

Building a 1/72 Scale Bomb Clip Transporter

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Overview

This manual describes my process for building a 1/72 scale model of the transporter used to carry pre-loaded "Big Belly" bomb clips to the B-52 bombers. The Big Belly modification was done to the D-model aircraft to enable them to carry considerably more iron bombs that was possible with the original nuclear-configured aircraft.

Each fully loaded 500-lb bomb clip weighed over 7 tons and was towed to the aircraft on a specially built transporter trailer as shown below.



Photo courtesy 306th Bomb Wing @ www.306thbw.org

Figure 1. Actual Bomb Clip Transporter



Figure 2. Model of the Transporter



Photo courtesy @ <http://billfields.tripod.com/utapao>

Figure 3. Munitions Loading Facility

The bomb clips were designed to be pre-loaded at a munitions facility similar to the one shown above at Utapao, Thailand. Once the clip was loaded with bombs, the transporter was maneuvered under it and the clip lowered onto a cradle on the trailer. In the image above, note the clip in the foreground ready to be loaded onto its transporter and the already loaded transporter in the far left background.

Terminology Used in this Manual

Many of the terms used in this manual were assigned by me in the absence of finding the correct term. They are used for reference purposes only.

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:

$$25.4 \text{ mm} = 1 \text{ in} = 72 \text{ scale inches (sin)} = 6 \text{ scale feet (sft)}$$

$$4.2 \text{ mm} = 1 \text{ scale foot (1 sft)}$$

$$0.35 \text{ mm} = 1 \text{ scale inch (1 sin)}$$

All measurements are in mm unless otherwise indicated.

All measurements are rounded to the nearest 0.5 mm.

Drawings are not to scale except where noted.

Materials You Will Need

The following is a list of materials I used on my model:

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

1.0 mm/.040 in. sheet plastic (Evergreen #9040)

2 mm round stock (sprue or commercial equivalent)

18 gauge wire or 1.0 mm/040 in. metal rod

1.6 mm/.062 in. ABS Channel (Plastruct #90041)

10 mm dia. wheels (set of 12) - You can purchase a complete set of the correct wheels at <http://www.shapeways.com/shops/modetail> for about \$16 USD.

Painting Your Transporter

Most USAF ground equipment such as power units, tow tractors, trailers etc. during the Cold War and Vietnam eras were painted yellow to make them more visible on the flightline.

The cradle, transporter body and undercarriage were painted yellow. The official FS standard for yellow ground support equipment was FS 13538, but FS 13591 and FS 33538 are close. You could use any of these for your transporter. Here are some representative Model Master paints for the FS 13538 standard, courtesy of TarnShip on the FSM forums:

1707 Gloss Yellow Enamel

1708 Flat Insignia Yellow Enamel

4683 Gloss Yellow Acrylic

4721 Flat Insignia Yellow Acrylic

Since I don't have a spray painting setup, I used Krylon Fusion Sunbeam/Safety Yellow gloss spray paint that I purchased at Ace Hardware (the Fusion series paints are designed to stick to plastic), followed by a coat of Testors Dullcote.

The tires were painted flat black. The tow bar ring and rear hook were painted red.

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Step 1 - Build the Bomb Clip Cradle

The "cradle" was a metal frame that supported the bomb clip panels and held the loaded bomb clip in place on the transporter. Once the clip was loaded with bombs, it was lowered onto the cradle (see Figure 4) and secured to the transporter with chains and turnbuckles. An empty transporter was rarely seen without a cradle in place.

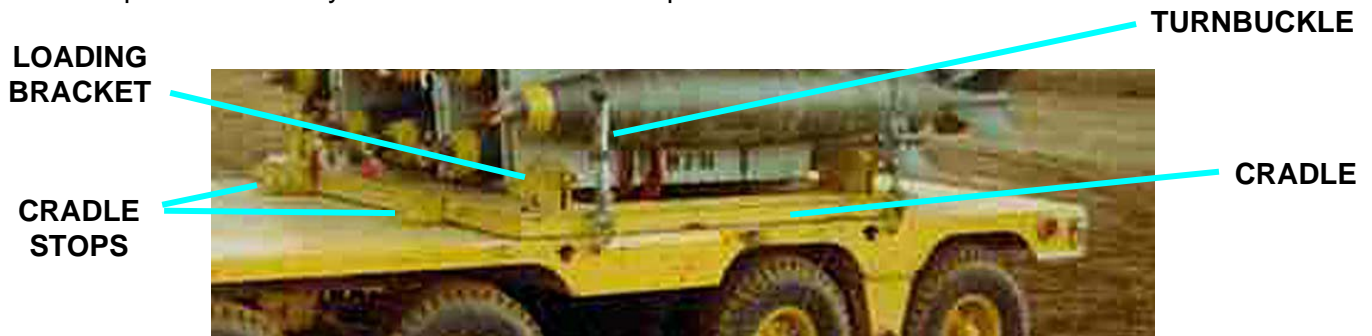


Photo courtesy 306th Bomb Wing @ www.306thbw.org

Figure 4. Actual Bomb Clip Cradle

Figure 5 shows the bomb clip cradle components and dimensions.

