plastruct # 90851)

0.9 mm/.035 in. rod (Plastruct # 90854)

0.2-0.3 mm/.008-.012 in. sheet plastic (I used clear 0.25 mm/.010 in. PETG plastic sheet but thin card stock will also work)

0.5 mm/.020 in. sheet plastic (Plastruct # 91102)

mm round stock (you could also use the 0.9 mm rod)

1.5 mm round stock (sprue or commercial equivalent)

2 mm round stock (sprue or commercial equivalent)

strainer mesh (0.5 mm openings or smaller)

0.5 mm/.020 in. diameter soft wire or equivalent material

## Painting your B-5 Stand

In the 60s, especially for stateside units, maintenance stands and ground equipment were almost always painted a bright yellow color (FS 13538) to make them more visible on the flightline. Here are some representative paints courtesy of TarnShip on the FSM forums [http://cs.finescale.com/fsm/modeling\\_subjects/f/19/t/147816.aspx](http://cs.finescale.com/fsm/modeling_subjects/f/19/t/147816.aspx)

1707 Gloss Yellow Enamel

1708 Flat Insignia Yellow Enamel

4683 Gloss Yellow Acrylic

4721 Flat Insignia Yellow Acrylic

The hydraulic actuator and line, and the hand pump were usually a gray color when new or recently replaced but were eventually painted the same yellow as the stand. The rubber bumper around the bottom of the platform was normally black when new but frequently was painted the same yellow.

The tow ring was painted a red color, possibly FS 11120 (OSHA Red), but any safety-type red color, gloss or flat, will do.

## Description

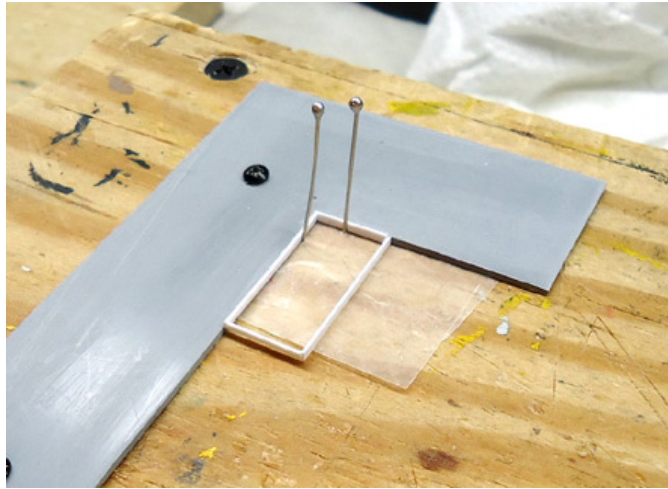
My B-5 stand model consists of three major assemblies: the Platform Assembly, the Lift Assembly, and the Base Assembly. The platform assembly provided the workspace for the technicians. The lift assembly provided the means to raise and lower the platform assembly. The base assembly provided a stable yet mobile support structure for the platform and lift assemblies.



## Constructing the Platform and Base Frames

Both the platform and the base assemblies are built around the same size frame so we will begin construction with the frames. Both frames are rectangular and are made from 0.5 mm styrene sheet cut into 1.5 mm strips.

- 1) Cut 4 end pieces 1.5 mm x 13 mm long and 4 side pieces 1.5 mm x 27 mm long to make two frames.
- 2) Assemble the two frames with the end pieces capping the side pieces. Be sure the corners are square. **NOTE:** I put a strip of waxed paper under my parts to keep the glue from sticking to the work surface.



## Building the Platform Assembly

The Platform Assembly consists of a frame, the platform grid, three sets of hand rails, and a hydraulic hand pump to raise and lower the platform.

### Constructing the Platform Grid

The actual surface where the technicians stood was an open metal grid. The open grid construction allowed rain and snow to drain away and provided a safe non-slip work surface. The actual grid had raised bumps that provided even better traction in icy conditions.

I replicated the grid (without the bumps) using the mesh from a fine metal strainer that I bought at a local store. Look for the finest (smallest size) mesh available. Below is a picture of the type of strainer I bought.



You will need a pair of tin snips or strong scissors to separate the mesh from the holder.

- 1) Cut the mesh away from the holder. **DO NOT** flatten the mesh hemisphere as this can dislodge or distort the individual metal threads. Cut out sections as you need them and then flatten them.
- 2) For the platform grid, cut out a square about 50 x 50 mm and carefully flatten it. Some of the strands on the ends or sides may come loose but that's ok.



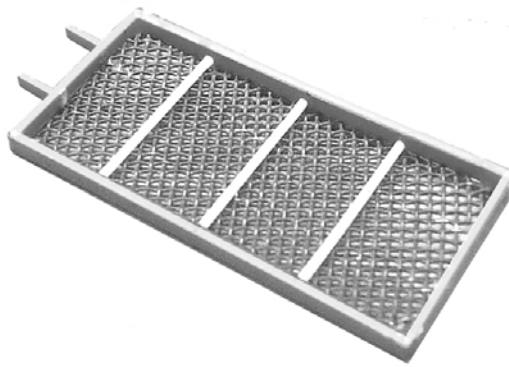
- 3) At this point, I recommend you coat the mesh thinly with superglue or you can use a hard acrylic or enamel paint. This will keep the weave from coming apart when you cut it to its final shape.
- 4) Be careful not to spray too much paint at one time or use too much glue as this can clog the openings in the mesh.

## Attaching the Grid to the Platform Frame

- 1) Once the grid material is thoroughly dry, lay it on a flat surface.
- 2) Place either of the two frames you built on the mesh so the pattern of openings is at a 45 degree angle to the sides of the frame.
- 3) Carefully mark a fine line on the mesh along the inside of the frame, then cut out the grid.
- 4) Lay the frame on a flat surface and place the grid rectangle inside it. Be sure the grid is all the way to the bottom and as flat as possible.
- 5) Glue the grid to the inside of the frame. Use glue sparingly to avoid clogging the openings of the grid around the edges.
- 6) Allow the assembly to dry thoroughly. When you turn the frame over, the grid will be even with what is now the top of the platform frame, as shown below.



