



GET SMART!

PAVEWAY & THE RAF

Continuing our series on the development of some of the UK's most historically significant aerial weapons, **CHRIS GIBSON** — with the help of superb specially commissioned technical illustrations by **IAN BOTT** — describes the genesis and evolution of the American-designed laser-guided bomb that became a vital part of the RAF's ability to operate as a "smart" air force

IN HIS TWO-PART *Striving For Accuracy* series in *TAH44* and *TAH45*, James Jackson described British post-war efforts to achieve precision in bombing with freefall and early guided weapons. Most of these attempts proved fruitless, stymied by the weather or the sheer size of the equipment. Post-1960, and the move to nuclear-capable ballistic missiles, efforts focused on guided weapons; but, once again, those such as the Hawker Siddeley Dynamics AJ.168 TV-Martel turned out to be . . . disappointing. Sometimes a bit more explosive power than a Martel's 330lb (150kg) warhead was required, but freefall bombs still lacked precision.

While undoubtedly an American innovation, the laser-guidance of bombs and other weapons has become well established in airborne weaponry. One — Paveway — is built in the UK, and the RAF has probably dropped the most of any air force other than the USA's air arms.

FROM SATURATION TO INTERDICTION

The post-war period saw weapons development become focused on nuclear weapons. However, during the wars in Korea and Indochina, air forces realised that there was a need for a weapon that could be used to attack bridges and other point targets. Previously these would have been attacked by a bomber formation saturating the area with



An RAF BAe Harrier GR.7A of No IV (AC) Sqn carries a pair of Enhanced Paveway II laser-guided bombs (LGBs) on its inner wing pylons during an exercise aboard HMS *Invincible* in the Gulf of Oman in 2005. The Harrier delivered both weapons on to the Omani bombing range before returning to the carrier 40 miles off the coast during Exercise Magic Carpet, part of Operation Marstrike 05.

BELOW LEFT Paveway III was a refinement of Paveway II, which tended to suffer from "snaking", the new variant incorporating a scanning laser seeker with a larger field of view and proportional control in place of Paveway II's "bang-bang" all-or-nothing control surfaces. This example is a GBU-24 Paveway III with a 2,000lb warhead.



bombs in the hope that one or two might hit the target. The alternative during the Second World War was the "earthquake bomb", such as Tallboy or Grand Slam, which could be used against such targets. These only needed to impact close to the target, which would collapse into the camouflet (sealed pocket of smoke and gas) created by the bomb exploding deep beneath the surface. Targets such as the battleship *Tirpitz* in Norway still required a number of strikes with Tallboys to neutralise them; approximately 60 (in three separate operations) for the *Tirpitz* — which still needed a direct hit to sink it.

By the mid-1960s Tallboys and battleships were long gone and the large bombers (certainly those in British service) were approaching their twilight years. Another factor was the increased capability and abundance of anti-aircraft systems, the guns and missiles that protected such targets, so a degree of "standoff" was required, hence the adoption of TV-Martel by the RAF and the American-built Martin AGM-12 Bullpup by the Royal Navy's Fleet Air Arm.

Meanwhile, in south-east Asia, American forces were attempting to stop materiel moving south from North Vietnam along the so-called Ho Chi