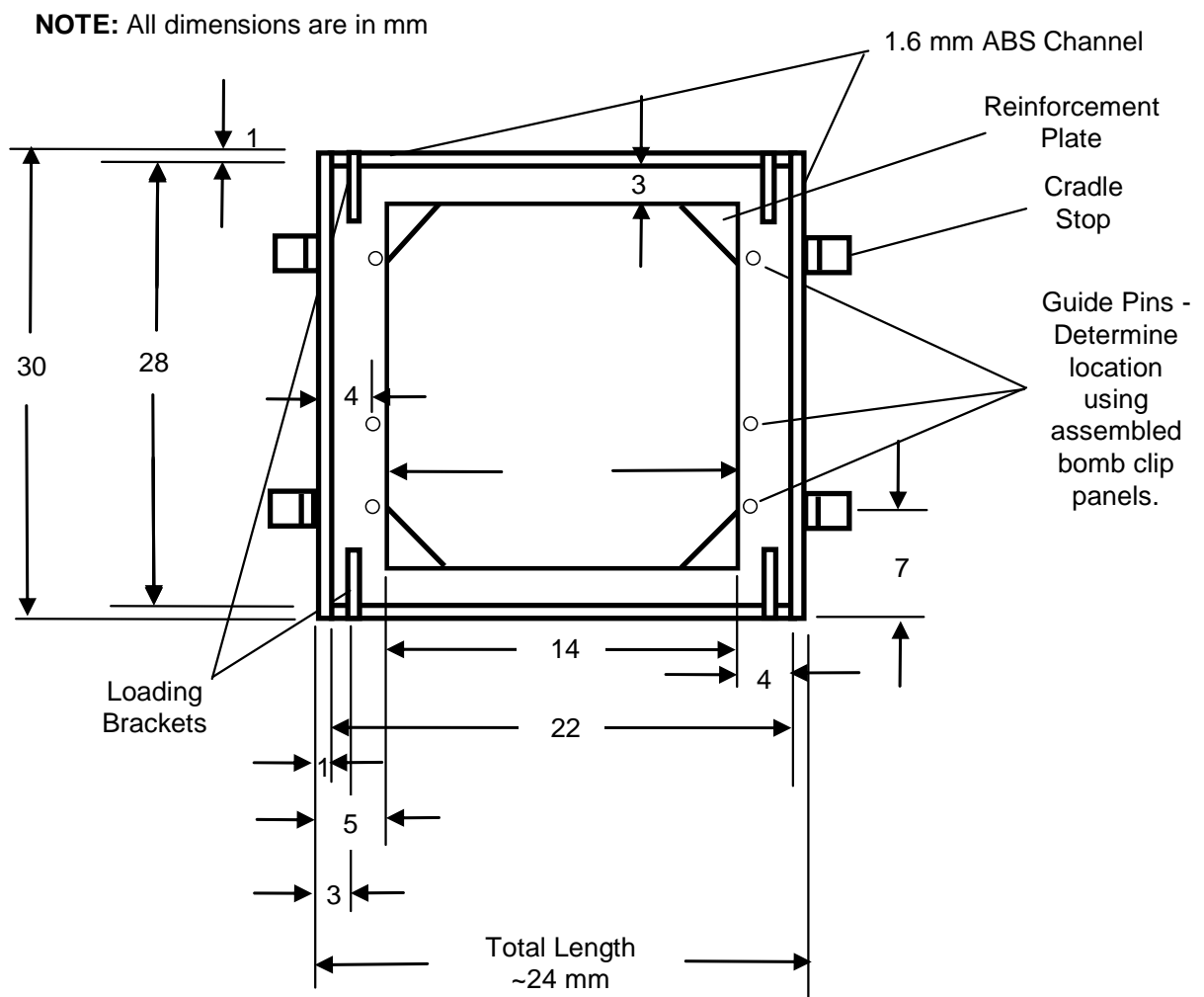
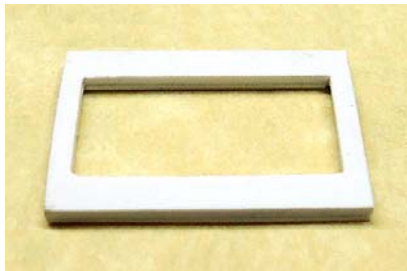


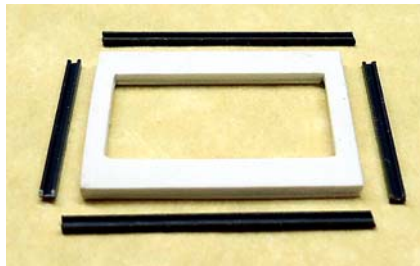
Figure 5. Cradle Dimensions

The cradle frame is made from one piece of 1 mm styrene and one piece of 0.5 mm styrene sandwiched together. This was necessary because the channel I used for the edges around the cradle is 1.6 mm wide.

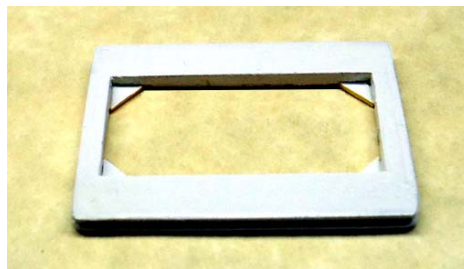
- 1) Cut out one piece of 1 mm styrene and one piece of 0.5 mm styrene to the dimensions 28 mm x 22 mm.
- 2) On both long edges of either piece, measure inwards 4 mm and make a mark at both ends.
- 3) On both short edges, measure inwards 1.5 mm and make a mark at both ends.
- 4) Draw lines between the marks to define an inside rectangle.
- 5) Cut out the inside rectangle on one piece and use it to mark the other piece.
- 6) Cut out the inside rectangle on the second piece.
- 7) Glue the two open rectangles together to form the cradle frame, then trim and smooth the inner and outer sides, as shown below.



- 8) Cut two pieces of ABS channel 22 mm long and two pieces 30 mm long.



- 9) Glue the 22 mm pieces to the short sides of the frame then glue the 30 mm pieces to the long sides. The ends of the 30 mm pieces will overlap the ends of the 22 mm pieces.
- 10) Trim and smooth the ends of the 30 mm pieces to match the ends of the 22 mm pieces.
- 11) From 0.5 mm plastic, cut two 3 mm square pieces, then cut each square diagonally to form 4 right triangles. These will represent the four triangular reinforcement plates that strengthened the inside of the cradle.
- 12) Glue each triangle, with the long side (hypotenuse) out, into a corner flush with the bottom of the cradle frame, as shown below.



Step 2 - Add the Loading Brackets

There were small bracket assemblies at each corner of the cradle (I call them loading brackets) that were used during preloading and possibly when loading the clip into the aircraft.



**LOADING
BRACKETS**

**GUIDE
PINS**

Photo courtesy James O'Rear @ www.jamesorear.com

Figure 6. Cradle Loading Brackets

The brackets proved to be too small to model in detail so I just added small pieces of plastic shaped to represent them. The dimensions I used are given in Figure 7 and the installed brackets are shown in Figure 8. You can get as detailed with these as you wish.

NOTE: All dimensions are in mm

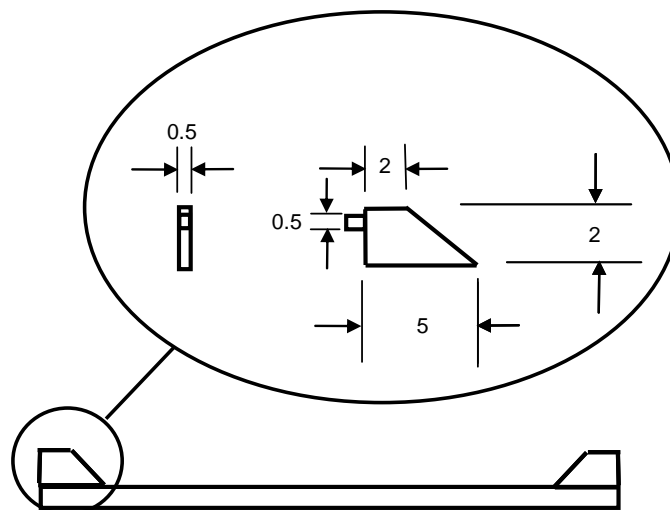


Figure 7. Loading Bracket Dimensions

- 1) Cut four pieces of 0.5 mm plastic to the dimensions shown in Figure 7.
- 2) Cut four pieces of plastic 0.5 mm square and 1 mm long. Glue one to each bracket as shown above.
- 3) Measure 3 mm back from each long edge of the cradle and glue a bracket in position as shown in Figure 8.