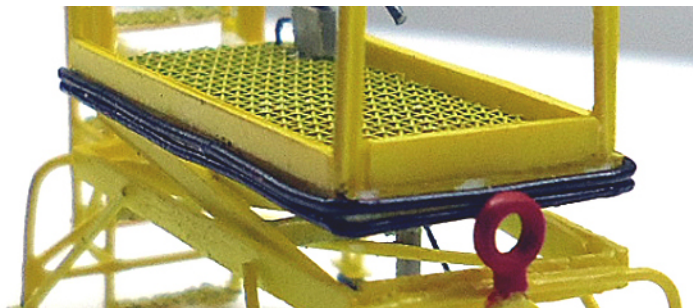
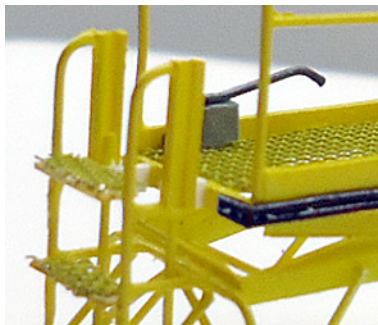
- 7) Locate the center point of one end of the platform frame and lightly mark a point 3 mm out on both sides.
- 8) Cut two pieces of 0.5 mm sheet stock to 1 mm x 1.5 mm in size for the connecting rod plates.
- 9) Glue the plates to the end of the frame where marked. The plates should be parallel with the sides of the frame as shown above.
- 10) The next step is to add some 0.5 mm grid supports. You can use round or square stock. I used Plastruct round rod #90851.
- 11) Cut 3 pieces 12 mm long.
- 12) Turn the frame over and position the three supports evenly across the bottom of the grid as shown below (about 6.5 mm spacing), then glue them to the sides of the frame.
- 13) Once the assembly is dry, it is ready for painting. **NOTE:** When painting the platform, use multiple passes of light spray to avoid clogging the gaps in the mesh.



## Attaching the Bumper

The "B-series" stands had a bumper that was basically two rubber tubes bonded together and wrapped around the platform frame to prevent damage to the aircraft. I used two pieces of 1 mm diameter copper wire (including insulation) painted black for my bumper.

- 1) Turn the frame over so the grid is on the top.
- 2) Start at the end of the frame with the two connecting plates.
- 3) Glue the first piece of wire to the top of the frame about 3 mm from the corner, as shown below.

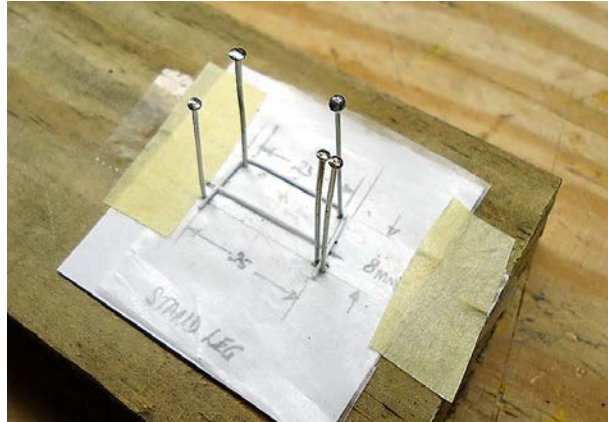


- 4) Hold the wire tightly against the frame as you bend it around the first corner, then tack it to the frame in several places on the side and end.
- 5) Bend the wire around the second corner and lay it tight against the opposite side.
- 6) Bend the wire around the end and cut it off about 3 mm from the side.
- 7) Glue the wire in place on the end then glue the wire to the frame along the side.

- 8) Allow the glue to dry and then repeat the procedure for the second bumper. You may need to touch up the paint on the bumpers.

## Building and Attaching the Hand Rails

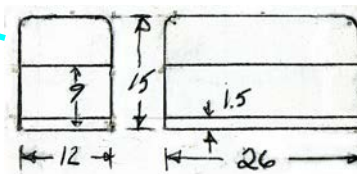
You will need to make some simple jigs to form the hand rails. I used individual wooden blocks for each jig as shown in the example below. I made the drawings to scale then attached them to the blocks with scotch tape. I then covered the drawings with a layer of wax paper to protect them from the glue.



You can make a forming jig for the side and end hand rails from the scale drawing below. Simply print out this page and cut out the drawing to make your jig.

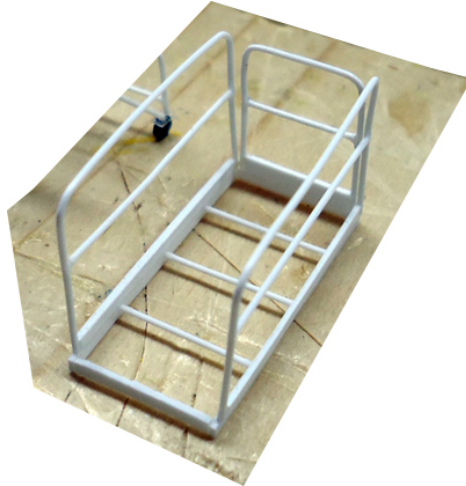
END RAIL

SIDE RAIL



- 1) When you're ready to begin construction, Start with the side rails. These are made from 0.5 mm rod. You will need to make two of these.
- 2) Place pins at each of the bend points and along the sides of the rail to hold it straight.
- 3) Then cut a section of rod longer than that required for the rail - about 60 mm.
- 4) Lay one end of the rod between the side rail pins so that the end protrudes beyond the bottom of the drawing at least 3-4 mm and carefully bend the rod around the first pin to form a right angle. You will need to bend the plastic tighter than the bend in the rail to force it to remain at a right angle. Go slowly and bend the plastic a little at a time to avoid breaking it. Place pins along the top to hold the rod straight.
- 5) Bend the rod around the second pin until it remains straight and hold it in place with pins on the outside.
- 6) Cut a piece of rod 26 mm long for the middle brace, then glue the brace in position as shown in the drawing.
- 7) Cut a piece of 1 mm styrene to 1.5 x 26 mm for the bottom piece and glue in place. **NOTE:** On the real stands, this bottom piece was welded to the platform with tubular receptacles at each end and the handrails were inserted into them. It was just easier to build this way.

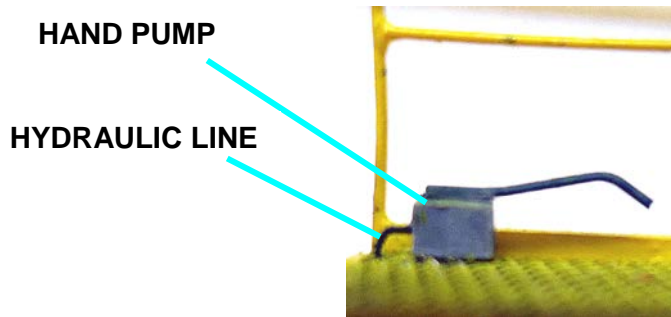
- 8) Once the side rails are done, you need to build the end rail. Use the end rail jig to build the end rail.
- 9) Allow the rails to dry thoroughly and then paint them. Once the paint is dry, scrape some paint off the bottom of the rails and glue them to the platform, as shown below (**NOTE:** Your model will already have the platform grid installed and be painted).



## Building the Hand Pump

The actual platform was raised by operating a small hydraulic hand pump that was mounted to the platform on the left side as you climbed the ladder. The pump consisted of a body and a handle, and was connected to the hydraulic actuator on the lift assembly by a hydraulic line.

Most pumps were gray or black in color when the stand was new or a new pump was installed but they usually got painted yellow when the stand was repainted. The handles were gray or silver depending on the type of tubing used. Again, they were often repainted yellow. I painted my pump assembly gray so it stands out better.



