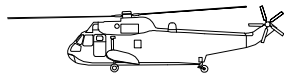


Belcher Bits

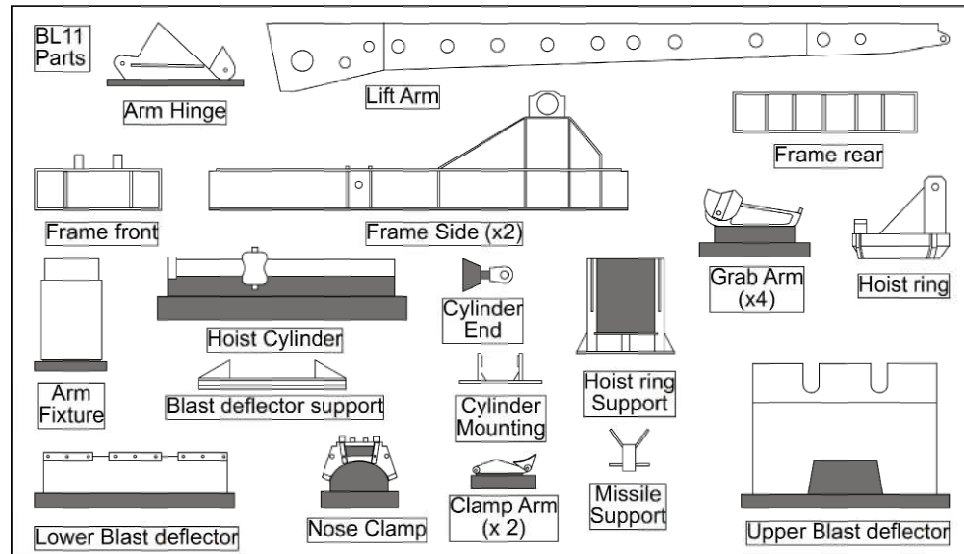
33 Norway Spruce Street,
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**Belcher Bits No. BL11:
Launcher for Bomarc 1/72**

Background

The BOMARC missile was intended as a long-range area defense weapon, armed with a nuclear warhead for taking on fleets of Russian bombers coming over the North Pole. Bomarc missiles were arranged in batteries of 28 per site, with each missile in a shelter with retractable roof. Inside the shelter, the missile launcher frame was suspended over a pit which housed the launch mechanical controls. The missile was clamped to the launcher arm. At launch, the roof was retracted, and the launcher arm was raised to vertical. The rear missile clamps held the missile in a vertical position, the forward clamps were released and the arm lowered part way. The main boost engine (within the missile body itself) ignited, the rear clamps released and the missile was away. At the rear of the launcher was a blast deflector which directed the boost engine exhaust horizontally, where it exited the shelter through a blow-out door. Once sufficient speed was attained, the ramjet engines took over for sustained flight.



While there were a number of Bomarc sites across the northern US and Canada, I believe all actual test launches were made from test facilities in Florida. Photos of Bomarcs raised to launch positions in operational shelters were part of training to test systems only.

Building the Model

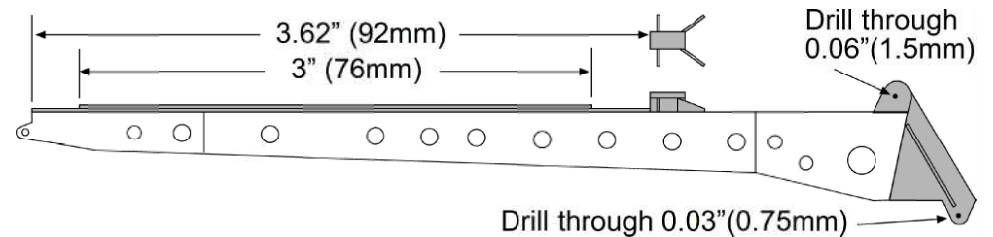
This resin kit represents the launcher for the Bomarc B (Belcher Bits set BL-9); the launcher for the A (set BL-10) was similar, but a different nose clamping arrangement was used and there were a lot more hoses at the bottom end, because the A version was liquid fuelled.

I'm not normally a fan of working features, but this kit is different. The arm can be raised or lowered, the missile clamp at the rear also articulates and if you want to put a bit of extra work in to it, you can even make a working hydraulic cylinder.

Like all resin kits, wet sand the bases to reduce dust and give all the parts a good scrub with detergent to remove any casting release agents.