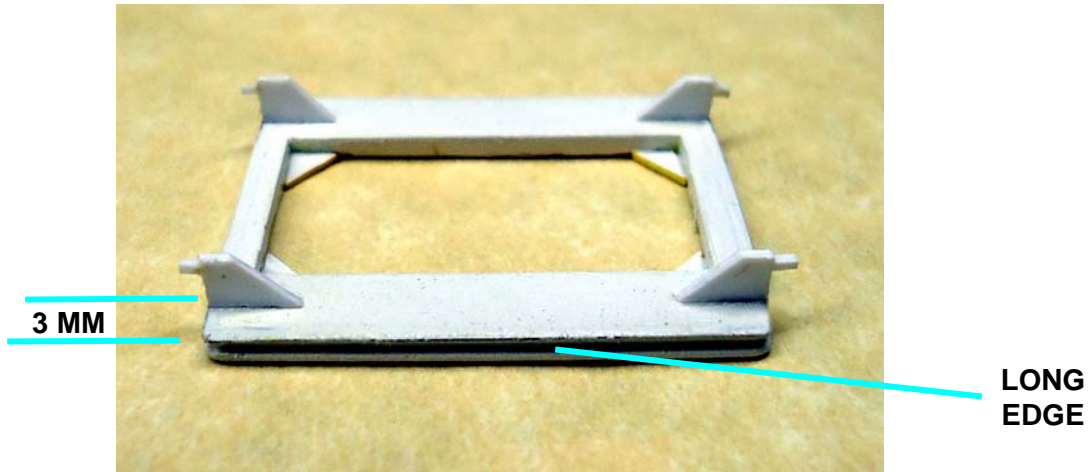


Figure 8. Cradle Ready for Painting

- 4) Paint the finished cradle yellow to match your chosen transporter color.
- 5) Set the cradle aside for now.

Step 3 - (Optional) Add the Cradle Guide Pins

Each cradle had 6 guide pins installed to keep the bomb clip panels from shifting during transport. The pins fitted into holes in the bottoms of the panels at each end and were located on the cradle approximately as shown in Figure 5 and Figure 9.

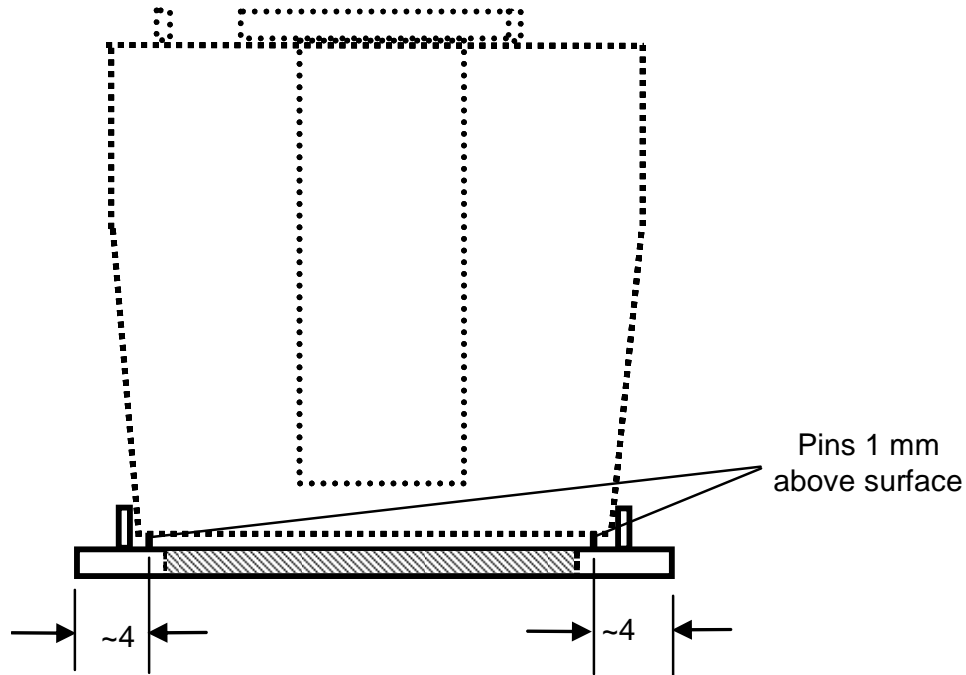


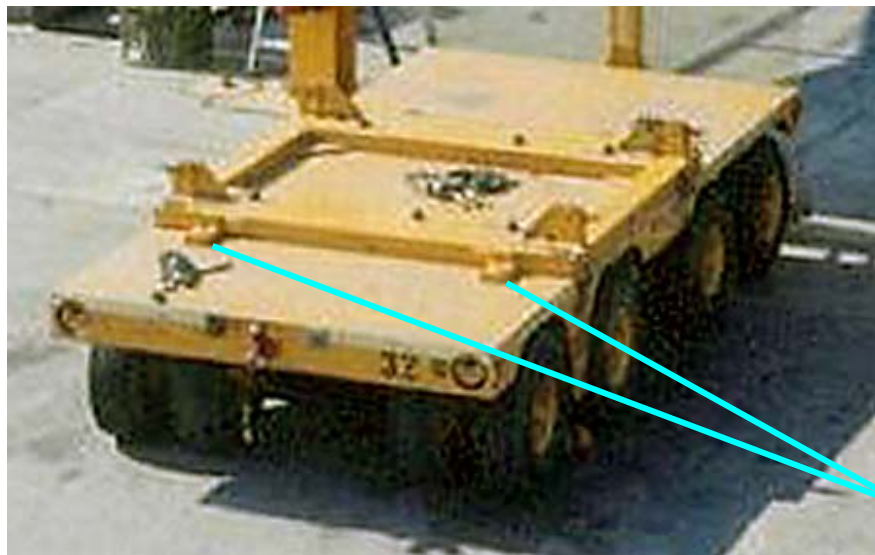
Figure 9. Cradle Guide Pin Locations

As modeled, these pins are very small and can hardly be seen with the clip installed so I decided to leave them off on my model. If you want to add them, follow the procedure below:

- 1) Position your completed bomb clip on the cradle with the panels oriented as shown below.
- 2) Mark the location of each panel on both sides of the cradle.
- 3) Measure approximately 4 mm from the outside edge of the cradle to each mark and drill a small hole for each pin.
- 4) Cut 6 pieces of 0.5 mm dia. wire or plastic rod to a length of 2 mm.
- 5) Insert and glue each pin so the top is 1 mm above the surface of the cradle.
- 6) Glue the bomb clip panels to the tops of the pins.