- 1) To make the pump body, cut a 1 mm thick piece of sheet styrene into a 2 mm x 3 mm rectangle.
- 2) Make the handle from a 0.5 mm piece of styrene rod 9 mm long. The actual handles were made from metal tubing and were sometimes straight or bent as shown above - either shape is ok.
- 3) Glue one end of the handle to a long side of the pump body and paint as desired.



- 4) For the hydraulic line, I used a single strand from a piece of 22-gauge stranded copper wire. Cut your line about 15 mm long and make a small right angle bend in one end.
- 5) Trim the bent section to about 2 mm long.
- 6) Paint the wire black or dark gray.
- 7) Drill a small hole in the end of the pump opposite the long handle and insert and glue the bent section to the pump.
- 8) Thread the other end of the line down through the platform grid as shown above and glue the pump to the platform as shown below.

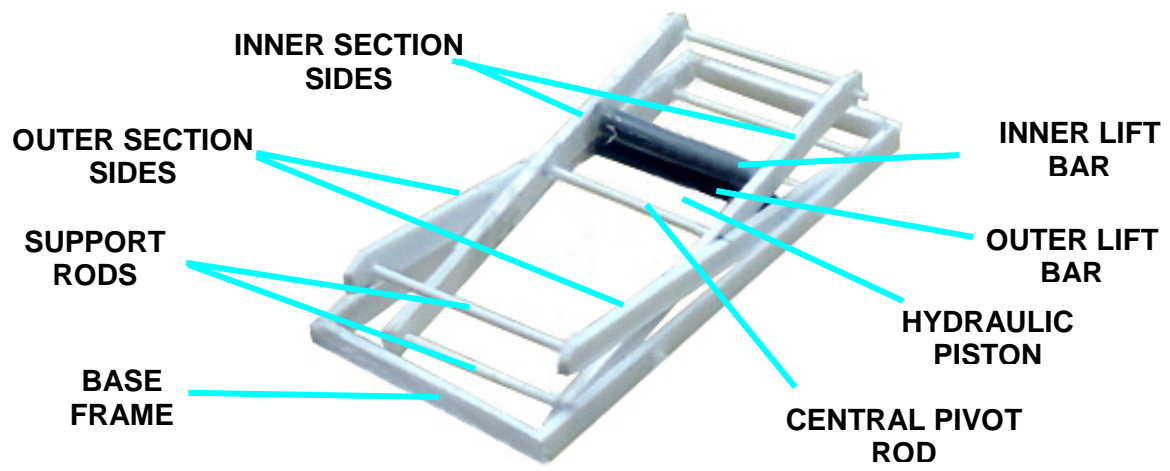


This completes the construction of the platform assembly. The other end of the hydraulic line will be connected during final assembly of the stand.

## Building the Lift Assembly

The Lift Assembly consists of a scissors mechanism and a hydraulic actuator. The lift assembly is one of the most inaccurate parts of the model. Most of the pictures I could find were at extreme angles and it was very difficult to get accurate measurements. I finally left off several braces because it was just too difficult to determine how they were attached.

The scissors mechanism consists of two sections that I'll call "inner" and "outer". The inner section fits within the outer section and the whole mechanism is attached to the base frame, as shown below. A hydraulic cylinder is attached to the outer lift bar and its piston is attached to the inner lift bar.



On a real B-5 stand, the upper end of the inner section and the lower end of the outer section are pinned at the ladder end of the stand. The upper end of the outer section and the lower end of the inner section ride in slots in the platform and base frames. The two scissor sections are tied together by the central pivot rod in the middle. When the hand pump is operated, the hydraulic piston forces the two lift bars apart (the lever) and the upper ends of the two sections are forced toward each other by the pivot bar (the fulcrum) which raises the platform.

The scissors mechanism in my model is not functional and must be glued into position once the amount of extension is determined.

## Constructing the Scissors Mechanism

At this point, you need to determine how high you want the platform to be above ground. This height needs to be measured to the top of the platform frame. Once you have this measurement, you can determine the maximum extension of the lift mechanism.

Keep in mind the platform will only extend about 15-20 mm, so the maximum height above ground is about 58 mm. I have not built a model fully extended so I don't know how well the design will work at that height.

The height of the base frame will be about 28 mm above the ground so subtract 28 mm from the desired height of the platform. This will give you the separation between the platform frame and the base frame, which will determine how far the lift mechanism needs to be extended.

Record this measurement. You will use it when you assemble the scissors mechanism.