The Launcher Arm

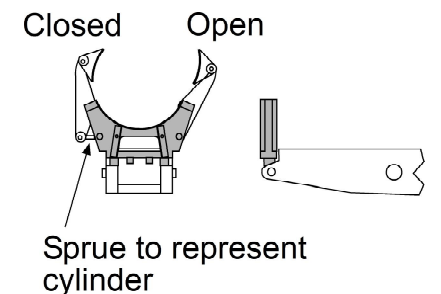
The arm structure was a steel box with lightening holes in the sides. These are cast in relief, but if you wish to open them up, I recommend you drill through half-way from each side. That way, any minor directional mismatch is hidden within the holes. Sand the top of the arm flat and glue the Arm Hinge in the slot at the end of the Lift Arm. Drill out the hole on top to 1/16" (1.5mm) and the hole on the bottom to 1/32" (0.75mm). Cut some 0.020" (0.5mm) plastic card to 0.3" (7.5mm) wide, and glue two pieces on top of the arm, the lengths and locations are shown below. Sand the missile support away from its mounting flash and glue it in place just behind the plastic card pieces.



The Front Clamp

The nose clamp is glued on the front of the lift arm, sitting on the small extensions as shown below. You may wish to sand the base of the nose clamp slightly to achieve a good fit, with the nose clamp at 90 degrees to the top of the arm.

The front clamp can be built open or closed, but because of the way the rear clamp works, it will be nearly impossible to fit a Bomarc missile in with the clamp in the closed position, and you will not be able to release the arm when the missile is raised. Glue the clamp arms spread just far enough (0.5" or 12.7mm) that the missile can be lifted out of the top.



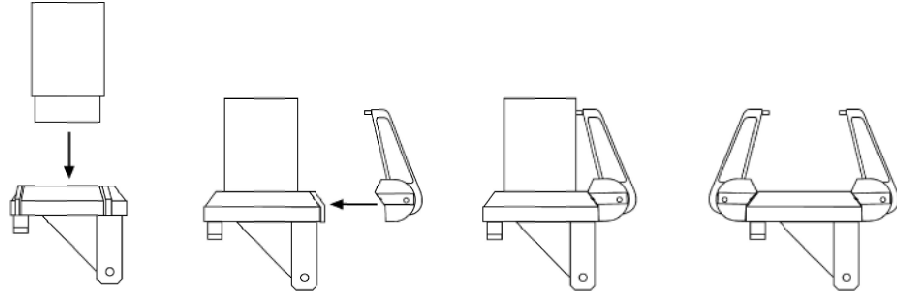
Because of the nature of this kit, it is **HIGHLY** recommended to paint certain sub-assemblies before final assembly. Furthermore, once the blast deflector goes on, it will be nearly

impossible to disassemble, so these instructions will note when to stop and paint.

The Lift Arm can be painted at this point.

Hoist Ring Assembly

This ring will support the aft end of the missile when raised to the vertical position. It is important it grips the missile securely, so an assembly jig which represents the aft diameter of the Bomarc is included. Drill through the holes in the legs of the hoist ring 1/16" (1.5mm) and clean up the central hole area.



1. Insert Arm Fixture into Hoist Ring. Do NOT glue!
2. Grab Arm fits over strip on side of Hoist Ring.
3. Ensure top of Grab Arm touches Arm Fixture, then glue base of Grab Arm to Ring.
4. Repeat 4 times then remove Arm Fixture.

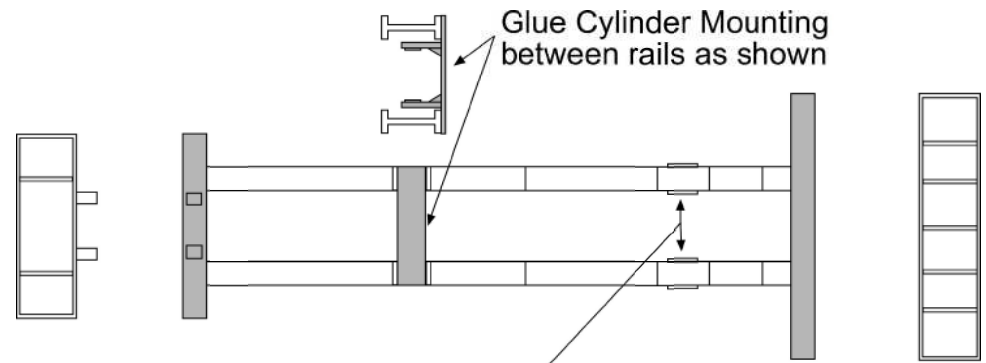
Put the arm fixture into the hole and tack lightly in place with white glue. Fit a grab arm over one of the four strips on the side of the ring, and glue it in place, ensuring that the pin on top of the grab ring touches the arm fixture. Repeat four times. When completed, remove the arm fixture from the ring, and you have a ring which will fit and support the Bomarc.