Step 4 - Build the Cradle Stops

The cradle "stops" were removable blocks that were used to lock the cradle in position fore and aft on the transporter as shown below. You will need to make a total of 4 stops. The dimensions for the cradle stops are given in Figure 11.



**CRADLE
STOPS**

Figure 10. Cradle Stop Location

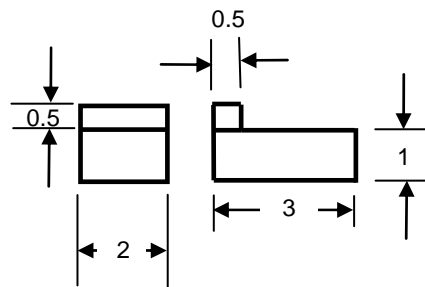


Figure 11. Cradle Stop Dimensions

- 1) Using 1 mm thick plastic, cut 4 rectangles each 2 mm x 3 mm.
- 2) Cut four 0.5 mm square strips 2 mm long.
- 3) Glue one of the 0.5 mm square strips to each of the 2 x 3 mm rectangles, as shown above.
- 4) Paint the stops the same yellow as your chosen transporter color and set aside for now.

Step 5 - Construct the Transporter Deck

Figure 12 shows the dimensions of the transporter deck. The deck consists of the transporter bed plus the side and end panels. The side panel dimensions are shown in detail - the end panels are simple rectangles. Note the designation of the front or tow end of the trailer, versus the rear or hook end.

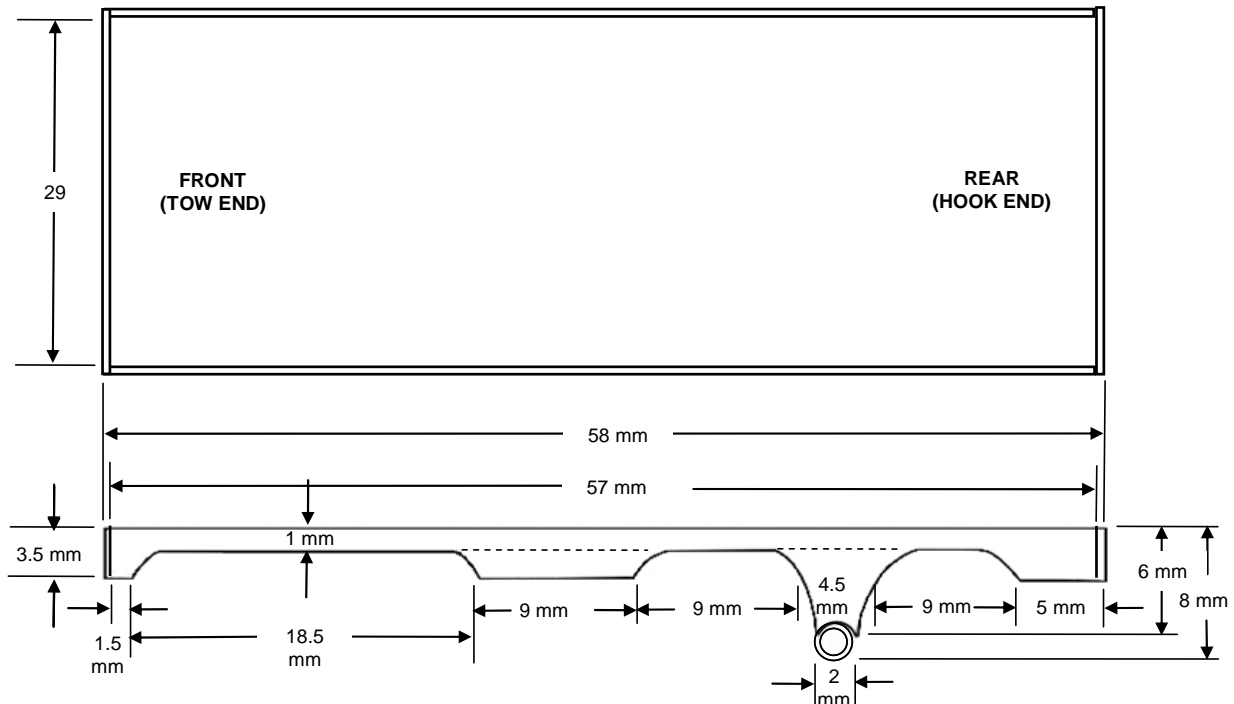


Figure 12. Transporter Deck Dimensions

Make the bed of the trailer from 1 mm sheet styrene with dimensions of 29 mm x 57 mm.

- 1) Use 0.5 mm sheet styrene to make two end panels 3 mm x 30 mm.
- 2) Use 0.5 mm sheet styrene to make two side panels 6 mm x 57 mm.
- 3) Cut the two side panels to the shape and dimensions given in Figure 12, or use the scale image provided below in Figure 13 as a template (simply print out this page and cut out the template).



Figure 13. Side Panel Template

- 4) First glue on the side panels - make sure the shapes match on both sides.
- 5) Then glue on the end panels.
- 6) Sand and fill the corners.
- 7) Paint the completed transporter bed.

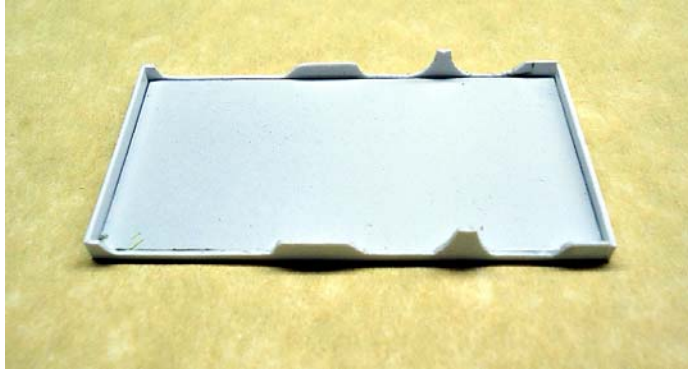


Figure 14. Completed Transporter Bed

Step 6 - Build the Undercarriage

The transporter undercarriage can be scratch built as desired. I've not been able to find any drawings or pictures of the actual undercarriage so I used what detail I could see from photos and pieced one together as shown below.