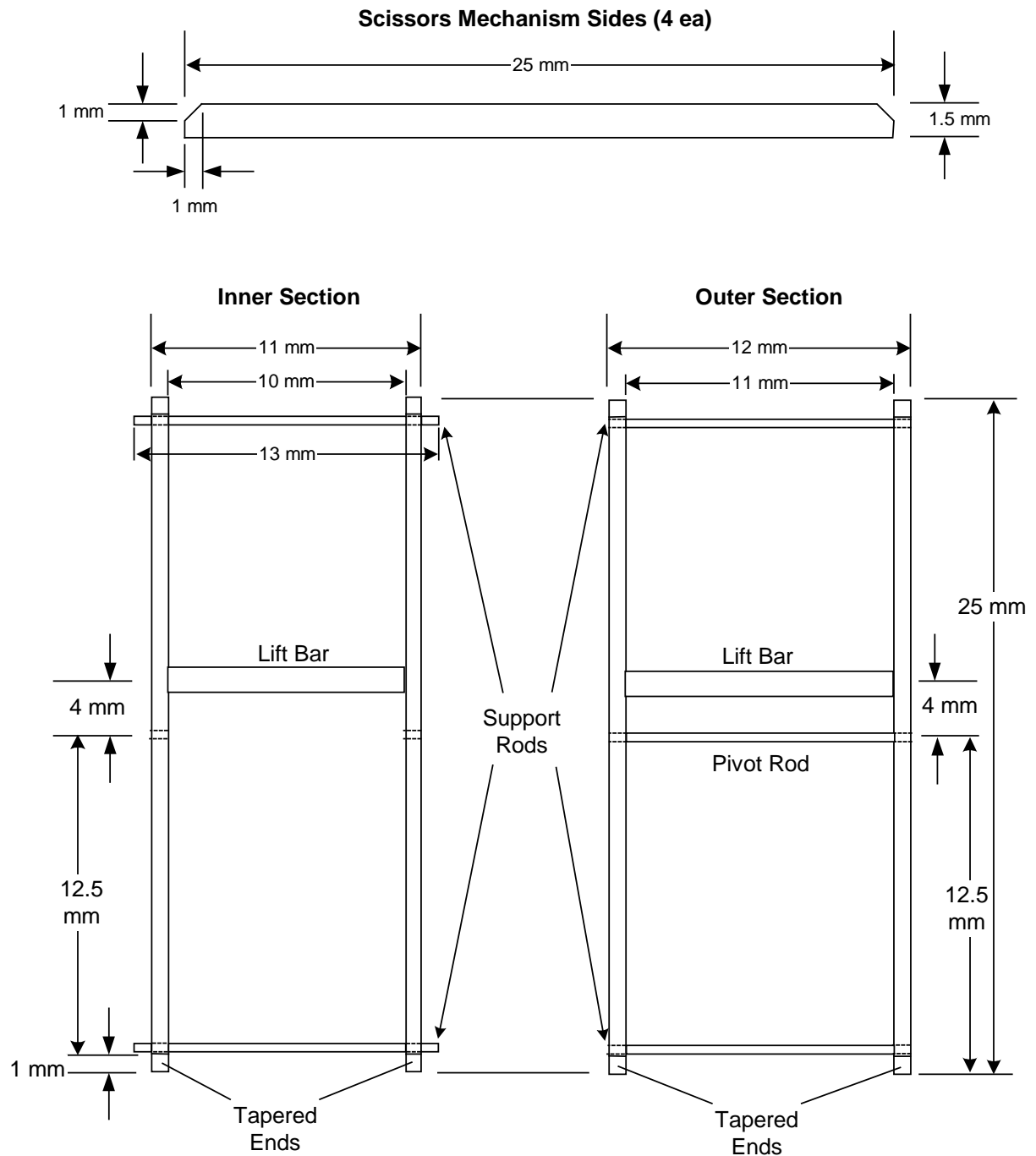
**AMOUNT OF  
EXTENSION**



Photo courtesy of Omega Aviation <http://omegaaviation.com/index.html>

The drawing below provides the dimensions for the scissors mechanism.

Cut out 4 sides using 1.5 mm styrene sheet or strips. Taper the tops of all four ends as illustrated.



## **Inner Section**

- 1) Using 0.5 mm rod, cut two support rods 13 mm long.
- 2) Drill holes for the support rods just inside of the tapered sections at the ends of the side pieces, as shown above.
- 3) Insert the support rods, leaving 1 mm extending past each side on all four corners.
- 4) Glue the support rods to the side pieces.
- 5) Mark the center points of the two sides (12.5 mm from the ends).
- 6) Drill holes in both sides at the center points to accept a 0.5 mm rod.
- 7) Measure 4 mm from the center points in the same direction on both sides and make a mark for the inner lift bar.
- 8) Construct the lift bar using 2 mm diameter round stock (I used sprue again) cut to 10 mm in length.
- 9) Glue the inner lift bar to the sides at the 4 mm marks.

## **Outer Section**

- 1) Using 0.5 mm rod, cut two support rods 12 mm long.
- 2) Drill holes for the support rods just inside of the tapered sections at the ends of the side pieces, as shown above.
- 3) Glue the support rods to the side pieces.
- 4) Mark the center points of the two sides (12.5 mm from the ends).
- 5) Measure 4 mm from these center points in the same direction on both sides and make a mark for the outer lift bar.
- 6) Construct the lift bar using 2 mm diameter round stock cut to 11 mm in length.
- 7) Glue the outer lift bar to the sides at the 4 mm mark.
- 8) Cut a 12 mm piece of 0.5 mm rod for the pivot bar.

## **Assembling the Scissors Mechanism**

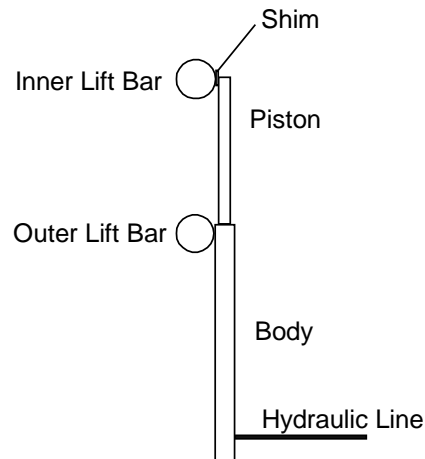
- 1) With the tapered ends of both sections facing up, insert the inner section through the outer section to form an "X" and line up the center holes.
- 2) Insert the pivot rod through both the inner and outer sections. Make sure no part of the pivot rod extends beyond the outer section on either side.
- 3) Lay the assembly on its side with the tapered ends pointing away from you and the lift bars to the right of center.
- 4) Select the left ends of the two sections and gently pull them apart until the separation between the ends equals the measurement you recorded earlier based on your desired height of the platform.
- 5) Verify the separation is the same for the right ends of the sections.
- 6) Glue the two sections together at the center points.



- 7) When thoroughly dry, paint the scissors mechanism.

## Building and Attaching the Hydraulic Actuator

The body of the hydraulic actuator is a cylinder that attaches to the outer lift bar while its piston attaches to the inner lift bar, as shown below.



- 1) Make the actuator body from 1.5 mm diameter round stock and cut it to a length of 8 mm.
- 2) Drill a hole about 1 mm from one end the actuator to accept the hydraulic line you attached to the hand pump during the building of the platform assembly (you will not attach the line yet).
- 3) The piston is made from 1 mm round stock. Determine its length by measuring the separation between the inner and outer lift bars then cut a piece to the measured length.
- 4) If you plan to spray paint the actuator parts, do so now. The actuator body was gray or black when new but usually ended up painted yellow with the rest of the stand. The piston should be painted a silver color.
- 5) When dry, attach the actuator body to the outer lift bar as shown above on the side toward the pivot bar.
- 6) Measure the distance from the top of the actuator body to the outside curve of the inner lift bar.
- 7) Fashion the hydraulic piston from 1 mm diameter round stock and cut it to the length determined in Step 6.
- 8) Glue the piston between the actuator body and the inner lift bar. **NOTE:** You may need to add a small shim between the piston and the inner lift bar to keep the piston straight relative to the actuator body.

**NOTE:** The hydraulic line will be attached to the actuator during final assembly.

This completes construction of the lift assembly.

# Building the Base Assembly

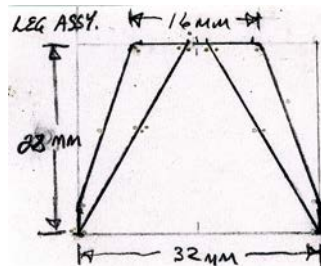
The Base Assembly consists of the base frame, two leg assemblies, various supports, the ladder assembly and the tow bar assembly.

**NOTE:** The ends of some braces on the real stands were flattened at attachment points. I wasn't concerned with that level of detail so my model does not include flattened ends. If you are working in a larger scale, study pictures of real B-5 stands to determine the correct shapes at attachment points.

