Belcher Bits No. BL3:
British Nuclear Weapons 1/72

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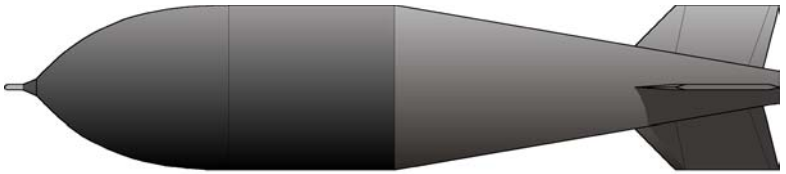
Background

The history of British nuclear weapons is a fascinating story that has never been fully covered in print. It is an unusual mix of determination to develop indigenous designs, coupled with the realization that US development was advanced both in technology and scale. Great Britain had some of the foremost physicists at the turn of the century, and British scientists played key roles in the development of the atomic bomb. However, Britain lacked the absolutely enormous infrastructure required in the mid-late forties to process the weapons grade materials in any significant quantities, and weapons development lagged. As a result, British nuclear weapons reflected contemporary US designs but with a unique twist. Finally, the British practice of assigning colour-based code names to weapons definitely is more interesting than US mark numbering; Blue Bunny, Green Granite and Indigo Hammer were all nuclear warhead designs which did not proceed into service.

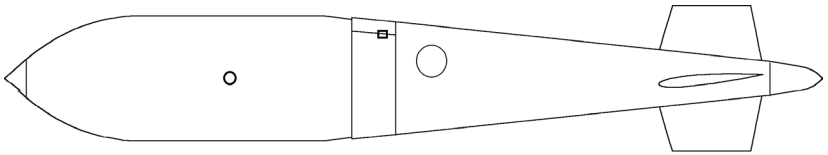
Blue Danube

The first British operational weapon, Blue Danube was a 20 kt Plutonium design similar to the US Mk 4. However, while the US weapon was fitted into an improved Fat Man stubby style casing, the UK warhead was housed inside a large streamlined casing, with aerodynamic roots in the Grand Slam designs of WWII. This physically large weapon was extraordinarily influential because it dictated the bomb bay dimensions and load carrying requirements for the V Bomber designs. The casing was 60 inches in diameter and 24 feet long, with a weight of 10,000 lb. Only about 20 entered service starting in 1953.



Blue Danube

Above, note the prominent fuse aerial in the nose, best simulated in this scale with some wire, and filletted in with some epoxy. Below, for comparison purposes, a Grand Slam bomb also shown in 1/72. ...



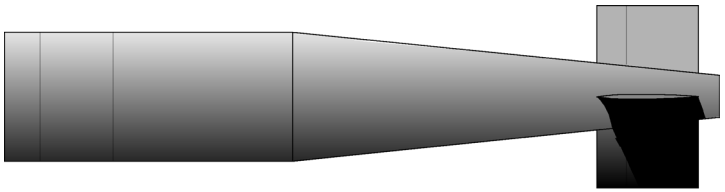
Grand Slam 22,000 lb MC

Yellow Sun

The development of fusion weapons quickly overtook fission designs, because they used less of the costly fissile material, while offering greatly enhanced yields. The Yellow Sun Mk 1 was a megaton-class weapon (more than 1000 kt) and was housed in a casing 48 inches in diameter, 21 feet long. Considering the shapely Blue Danube casing, the Yellow Sun was decidedly utilitarian, with a flat, blunt nose and straight tail fins … apparently, with that much explosive power, aerodynamic considerations were not as important. A small number entered service in 1958.

The original design of the warhead for the Yellow Sun was a British development but like early US thermonuclear weapons, it left much to be desired from a safety, reliability and maintainability point of view. In 1958, it was decided to replace the 'guts' of the weapon with the Red Snow warhead, generally assumed to be a license-built version of the US Mk 28. This compact warhead easily fit inside the big casing and the first of 150 Yellow Sun Mk 2 entered service in 1961, replacing the Blue Danube as the principal weapon of the V Force and remaining in use until 1972.

The Blue Steel air-surface missile (not included with this set) which displaced gravity nuclear bombs with the V Force used a similar warhead.



Yellow Sun

Red Beard

This was a second-generation boosted fission weapon, in the 5-20 kt class. Its smaller size (36 inches diameter, 12 feet long and 2,000 lb) meant it could be carried by tactical aircraft as well as larger bombers. It served on RN fleet carriers, carried by Scimitars and Buccaneers, as well as with RAF units. It entered service in 1961 and over the next ten years, approximately 80 were in RAF service, with 30 in FAA stockpiles.