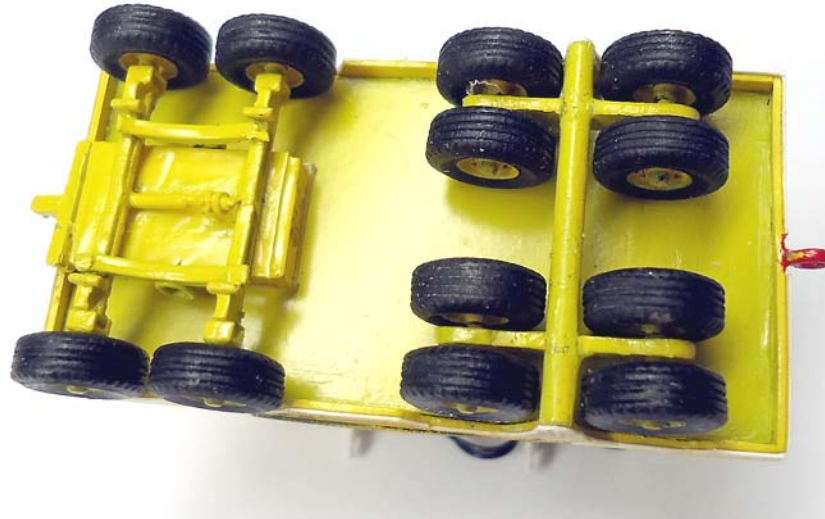


Figure 15. Transporter Undercarriage

I tried to keep it simple. I've provided the dimensions of my version (below) that you can use as a guide, or you can design your own. **NOTE:** Whatever design you use, be sure all of the wheel axels are 7 mm below the top of the trailer bed.

My model's undercarriage consists of a 4 steering wheels in the front and two 4-wheel bogies in the rear. Figure 16 shows the critical dimensions of the undercarriage.

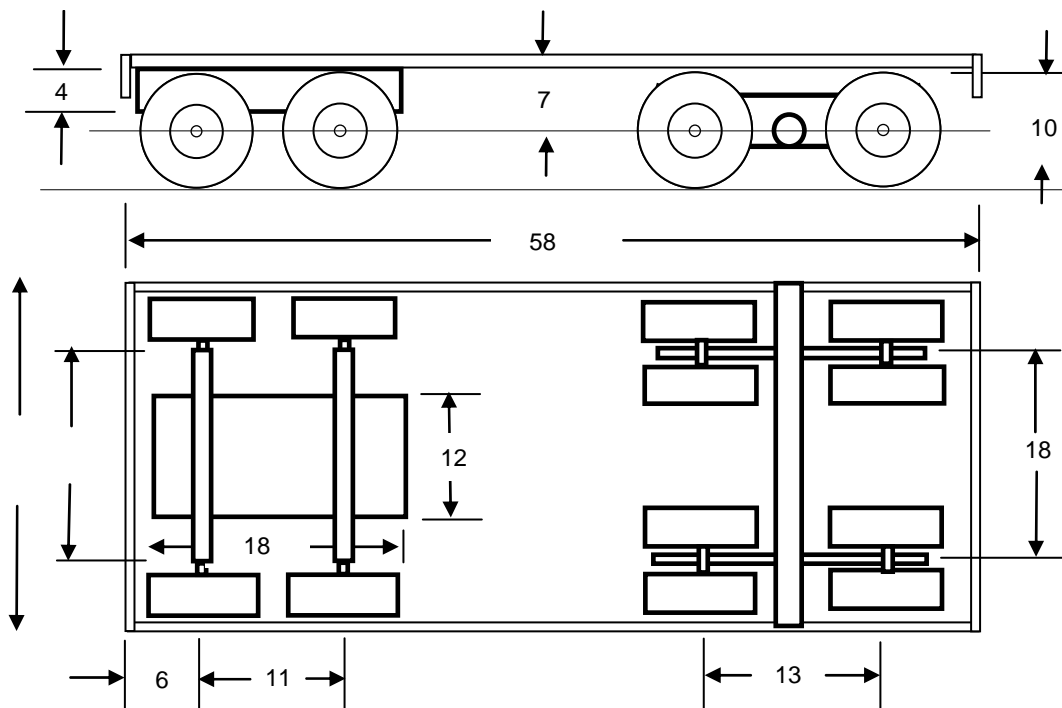


Figure 16. Undercarriage Dimensions

6A - Construct the Steering Assembly

In the actual transporter, the two sets of steering wheels were linked so they turned together when the tow bar moved. As a result, the front and rear steering wheels were always parallel with each other. I built my model with the steering wheels straight.

My steering assembly is based on an 18 mm x 12 mm x 3.5 mm box as shown in Figure 16. To this box I glued the axels from an MHU-12M Ammunition Trailer in the Hasegawa US Weapon Loading Set (#35005).

NOTE: If you don't use this method, the axles need to be mounted so the shafts are 7 mm below the top of the transporter bed.

- 1) Construct the sides of the box from 1 mm styrene. Cut two end pieces 3 mm x 10 mm and two side pieces 3 mm x 18 mm.
- 2) Assemble the box with the side pieces overlapping the ends of the end pieces and allow to dry.
- 3) Cut out a rectangular cover from 1 mm styrene to the dimensions of 12 mm x 18 mm and glue it to one side of the box. Paint the box yellow.
- 4) Make two axles 22 mm long with 1 mm diameter shafts on each end. Each shaft should be 2.5 mm long.
- 5) If you use the axles from the Hasegawa MHU-12M trailer (shown below), first cut off the molded on shafts.



Figure 17. MHU-12M Trailer Axles

- 6) Cut out 5 mm from the middle of each axle to shorten them to 22 mm.
- 7) Paint the modified axles yellow.
- 8) Drill a 1 mm hole in the ends of each axle and glue in a 1 mm shaft that extend 2.5 mm from the end of the axle. The total length of each modified axle, including shafts, should be 27 mm.
- 9) Glue the completed axles to the steering box so that their centers are 11 mm apart, as shown in Figure 16 and Figure 18.
- 10) Allow the glue to dry and paint the steering box and axles yellow.
- 11) Glue the open side of the box to the center of the underside of the transporter bed with the front axle positioned 6 mm from the front edge of the transporter
- 12) Assemble and paint the wheels, then attach them to the axle shafts. Ensure the outside wheels are just inside the side panels.

I added some scrap parts from an old truck kit; however, you really only need the axels as very little of the detail will ever show unless the model is turned over.