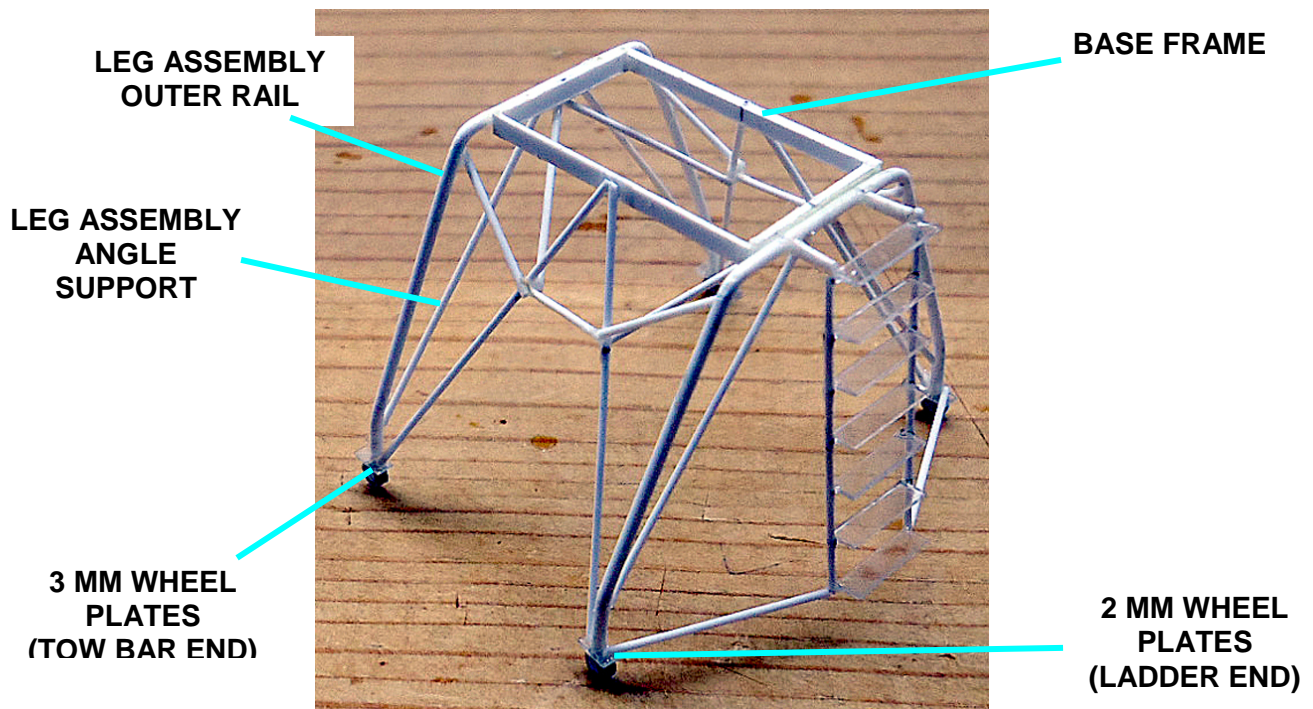
## Constructing and Attaching the Leg Assemblies

The leg assemblies consist of an outer rail, two angle supports, wheel plates and wheels.

You will need to make a jig to form the leg assemblies. Print out this page and cut out the drawing below to make your jig.



- 1) Build two leg assemblies using the drawing above. The outer rail should be made of 0.9 mm/.035 in. rod. The angle supports are made of 0.5 mm/.020 in. rod.
- 2) Allow both assemblies to dry.
- 3) Glue the leg assemblies to the ends of the base frame (the second frame you made), centering the top of the legs on the frame ends both horizontally and vertically, as shown below. Make sure the legs are at right angles to the frame. **NOTE:** The model in the photos below is more complete than yours will be at this stage.
- 4) Using thin sheet plastic 0.2 - 0.3 mm in thickness, make two wheel plates 1.5 mm x 2 mm, and two wheel plates 1.5 mm x 3 mm (I used clear 0.25 mm/.010 in. PETG plastic sheet but you could also use thin card stock).
- 5) Center the 2 mm wheel plates on one leg assembly (this will now be the **ladder end**) with the long sides of the plates parallel to the sides of the frame and glue in place (see picture below).
- 6) Repeat Step 5 with the 3 mm plates on the other leg assembly - now the **tow bar end**. Allow the plates to thoroughly dry.
- 7) Use a piece of 2 mm round stock and cut off four 1 mm thick slices to form the wheels.
- 8) Glue each wheel to the bottom of the wheel plates.
- 9) Paint the wheels black or dark gray.

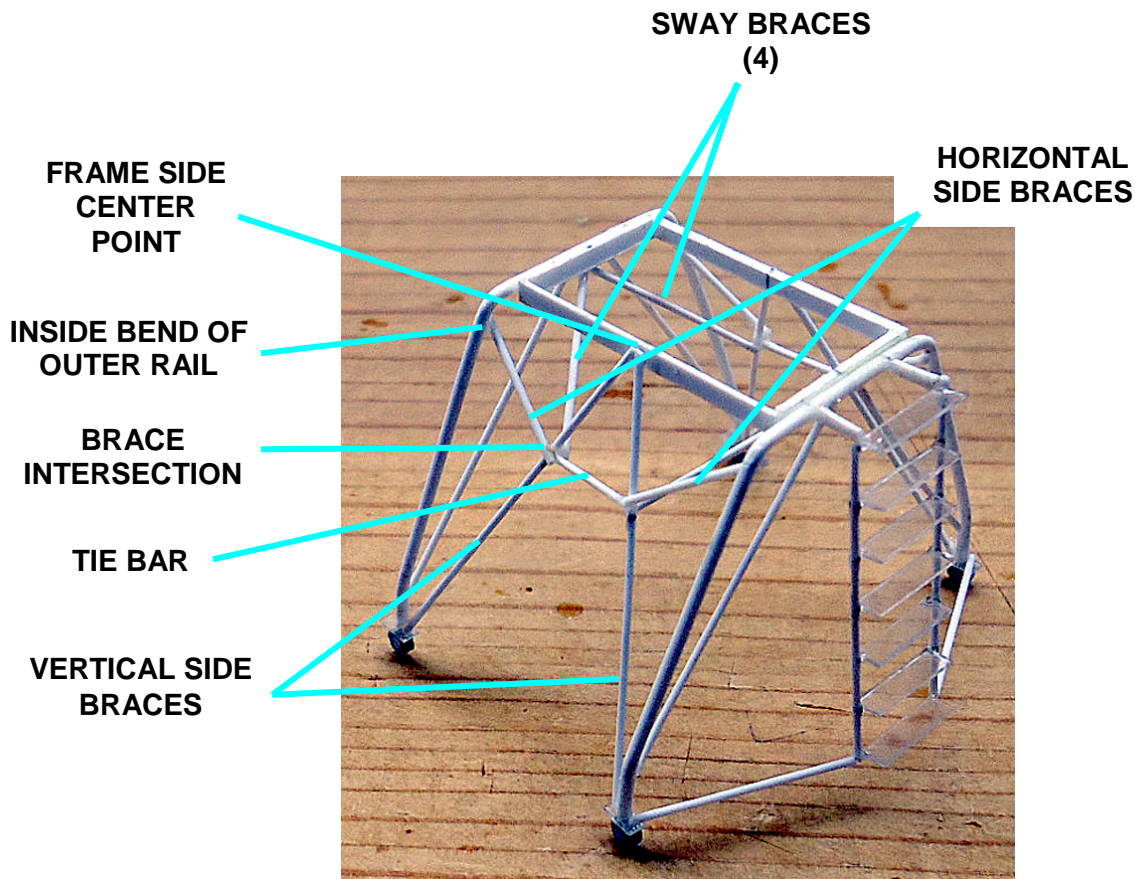


## Attaching the Braces

The B-5 stand had numerous vertical and horizontal braces to prevent the stand from swaying when troops were standing on it, and the legs from stuttering when it was being towed (because of the small wheels).