The Hoist Ring can be painted at this point.

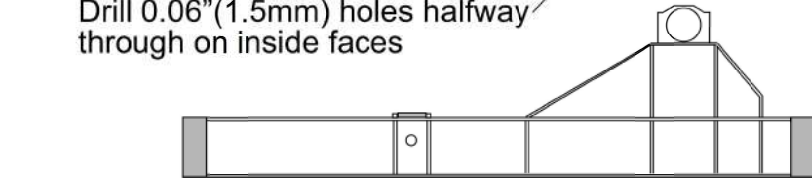
Frame assembly

The frame pieces are designed to slot together somewhat like Lincoln Logs, but the use of a piece of glass as a flat surface is well worth it. Building the frame nice and square will be rewarded by proper operation of the lift arm and hoist ring. Sand the frames bases flat and clean up the slots in the front and rear pieces. Open up the holes in the frame sides. Test fit the front and rear frames with the frame sides. Before gluing the frame side pieces, drill 1/16" (1.5mm) halfway through each hinge boss and assemble the frame with those holes on the **inside** as per the sketch following. Open up the holes in the cylinder mounting piece, and glue it in place between the frame sides. These holes should line up with the holes in the frames sides, although it is not necessary for the operation of the cylinder that the holes exactly line up

Once the main frame has been glued together, the hoist ring support can be attached as shown below. Cut a length of 1/16" (1.5mm) brass rod to 7/16" (11mm) long.

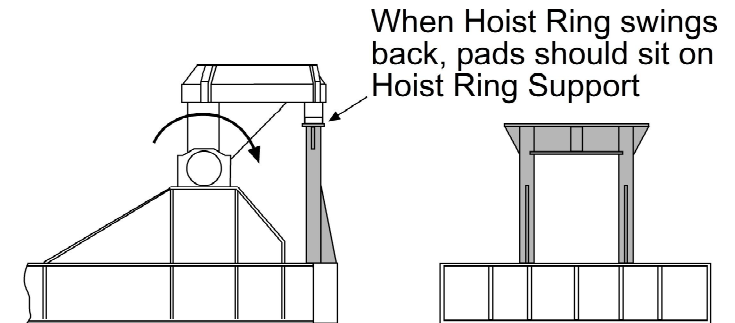


Drill 0.06" (1.5mm) holes halfway through on inside faces



This will be the main hinge pin. Temporarily fit the hinge pin in the hoist ring, carefully spread apart the frame sides at the top and slip the hoist ring assembly in place. Clean up the hoist ring support piece and fit it in position as shown below. The ring should end up perfectly horizontal (which means the Bomarc will end up perfectly vertical) when it is rotated back and resting on the hoist ring support. If it doesn't, shim or trim the pads as required.

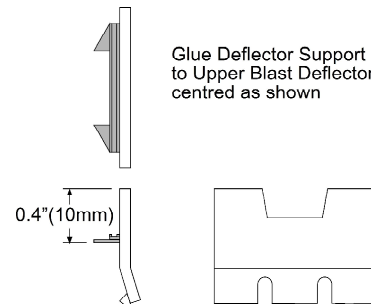
Carefully spread the frame sides, pop out the hoist ring and remove the hinge pin.



The Frame can be painted this time.

Blast Deflector Assembly

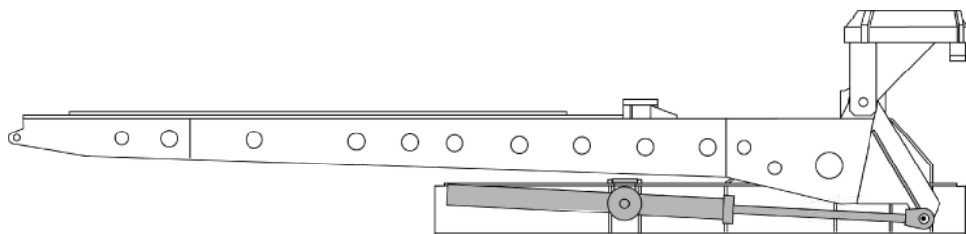
Clean up the Upper Blast Deflector and Deflector Support. Glue the Deflector Support to the Upper Blast deflector as shown in the sketch at right. Score and snap the lower blast deflector from its base and clean up the edge.