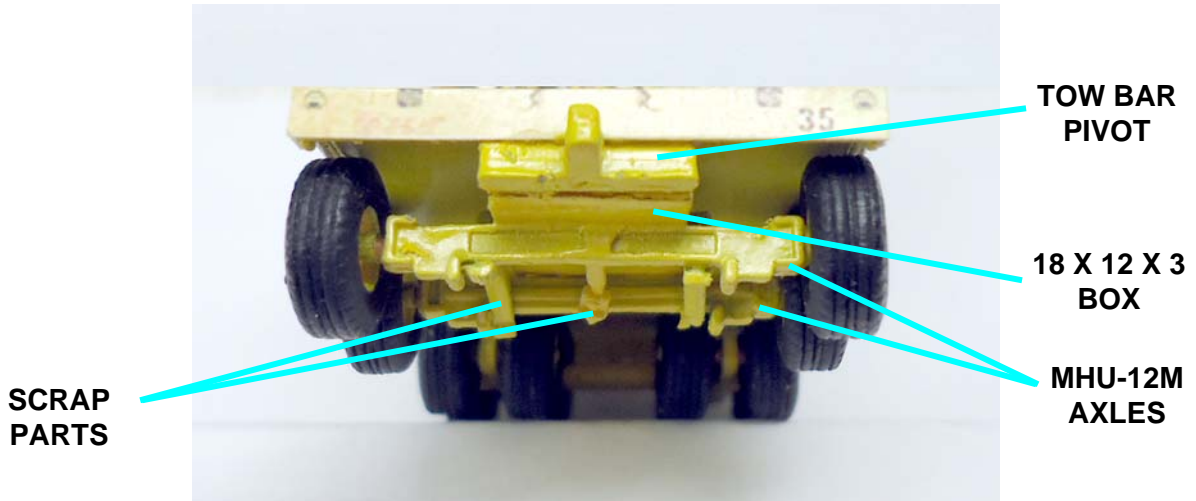


Figure 18. Steering Assembly Detail

6B - Construct the Rear Bogies

The dimensions of the two rear bogie frames are given in Figure 19, or you can use the template in Figure 20 - just print out this page and cut out the template.

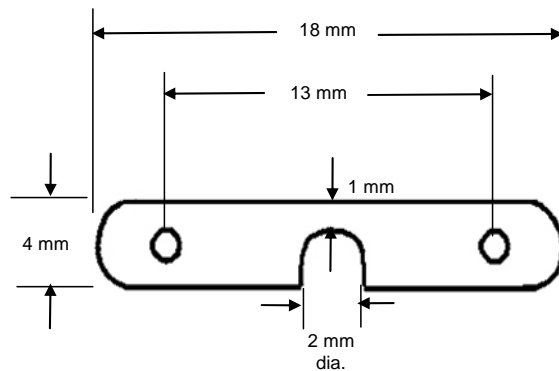


Figure 19. Bogie Frame Dimensions

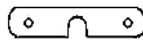


Figure 20. Bogie Frame Template

- 1) Fabricate two bogie frames from 1 mm styrene using the template in Figure 20. The shape of these frames is purely arbitrary so feel free to modify it or design your own.
- 2) Drill 1 mm holes for the axles.
- 3) Paint the frames the same yellow as your transporter.
- 4) Fabricate the cross bar from 2 mm round stock or sprue cut to a length of 29 mm.
- 5) Paint the cross bar to match the transporter.
- 6) At this time, verify that the cross bar will fit smoothly but not tightly into both notches in the bogie frames. Use a round file to widen the notches in the frames if necessary.
- 7) Cut 4 axles 7 mm long from 1 mm rod stock or 18 gauge solid strand wire and attach the wheels to the bogies as shown below. You may need to trim/file the axles to fit.



- 8) Turn the transporter on its back. Be careful not to break the loading brackets on the cradle.
- 9) Lay the completed bogies in line with the cross bar with the 2 mm slots facing up.
- 10) Glue the cross bar to the trailer side panels.
- 11) When the cross bar is dry, turn the transporter over and work the two bogies down onto the cross bar.
- 12) Adjust the bogies until the axles are 7 mm below the top of the transporter bed and all wheels are touching.
- 13) The outside wheels should be just inside the side panels.
- 14) Glue the bogie frames to the cross bar.

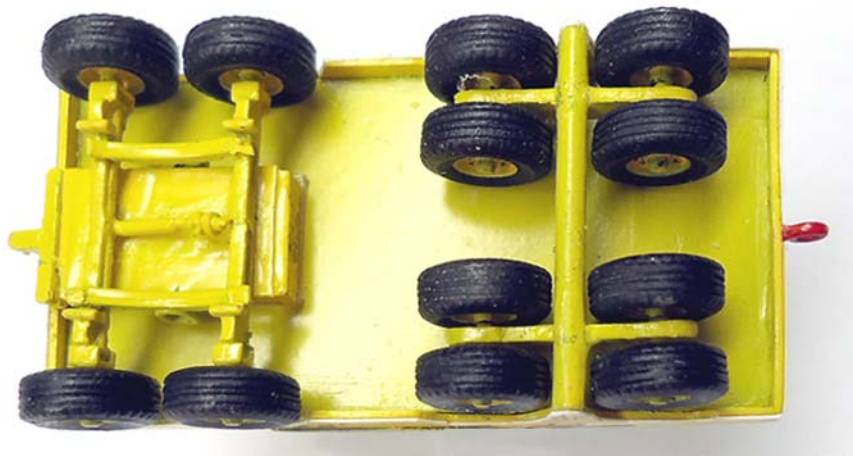


Figure 21. Completed Undercarriage

Step 7 - Add the Tow Bar

Each transporter trailer had a tow bar on the front and a hook on the rear. Because each loaded trailer weighed over 8 tons, they were towed to the aircraft individually. The empty trailers were then hooked together for the trip back to the munitions area.

You will need to fabricate a tow bar or adapt one from another kit. My tow bar is pieced together from the front portion of the MHU-12M trailer tow bar (part A18) and the back portion of the Hydraulic Lift Trailer tow bar (part A17) in the Hasegawa US Weapons Loading Set, as shown in Figure 22.

- 1) On part A17, cut off and save the first 8 mm from the pivot end of the tow bar.
- 2) On part A18, cut off and save the first 18 mm from the ring end of the tow bar.
- 3) Trim and sand the locking mechanism from A18.
- 4) Shorten the ring shank by 1 mm.
- 5) Glue the front part of A18 to the back part of A17. The overall length of the modified tow bar is about 25 mm.
- 6) Sand then paint the modified tow bar the same yellow as your transporter and paint the tow ring red, as shown below.