**NOTE:** The model in the photo below is more complete than yours will be at this stage.

- 1) Locate and mark the outside center of both sides of the frame.
- 2) Cut 4 pieces of 0.5 mm rod to a length of 30 mm to form the vertical side braces.
- 3) Glue one end of a brace to the wheel plate at each end and to the center point on the side of the frame as shown below. Trim the braces as needed to fit.
- 4) Cut 4 pieces of 0.5 mm rod to a length of 10 mm for the horizontal side braces.
- 5) At a point just below one of the top bends on the inside of the tow bar end outer rail, glue one end of the brace to the rail.
- 6) Glue the other end to the outside of the nearest vertical side brace, as shown below.
- 7) On the same side of the base assembly, at the same point on the ladder end outer rail, glue one end of a horizontal side brace to the rail and the other end to the other vertical side brace.
- 8) Measure the distance between the intersecting points of the two horizontal side braces and the two vertical side braces and cut a piece of 0.5 mm rod for the tie bar.
- 9) Glue the tie bar between the two intersecting points as shown.
- 10) Cut 4 pieces of 0.5 mm rod 14 mm in length for the sway braces.
- 11) Starting at either frame end, glue one sway brace from the underside center of the frame to the inside of a brace intersection.



## Constructing the Ladder Assembly

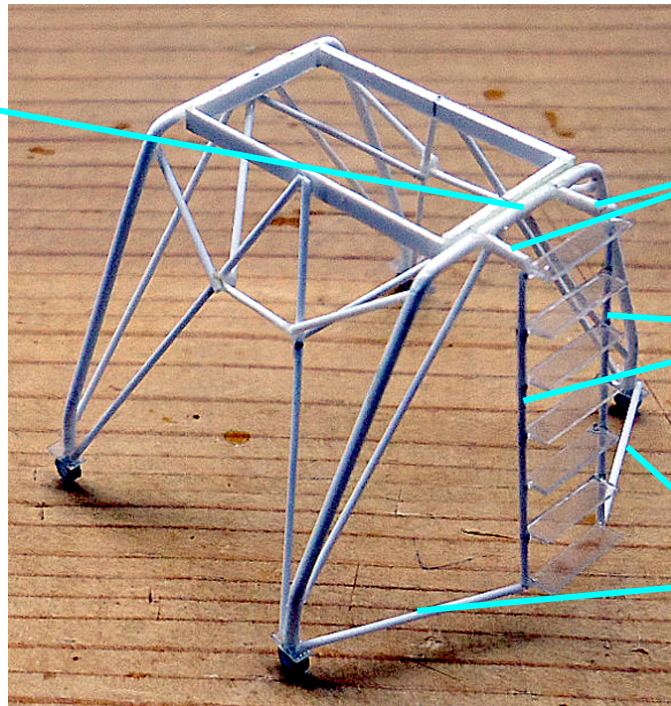
The ladder assembly consists of various step supports and braces, 7 outer steps, a movable inner step assembly and the handrails. **NOTE:** The models in the following examples are more complete than your model will be at this stage.

### Adding the Ladder Supports and Braces

- 1) On the ladder end leg assembly, mark the center of the outer rail (center of the frame end) , as shown below.
- 2) Measure 5 mm from the center mark to either side on the outer rail, then make a mark.
- 3) Cut 2 pieces of 0.9 mm rod to a length of 4 mm for the outer step upper supports.
- 4) Glue the supports at the two marked points as indicated above. Ensure they are horizontally parallel with the base frame.
- 5) Cut 2 pieces of 0.5 mm rod 24 mm in length for the outer step side rods.
- 6) Glue one end of each side rod vertically to the inside end of an outer step upper support.
- 7) Cut 2 pieces of 0.5 mm rod 16 mm in length for the outer step lower supports.
- 8) Glue each lower support between a wheel plate and the bottom end of the nearest outer step side rod. **NOTE:** Do not worry if the rods are not exactly vertical - a brace will be installed next that will help ensure the rods are vertical.



**LEG  
ASSEMBLY  
OUTER RAIL  
CENTER POINT**



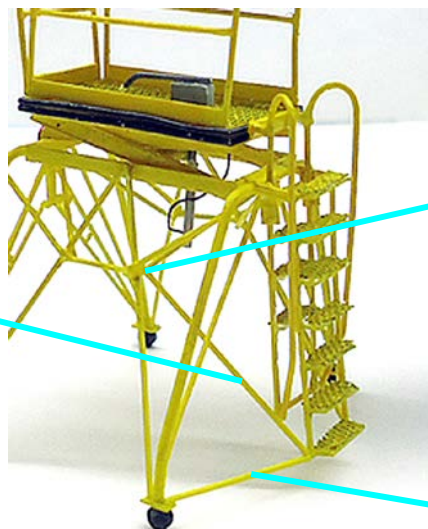
**OUTER STEP  
UPPER  
SUPPORTS**

**OUTER STEP  
SIDE RODS**

**OUTER STEP  
LOWER  
SUPPORTS**

- 9) Cut 2 pieces of 0.5 mm rod 24 mm in length for the ladder braces.
- 10) Glue one end of a brace to the inside junction of a vertical side brace and inner sway brace as shown below (**NOTE:** The model in this picture is more complete than your model at this stage).
- 11) Glue the other end to the junction of the outer step lower support side rod, ensuring the side rod is vertical. Trim the ladder brace if necessary.
- 12) Repeat Steps 10 and 11 for the other ladder brace.
- 13) Allow the base assembly to dry thoroughly, then paint it.

**LADDER  
BRACE**



**VERTICAL SIDE  
BRACE AND  
INNER SWAY  
BRACE  
JUNCTION**

**OUTER STEP  
LOWER  
SUPPORT**



## Constructing the Outer Steps

- 1) Cut out a square about 15 mm on a side and carefully flatten it. Some of the strands on the come loose but that's ok.
- 2) Orient the square so the openings will be at a 45 degree angle to the sides of the steps.
- 3) At this point, I recommend you coat the mesh thinly with superglue or spray on a hard acrylic or enamel paint. This will keep the weave from coming apart when you cut it to its final shape. Be careful not to spray too much paint at one time or use too much glue as this can clog the openings in the mesh.
- 4) If not already painted, paint the mesh material the color of the stand.