Cylinder Assembly

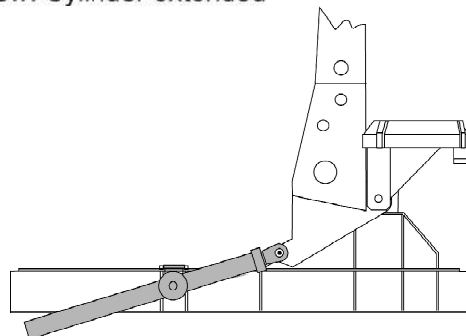
If you want to get really fancy, you can make a functional hydraulic cylinder (or at least, a moving hydraulic cylinder!) . Drill a 1/16" (1.5mm) hole through the length of the cylinder ... drill carefully from both ends, and you should meet in the middle. The cylinder could be painted at this stage if you wish. Cut a piece of 1/16" rod to 1.7" (43mm) long, and glue it to the end of the cylinder end piece, and drill through the holes in that piece with a 1/32" (0.75mm) drill.. Check to make sure the rod extends and inserts easily into the cylinder. Cut a piece of 1/32" brass rod to 0.2" (5mm) long and use it to pin the cylinder end between the arms on the bottom of the Arm Hinge. Check out the drawing below.

Use the main hinge pin that you made when you tested the assembly of the hoist ring. Insert it through the Hoist Ring and tab on the Lift Arm. Now spread the frame pieces apart enough to insert the Lift Arm/Hoist Ring assembly. From the bottom of the frame, carefully spread the legs of the cylinder mounting and snap in the cylinder. Lift the arm and you can see the hydraulic ram slide into the cylin-



Inside Frame view: Cylinder extended

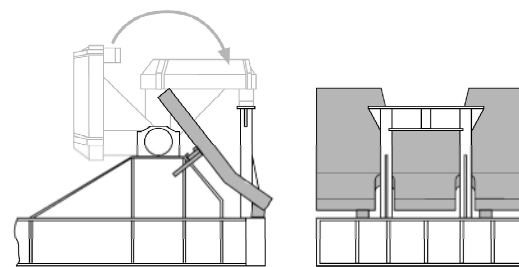
Now the more alert modellers will notice the cylinder actually sticks below the frame when the arm is raised, and during the raising, the tabs on the arm hinge go below the bottom of the frame briefly. This is correct, but inconvenient, because in full scale, this launcher sat over a pit so a protruding cylinder was not a problem. This also explains why whenever you see a real launcher on display (at the USAF Museum) sitting on the ground, the hydraulic cylinder is disconnected from the arm. If you want to display this model in all its working glory, you will need to raise it off a base by about 3/8" (10mm). The actual launcher sat on four concrete pillars at the ends of the front and rear frame pieces.



Inside Frame view: Cylinder retracted

References

1. *The Illustrated Encyclopedia of the World's Rockets and Missiles*, Bill Gunston, 1979
2. *US Strategic and Defensive Missile Systems 1950-2004*, Mark Berhow, 2005



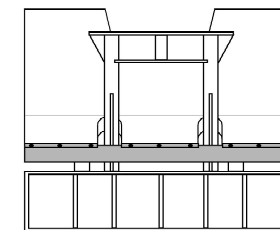
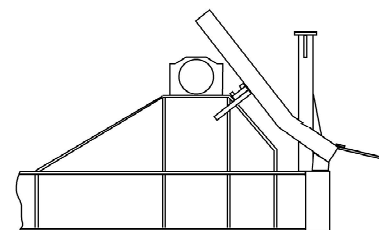
Before gluing Blast Deflector in place, test to make sure Hoist Ring pivots into place. Do not glue Blast Deflector to Frame until after all other items are assembled.

Blast Deflector Installation

This is the part that prevents you from bending open the frames to insert the arm, so make sure everything is operating (and painted) now because once this is on, that's it. Following the sketch, set the blast deflector in place and make sure the hoist ring clears it when raised. If satisfied, remove and paint. When dry, re-install and glue in place.

Final Step

The last step is to fit the lower deflector plate on the bottom of the blast deflector. The angle should not be horizontal, instead about 20 degrees down from horizontal.



Painting Instructions

As far as I know, there are only two launchers available for viewing today. The one at the USAF Museum (now in storage, I believe) was for a Bomarc A, and it was painted light grey. The one at the USAF Armaments Museum in Eglin, Florida (below) is painted a medium grey. However, most colour photos I have seen of these in service showed them a chrome yellow like much of othe USAF the supportr equipment. It makes a nice contrast to the missiles as well.





Above, one of the launcher shelters at ex-RCAF North Bay, ON, now rebuilt into storage units ... pity.

Below, an in-service shot from the mid-60s. Note that part of the launcher is below the 'floor' level.



Above, a view inside the decommissioned shelter. Note the pit in the back of the shelter. The area around the launcher was covered with a steel grating.

Below, a view into the pit. Note the columns at the back which supported the launcher and above them, the blow-out panel.