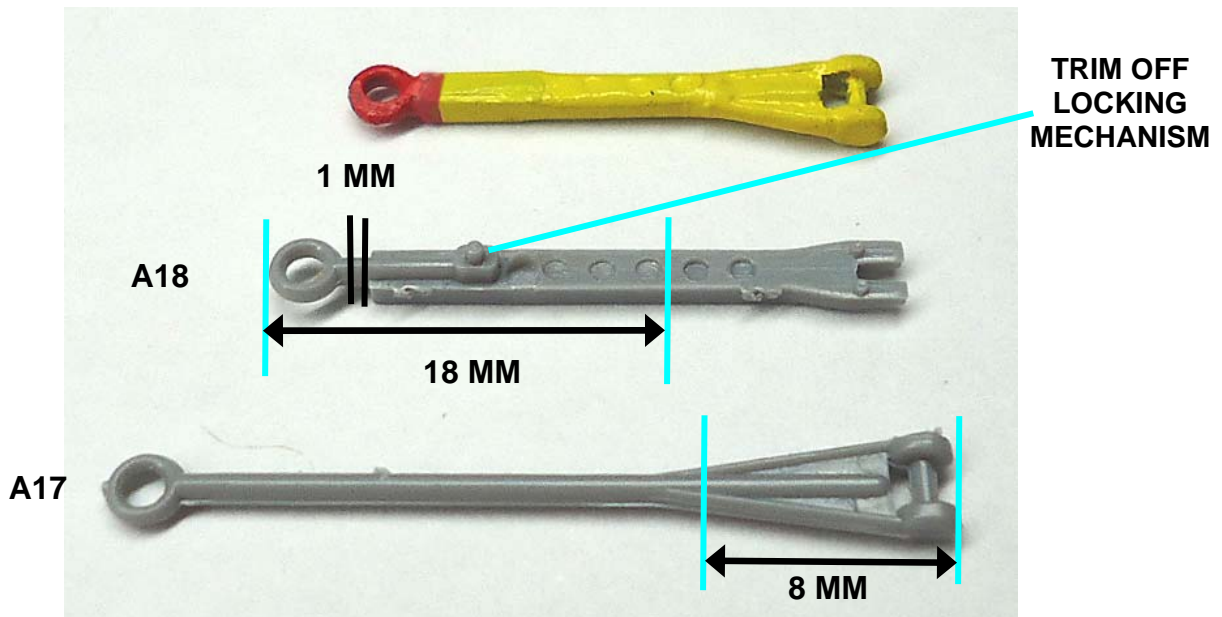


Figure 22. Hasegawa Set Parts 17 and 18 with Kitbashed Tow Bar

- 7) Cut off the pivot end of part A21 as shown in Figure 23 below.
- 8) Trim the sides of the pivot bar to ~12 mm to match the front of the steering box.
- 9) Glue the pivot to the front of the undercarriage steering box as shown in Figure 24.
- 10) Ensure the pivot extends far enough so that the front of the transporter does not interfere with the tow bar.

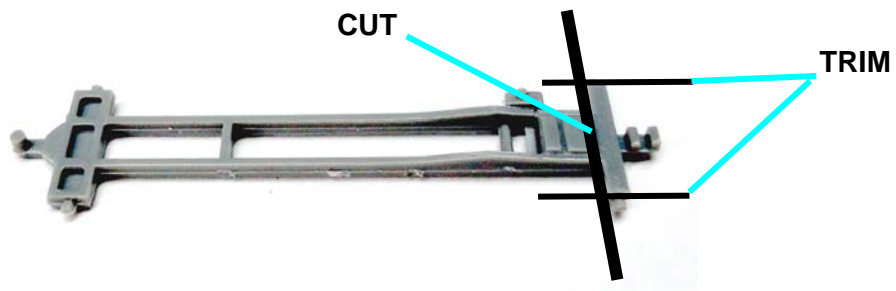


Figure 23. Tow Bar Pivot Cut from Part A21

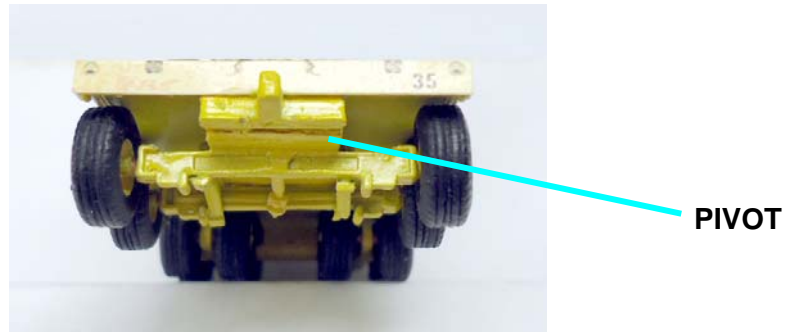


Figure 24. Tow Bar Pivot Attached

Step 9 - Add the Rear Hook

The hook on the back of a real transporter was a common type used on many vehicles and trailers. The hooks were made in two pieces. The top piece was hinged and was spring-loaded so it could be raised to insert the tow bar from a following trailer. The spring pulled the top of the hook closed and a safety pin was inserted to lock the two pieces together.

The hook assembly on the back end of my trailer was fabricated from a ring cut from another trailer tow bar.

- 1) Flatten the top and end of the hook, then cut the ring slightly above the center. Taper the cut ends where they meet.
- 2) Paint your hook red.

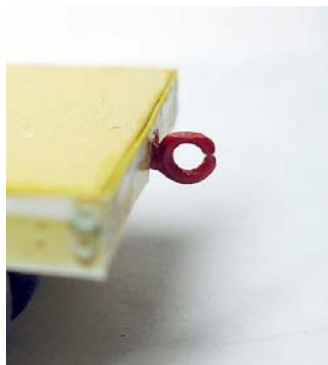


Figure 25. Rear Hook

Step 8 - Add Detail to the Side and End Panels

Now that your transporter nearly complete, it's time to add detail to the side panels. I decided to use pictures of the actual trailer's sides and ends (see Figure 26 below) and reduce them to the model size, then glue them onto the plastic panels. The results are surprisingly realistic as you can see in Figure 27 - and it saves a lot of work.

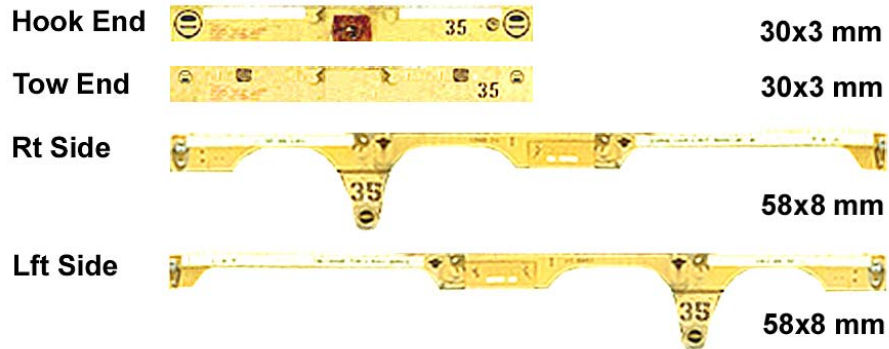


Figure 26. Side and End Panel Image File

If you would like a copy of the above file that includes five additional sets with different numbers, email me at striker8241@yahoo.com. You'll need to print the file on glossy photo paper using an inkjet or laser printer and then cut out the panels with a sharp knife.