**NOTE:** The steps on the real B-5 stand were made of the same open-grid material as the work platform. However, cutting the metal mesh to the necessary small size for the steps, especially the inner steps, may result in pieces of the mesh coming loose even after painting or gluing. Further handling at this point could result in the step crumbling. To prevent this, I cut pieces of 0.25 mm/.010 in. clear PETG stock the same length and slightly smaller in width than the steps. After I painted the mesh steps, I glued them to the clear plastic. Once the steps are installed on the model, the clear plastic supports are virtually invisible.

- 5) Carefully cut out 7 rectangular pieces of the mesh material 2.5 mm wide x 8 mm long. You may need to touch up the paint along the cuts.
- 6) If you want to support your steps with clear material, cut four pieces 2.5 mm x 8 mm long. If not, go on to Step 8.
- 7) Center each mesh step on a clear support and glue them together.
- 8) Set the outer steps aside - you will install them during final assembly.

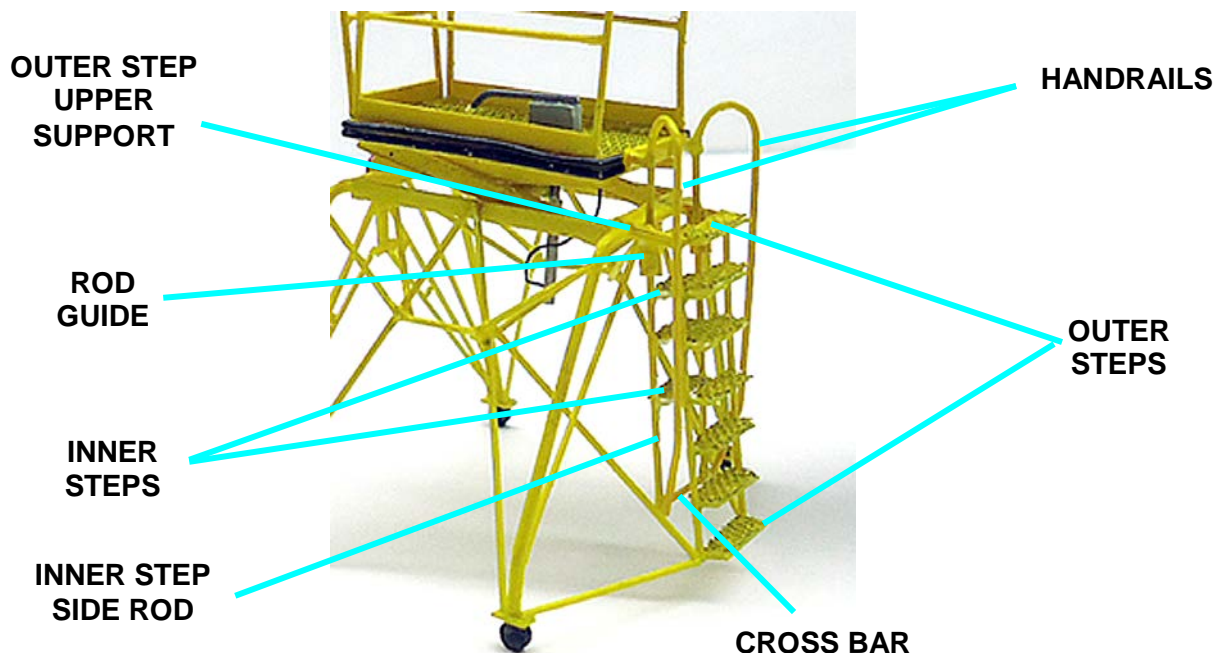
## Building the Inner Step Assembly

The top of the inner step assembly was attached to the connecting rod plates on the platform. When the platform was raised, the inner steps moved up to provide additional steps between the base and the platform for a total of 11 steps when the platform was fully extended. The handrails were attached to the vertical side rods and moved up and down with the inner step assembly.

The inner step assembly consists of two vertical rods, four steps, a cross bar at the bottom and two handrails. The vertical rods move up and down through two rod guide pieces which will be attached to the upper ladder supports.

- 1) Cut four 2 mm x 7 mm pieces of mesh material for the inner steps. You may want to clamp the material while you cut each edge separately to keep from loosening the weave.
- 2) Paint the steps the same color as the stand.
- 3) Cut 2 pieces of 0.5 mm rod to 22 mm for the inner step side rods.
- 4) From 1 mm sheet stock, make 2 guide pieces 1.5 x 5 mm (I made my guides from 1.6 mm I-beam stock (Plastruct #90511) or you could use channel stock (Plastruct #90041)).
- 5) If you use sheet plastic for the guide pieces, cut/file a shallow 0.5 mm groove down the center of each piece to accommodate one of the inner step rods.
- 6) Cut 1 piece of 0.5 mm rod to a length of 7 mm for the bottom cross bar.

- 7) Paint the rods, tie bar and rod guides the color of the stand.
- 8) When thoroughly dry, lay the two rods side by side on a flat surface and glue the cross bar between two ends. Ensure the assembly is square.
- 9) If you want to support your steps with clear supports, cut four pieces of the clear material 1.5 x 7 mm. If not, go on to Step 11.
- 10) Center the mesh steps on the clear supports and glue together.
- 11) Measure 7 mm up from the cross bar and make a mark on each rod for the first step.
- 12) Glue a step between the two marks, centering the rods on the sides of the steps.
- 13) When the glue is dry, attach the remaining three steps above the first step, spacing them 4 mm apart.
- 14) Glue the rod guides to the insides of the outer step upper supports and against the frame with the grooves facing each other. The tops of the guides should be flush with the tops of the supports as shown below.



- 15) Use the drawing below in a jig to form the 2 handrails.

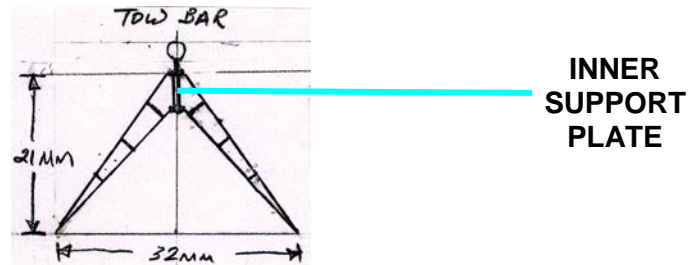


- 16) Paint the handrails the color of the stand.
- 17) Set the inner step assembly and handrails aside - you will install them during final assembly.

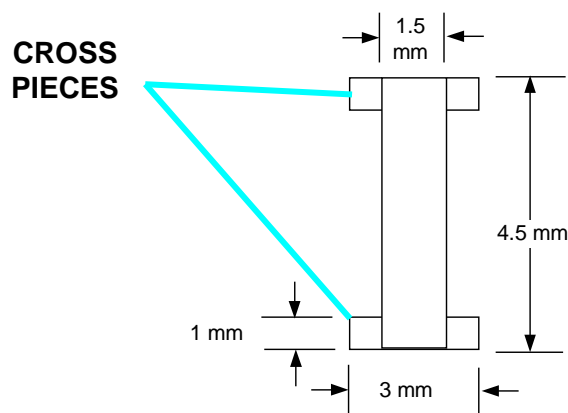
## Constructing the Tow Bar

The tow bar consists of a frame and a tow ring assembly.

