

Belcher Bits No. BL10: IM-99 Bomarc A 1/72

Background

At the start of the Cold War, what kept US planners up at nights was the fear of fleets of long range Soviet bombers coming over the North Pole, raining nuclear bombs down on the heart of the US. Consequently, a tremendous effort was placed in air defence, resulting in NORAD, various long-range warning systems and a number of interceptor designs. At the end of the 1940s, this included the development of a long range pilotless interceptor by BOeing and the Michigan Aeronautical Research Center (the source of the name BOMARC). This missile was designed from the start for active homing since its long range precluded external target illumination. Propulsion was by two Marquardt ramjets, with a thrust of 10000 lb each in the initial Bomarc A, and 14000 lb in the final Bomarc B. Interestingly enough, the fuel was 80 octane gasoline; my car needs at least 93 octane and it doesn't go anywhere near as fast (Mach 2-2.5), but both have about the same range of 440 miles :)

The initial Bomarc A used an Aerojet liquid fuel rocket in the fuselage to achieve vertical takeoff and get up to speed for the ramjets to take over. However, liquid fuel rockets require time to fuel, cannot be stored fully loaded and can be dangerous when fueled. An accident at a launch site in New Jersey resulted in a fire which melted the nuclear warhead, so an improved Bomarc B was developed using a solid fuel booster. This also speeded up launch time to as little as 30 seconds. Launching from a specialized shelter, the split roof slid open, the launcher/erector lifted the missile into the vertical position then retracted and the missile took off under initial guidance from the SAGE radar/control system, then switched to internal control within 10 miles of the target. The missile was armed with a W40 10kt nuclear warhead, proving once again the old adage that close only counts in horseshoes and atomic weaponry.

Bomarc IM-99As were deployed starting in 1959, and IM-99Bs starting in 1961 but by 1965, it was realized that the primary threat was ballistic missiles, not manned bombers and the Bomarc was essentially obsolete. In 1959, Canada cancelled its Avro

Arrow interceptor program and opted for Bomarc instead. Two squadrons (28 missiles each) were deployed in Canada in addition to eight US sites. Today, the North Bay site in Ontario has been converted to storage units while the La Macaza site in Quebec has been made into a medium security prison (!).

Building the Model

Remove the nose and tail cones from their bases, leaving a bit of the standoff which will fit into the recesses in the fuselage ends, and glue in place. There are a couple small holes in the fuselage sides which mark the wing spar points. **(NOTE: These holes are located too far forward. They should be 3/16" (5mm) further back)**

I suggest drilling in with a 0.031" (0.75mm) drill, drill from each side and you should be able to end up with a straight hole through. Insert a short length of brass or steel wire and trim. Scribe the mounting line of the wings and snap off the base, then lightly sand the leading edge. The main wing mating surfaces have matching holes so drill straight in at these points and the wings should slide right on the wire. It is best to fit these and get them straight and level, and fill ny gaps prior to fitting the engines. There are slots in the wing leading edges for pitot tubes. Photos show a variety of configurations, but the missile on display in Ottawa has a pitot tube on the starboard wing, and a stub only on the port wing. Other photos show pitot tubes on both wings. Use a piece of 0.040" (1.0mm) rod 0.62" (16mm) long, and taper the front end. Open up the slot in wing 0.125" (3mm) deep, glue in the pitot tube and fair into position with putty.

The elevators are removed from their base in the same manner. These have slots indicated only on the bottom side, since the pitot tubes mounted on these seem to have been slung under the elevator rather than faired in to the leading edge. Again, check photos since some indicate only one, while others show both. Cut the rod to 0.56" (15mm) long, taper both ends , and glue under the elevators where the slots indicate, leaving 0.35" (9mm) of tube ahead of the elevator leading edge. The elevators can then be fitted and glued onto the fuselage, the trailing edge in line with the start of the booster nozzle about 0.6" (1.5mm) from the aft end. The elevators are at the same level on the fuselage as the wing.

Glue on the vertical fin, with the aft end in line with the end of the elevators. Fill all joints and sand smooth.

Ramjet engines

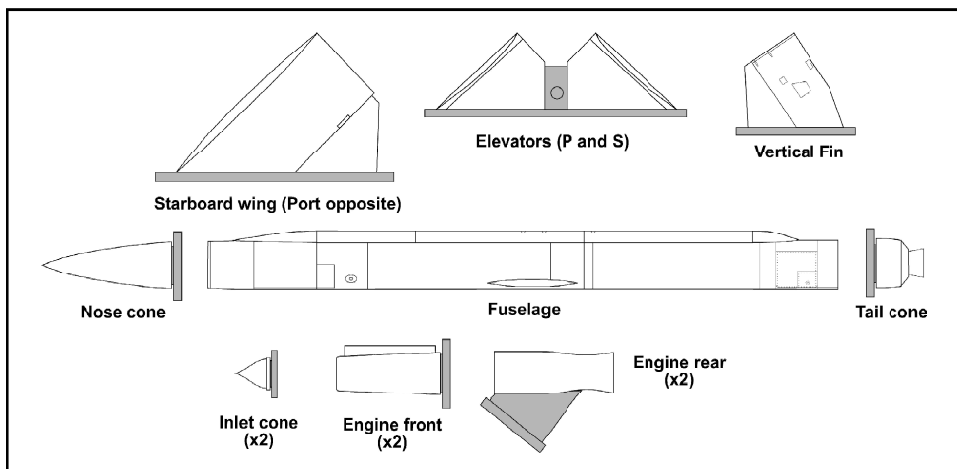
Remove the inlet cones, engine fronts and engine rears from their bases. Trim the inlet cones flush, but leave a bit of a standoff on engine fronts. Remove the engine rears from their mountings and sand the joint smooth.

Glue the inlet cones in the intake of the engine fronts. Test fit the engine rear to the engine front, but do not glue at this time. The engine rear is natural metal while the rest of the airframe including the engine front is painted, so it's easier to paint these parts separately and glue only at the final stage.

There are slightly raised standoffs on the fuselage sides indicating where the ramjets attach, so glue the engines in position and fill the seams.

Painting

Early Bomarc As were overall black with white wingtips on top (white wings with black tips underneath) and the underside of the tailplane, the wings aft of about 25% chord and the rear fuselage were natural metal. Ramjet rear and booster nozzle were dark



natural metal. The nose cone was darkish beige and there were white stripes around the nose (decal strips are provided for these). There appeared to be a black stripe on the starboard white wingtip; that stripe was white on the port black wingtip underneath.

Operational Bomarc As were generally overall ADC Grey, with an off-white radome. A decal sheet is provided with markings for two aircraft, although the aircraft tail number is actually for a B ... pictures of operational missiles are very hard to find.

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**

A word about distinguishing between As and Bs

There were some differences between the A and B models, particularly the fuselage and where the wings were located on it. On the A, the fuselage is slightly longer and the wing and the ramjets are positioned further aft. The gap between wing and tailplane is a dead giveaway. There were also differences in the ramjet and booster engine nozzles. A kit of the Bomarc B is also available from Belcher Bits as set BL-9.

...and what about the launcher?

This is available from Belcher Bits as set BL-11. It represents the later IM-99B launcher. However, the launcher for the A is very similar, with a different nose area of the boom, different clamp and more hoses leading into the base of the boom (for fueling the liquid fueled booster).