- 1) Cut out each panel image. **NOTE:** When you cut out the panels with the razor knife, it will cause raised edges around the panels - leave these raised edges as this adds depth to the panels.
- 2) Glue on the two side panels. You may need to trim the plastic panels behind them to correspond to the image.
- 3) Carefully glue the two end panel images to their corresponding physical panels. **NOTE:** The image with the red rectangle goes on the rear (hook) end panel. You will need to cut a small slot in the red rectangle to accommodate the hook.



Figure 27. Side and End Panel Images Applied

Step 10 - Install the Cradle and Cradle Stops

- 1) Measure 17 mm from either end on the top of the transporter deck and make a mark.
- 2) On the other side of the deck, make a corresponding mark at 17 mm.
- 3) Align the long side of the cradle with the two marks and glue the cradle in place on the transporter deck as shown below.
- 4) Measure 7 mm from each corner and attach the 4 cradle stops, as shown in Figure 15.

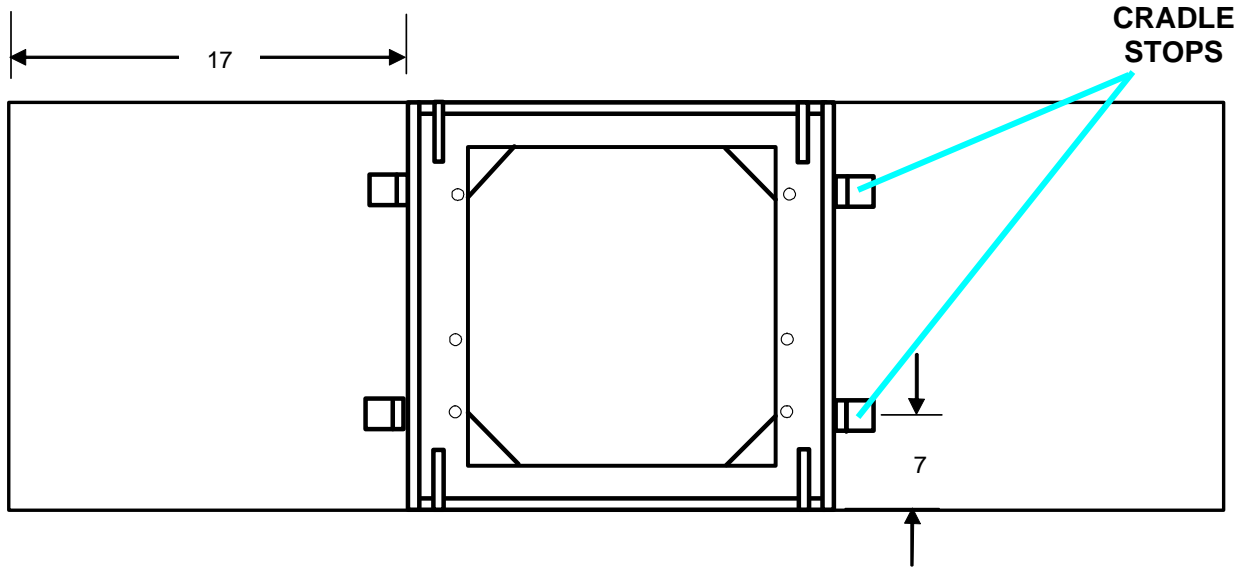


Figure 28. Installed Cradle and Cradle Stops

Completed Bomb Clip Transporter

Below is a completed transporter both with and without the bomb clip. I didn't add the chains and turnbuckles because I wanted to show the transporter being backed into the bomb lift trailer and the chains would already have been removed at that point.



Figure 29. Finished Transporter without Bomb Clip



Figure 30. Transporter with Bomb Clip



Congratulations on completing this project! I hope you enjoy your bomb clip transporter!

Optional Step - Attach Chains and Turnbuckles

When a bomb clip was being transported, it was secured to the transporter with four chains. Each chain had an adjustable turnbuckle to tighten it. Figure 1 shows an actual transporter with chains and turnbuckles while Figure 31 shows an earlier version of my bomb clip mounted on the transporter with chains and turnbuckles added.

- 1) Make 4 turnbuckles as shown in Figure 31. They should be approximately 10 mm long. **NOTE:** The above-ground detonators from 1/72 bombs are just about the right shape and size. You can also use styrene rod.
- 2) The chains are from an old necklace my wife gave me. You will need at about 180 mm of chain (~ 7 in.). Cut 4 pieces of chain, each appx. 40 mm in length. You will need to trim these after you thread them through the hanger eyelets.
- 3) Glue the chain to the top of the turnbuckle, then glue a turnbuckle/chain assembly to the side of the trailer, positioning each turnbuckle below a hanger eyelet on the clip.
- 4) Tie a piece of thread to the end of the chain and use it to thread the chain through the eyelet.
- 5) Tighten the chain and hold it next to the end of the chain secured to the turnbuckle. Mark a point about 5 mm above the turnbuckle on the secured end of the chain and trim the free end of the chain at this point.
- 6) Tie another piece of thread to the end of the chain and thread it through a link at the mark made in Step 5 and gently pull the chain taught. You may need to select a lower link to keep proper tension on the chain.
- 7) When the chain is tight, tie off the thread or glue the end of the chain to itself.



Figure 31. Chains and Turnbuckles Added (Earlier Version of Bomb Clip)

Optional Step - Construct an MMS Tool Box

Refer to Figure 1 for a picture of the actual tool box. This tool box was used by the Munitions Maintenance Squadron (MMS) loaders and probably carried special hand tools or electronic test gear, or possibly both. They usually had cushioned interiors to protect delicate tools and equipment.

There were a limited number of these tool boxes (depending on the number load teams) for the entire munitions squadron, so they were not kept with the transporters. They were most likely carried in the maintenance truck or on the bomb truck.

- 1) Using 0.5 mm thick sheet styrene, cut out five pieces 7 mm square.
- 2) Glue four pieces to form a box and glue the fifth piece to one end to form the lid.
- 3) Carefully round the corners of the lid, sides and bottom, as shown below.
- 4) Scribe a groove around the entire lid and down both edges of each side.
- 5) Use small dabs of silver paint to simulate latches. I made latches on all four sides but the lid could have been hinged on one side with only three latches. Both types of boxes were used for special equipment.
- 6) Make a handle for the lid. I used a thin slice of 1.6 mm I-Beam glued flat and painted silver.



Figure 32. MMS Tool Box