Red Beard

WE-177

Nuclear weapons showed a remarkable reduction in size over the twenty years following WWII, allowing them to be carried by many different aircraft types (even helicopters!). The WE-177 is believed to have been a development of the US B-61 bomb and was delivered in three distinct versions. The WE-177A (16.5 inches diameter, 112 inches long, 600 lb) had a yield of 200 kt, while the longer WE-177B (133 inches) had double that. The WE-177C had the same size casing as the A but was much smaller capacity (10 kt). It was intended as a tactical weapon (or nuclear depth charge) and may have been based on the US B-57 design. WE-177 A and B entered service in 1966, the C by 1971. All were removed from service by 1998, leaving the Trident SLBM warheads as the only nuclear weapons in British service today.

Postscript

In the US Atomic Museum in Albuquerque, a former RAF WE-177 is on display with a full description of the weapon. However, in the FAA Museum in Yeovilton, an unlabelled WE-177 sits forlornly on a weapons cart behind obsolete torpedoes and depth charges. Without a doubt, not one person in a thousand visiting that Museum is aware they are looking at a weapon which once had ten times the destructive power of the Hiroshima bomb.

WE-177 A/C

WE-177 B

Assembly

This set includes parts for a Blue Danube, Yellow Sun, Red Beard, and two WE-177 (an A/C and a B). The nose and tail sections of the larger bombs are are cast vertically using a thin standoff, so they can be cut off the bases using a thin razor saw, leaving a reduced diameter step in place. The resin rings supplied sit over this step and fit the two parts together; they are designed so that you can fill the seam on the rectangular section, and leave the other seam unfilled as it represents the transport joint between nose and tail. Attach using cyanoacrylate glue or five minute epoxy. I find it helps to use a V-block, or failing that, some right angle corner like a short length of aluminum angle to keep nose and tail sections aligned while gluing them. For the Blue Danube, separate tail fins are supplied. For the Yellow Sun, cut four fins of 0.020" (o.5 mm) plastic card using the drawing as a guide.

Painting

To be honest, unknown, at least for operational weapons. My guess would be overall dark green in keeping with current practice for other bombs. Training rounds or handling dummies may have been overall 'practice round' medium blue.

WE-177 are usually seen with a red tube strapped to the rear of the bomb. If this follows US practice, this likely contained the necessary wiring harness required to hook the bomb up (no simple arming wire for nukes!), and would be removed once the bomb was loaded. WE-177s also typically had red plastic protective covers over the nose cap and fin edges, which also would have been removed when loaded.

Shameless Self-Promotion

If you like big bombs but are concerned about getting weapons grade poly-urethane under your nails, why not try Belcher Bits set BL2. It includes parts for WWII RAF 2000, 4000, 8000 and 12000 lb HC bombs, the famous Cookies and Blockbusters carried by RAF heavy bombers, in 1/72 scale.

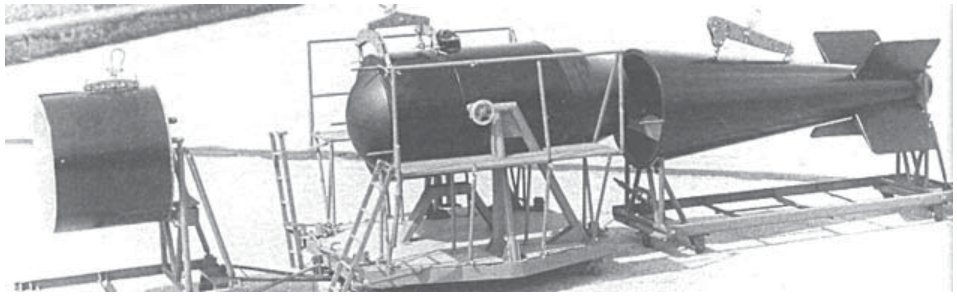
References

1. History of the British Nuclear Arsenal, Federation of Atomic Scientists website www.fas.org

2. United Kingdom Aerospace Projects and their code names, www.skomer.u-net.com

3. UK Nuclear Weapon History, www.keconnect.co.uk/~defcon

4. Bombs Gone by J. MacBean and A. Hogben, 1990 (excellent reference on RAF bombs of all sorts)



Note the difference in the 'guts' of the Yellow Sun Mk 1 (above) and Mk 2 (below)