The drawing below can be used as a jig for forming the tow bar frame.



- 1) Using 0.5 mm pieces of sheet styrene or card stock, construct the inner support plate as shown in the diagram below.



- 2) Assemble the tow bar using 0.5 mm diameter rod for the frame.
- 3) Attach the upper and lower rails to the inner support frame cross pieces.
- 4) Paint the tow bar assembly to match the stand.
- 5) Obtain a tow bar ring and shank, either from your spares box or by making one. My tow bar ring was taken from a trailer in the Hasegawa US Weapons Loading Set.
- 6) You can make a ring by cutting out a 3 mm diameter piece of 1 mm thick sheet styrene or cutting off a slice of round stock about 3 mm in diameter and then drilling out the center, then shaping and sanding the ring.
- 7) Cut a 1 mm piece of round stock 1 mm long for a shank and glue it to the ring as shown below.
- 8) Glue the ring to the top of the tow bar inner support plate.
- 9) Paint the tow bar ring red. The finished tow bar is shown below.



10) Set the tow bar aside. You will install it during final assembly.

## Final Assembly

You should have the following parts and assemblies completed before you begin the final assembly:

- Platform Assembly
- Scissors Mechanism
- Base Assembly
- 7 Outer Steps
- Inner Step Assembly
- Tow Bar Assembly
- 2 Handrails

### Attaching the Scissors Mechanism to the Platform and Base Assemblies

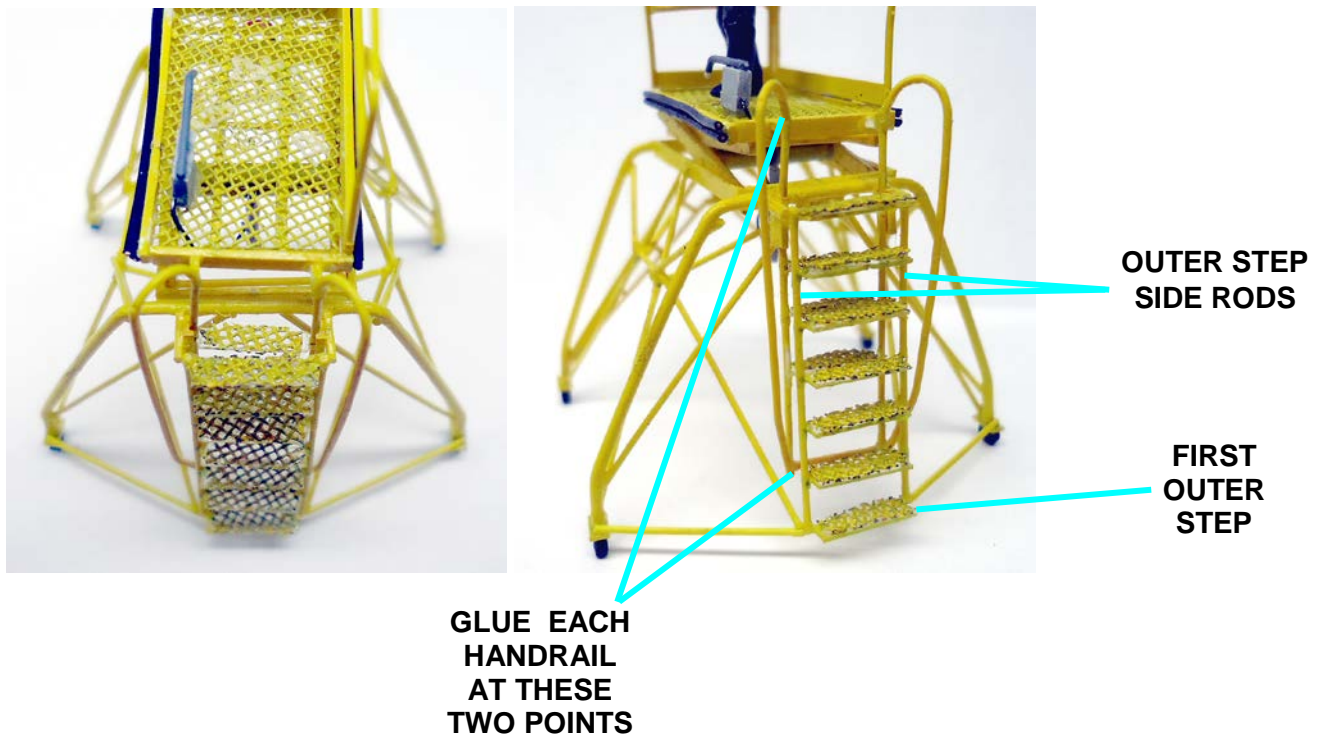
- 1) Line up the upper ends of the scissors mechanism with the bottom of the platform assembly. The lift bars on the scissors mechanism should be toward the ladder end of the platform.
- 2) Thread the hydraulic line through the scissors mechanism (location is not critical) and insert the end into the hole drilled in the hydraulic actuator body, then glue in place.
- 3) Glue the scissors mechanism inside the platform frame, ensuring the sides of the scissors mechanism are perpendicular to the bottom of the platform.
- 4) Insert the scissors mechanism into the base frame and align the upper assemblies so they are level with the base.
- 5) Glue the bottom of the scissors mechanism to the base frame.
- 6) Allow the entire assembly to dry before proceeding.

## Installing the Inner Step Assembly

- 1) From the bottom of the model , insert the inner step assembly rods into the rod guide grooves.
- 2) Move the step assembly up until the tops of the rods are even with the tops of the ends of the platform connecting rod plates.
- 3) Make sure the inner step assembly is square with the base of the stand (trim the rods if necessary) then glue the rod ends to the ends of the connecting rod plates, keeping them even with the tops of the plates.

## Installing the Outer Steps and the Handrails

- 1) Attach the back of the first step to the bottom of the outer step side rods as shown below.
- 2) Attach the remaining 6 steps at 4 mm intervals as shown.
- 3) Glue the handrails to the inner step assembly at the angle shown below. The top of the curved rail should be glued to the top of the corresponding inner step side rail. The bottom of the handrail is glued to the junction of the inner step side rail and the bottom cross bar.



## Installing the Tow Bar

- 1) Turn the tow bar so the inner support cross pieces are toward the stand.
- 2) Glue the two ends to the wheel plates and the back of the safety ring shank to the outer bar of the leg assembly.
- 3) If you want to show the stand being towed, lower the tow bar to the height of the tow tractor ring and glue the tow bar in place on the wheel plates.



**Congratulations! You just completed a very difficult build!**  
**I hope you enjoy your model!**

