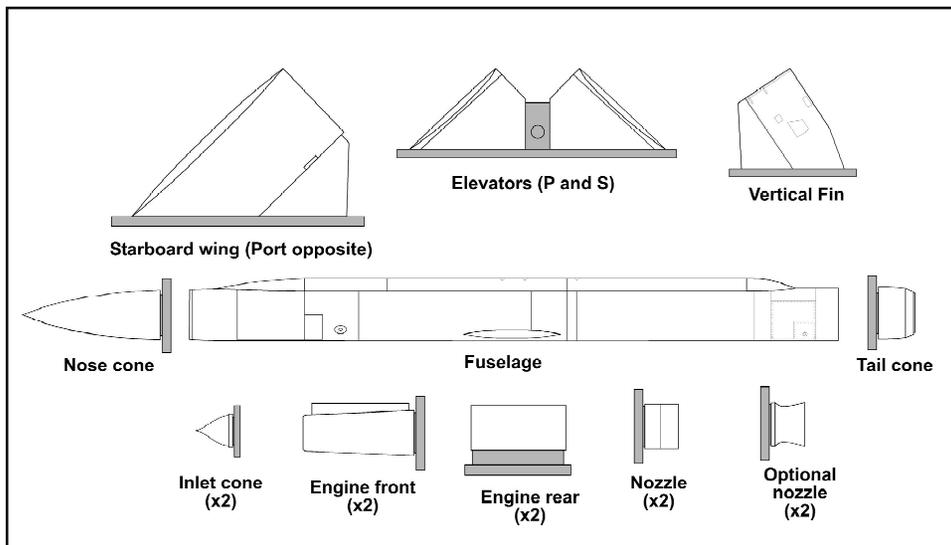


Belcher Bits No. BL9: IM-99 Bomarc B 1/72

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

Glue the inlet cones in the intake of the engine fronts, and glue the nozzle to the rear of the engine rear. 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 light grey, 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.

Close inspection of the nozzle of the IM-99B will show that it only appears cylindrical. In fact, it has the traditional convergent-divergent shape but has a cylindrical

cover screen with small round holes. For those adventurous enough to try to replicate this, we provide as an option the shaped nozzle, undersized enough to roll a strip of fine photo-etched screen around it.

Painting

Operational Bomarc Bs were generally overall ADC Grey, with an off-white radome. Ramjet rear and booster nozzle were dark natural metal. Markings were fairly simple and can be sourced from other decal sheets.

References

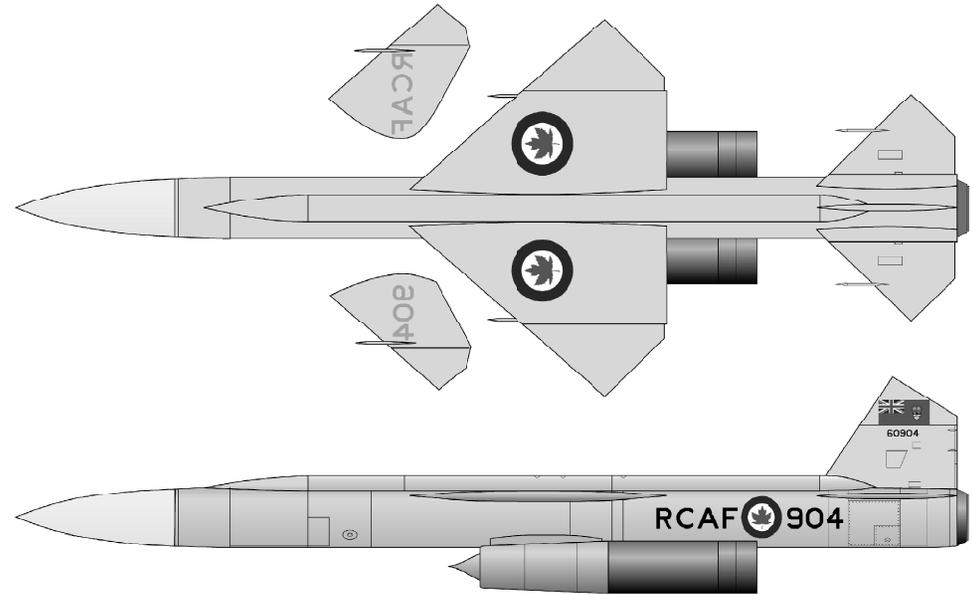
1. **The Illustrated Encyclopedia of the World's Rockets and Missiles, Bill Gunston, 1979**
2. **US Strategic and Defensive Missile Systems 1950-2004, Mark Berhow, 2005**

A word about the IM-99B

Please note that as far as I can tell, all kits and most published drawings of the Bomarc are based on early A models and are not accurate for the IM-99B. There were some differences between the A and B models, particularly the fuselage and where the wings were located on it. This kit was made using information drawn from a variety of sources, including scaling from photographs and from existing airframes and is as accurate in outline as possible.

...and what about the launcher?

This will be coming shortly from Belcher Bits and will represent the later IM-99B launcher. It will be available separately or packaged together with this kit as a combination kit.



A word about markings

Operational missiles were overall light grey with an off-white radome; the aft end of the ramjets were dark natural metal. USAF machines had 25" national star and 16" USAF on both upper and lower wings, 25" national star on the fuselage sides and 8" U.S. AIR FORCE on the forward fuselage. RCAF machines had 36" roundels above the wings and 12" RCAF and last 3 below. On the fuselage sides were 24" roundels and 12" RCAF and last 3. On the tail was a 29" Red Ensign, with 4" serial number below.

