Air-to-Surface

BLUE STEEL
ROYAL NAVY

During 1962 this inertially guided "stand-off bomb" has become operational with squadrons of RAF Bomber Command. Conceived by A. V. Roe & Co in 1934, Blue Steel was at an early stage subjected to a severe "stretching" process, and today it can carry a thermonuclear warhead at supersonic speed over a distance sufficient to enable the carrier aircraft to remain outside the main line of present anti-aircraft defences of potential enemy targets. The missile manoeuvres by twist-and-steer, control in the rolling and pitching planes being effected by wing elevons and by foreplanes on each side of the nose. Propulsion is provided by a Bristol Siddeley Stentor rocket engine, with large and small thrust chambers burning high-test peroxide and kerosene.

Ground support equipment includes a road transporter based on the AEC Matador chassis, from which it is transferred by a davit-like arrangement on to a low-loading trolley by ML Aviation. After positioning beneath the Victor B.2 or Vulcan B.2 carrier aircraft, the trolley raises the weapon by hydraulically actuated cradles until it comes up against the crutch pads and can be secured. Both aircraft can be jammed to a single Blue Steel on the centreline. The bomber's AEI digital computer produces information for the missile up to the point of release, whereas upon its own Elliott Brothers inertial system takes over. Presumably Blue Steel can be programmed to approach its target along a variety of paths and at high or low altitude, and radar cross-section is much less than that of the parent aircraft.

BULLPUP
US NAVY (Air/Surface Missle N-7), US AIR FORCE (Guided Air Missile 83), ROYAL NAVY and other NATO forces

Experience in Korea emphasized the need for a missile which could be launched from even a relatively small (e.g., carrier-based) attack aircraft beyond the range of defending enemy fire, yet which could be guided accurately to a point target. The Orlando Division of the Martin Company produced the original ASM-N-7 by adding to a US Navy 250lb bomb a solid rocket motor, tracking flares and a radio-command guidance system governing control fins around the nose. This version became operational in April 1959 on the A-4A Skyhawk and AF-1E Fury, and successful firings have also been made from the SH-34 and numerous successful flights with this missile have been made over land from the Ticonderoga.

A year ago it was announced that the Royal Navy had adopted Bullpup as a standard weapon for the Buccaneer, Scimitar and Sea Vixen, and N-7a missiles are now flying on all three types of aircraft. In April of this year it was further announced that a version will be built in Europe for NATO use under a co-ordinated production programme. Prime contractor is the Norwegian firm Kongaberg Vapenfabrikk, assisted by de Havilland Aircraft in Britain and a company in Turkey. The US Navy is responsible for administration and technical support and Martin is training personnel and supplying master gauges, test equipment and, initially, components.

Further Bullpup development is assured by a contract placed in April for an entirely new USAF version, for which Bendix is named as associate contractor. The new missile—which will not have a "GAM-83" designation—will be an all-weather version. "Walleye" TV guidance and TVGIC television-inertial guidance have both been associated with it, and several other guidance systems could be used on a weapon of this type.

FRENCH MISSILE

In addition to the Nord weapons described presently, the Armée de l'Air may receive a new stand-off missile for use by the supersonic Mirage TV bomber. The Chief of Staff, Gen P. Stehlin, has suggested it would have a range of 185 miles.

HOUND DOG
US AIR FORCE (Weapon System 131B, Guided Air Missile 77)
MATCHED to the Boeing B-52G bomber, which carries one beneath each inner wing—and will be modified to carry two more—between the engines—this air-breathing missile has been under development by the Downey plant of what is now North American Aviation's Space and Information Systems Division since August 1957. Hound Dog is powered by a Pratt & Whitney 352 turbojet and has Autometrics stellar-inertial guidance. Powered flight test began in April 1959, and deliveries to SAC commenced in March 1960. Late last year deliveries started on the GAM-77A, which incorporates improvements aimed at overcoming previous deficiencies, and numerous successful flights with this missile have been made over land from Holloman AFB and over water from Eglin AFB. In July a C-133 was assigned to handle deliveries, carrying three missiles instead of the two accommodated by the C-124 previously used. This suggests that production has reached its peak, although field testing will continue for a further year.

NORD AS.12
FRENCH NAVY
DIFFERING from the SS.12 (Tactical section) principally in having radio, instead of wire, guidance, AS.12 has been successfully fired from aircraft of quite high performance, such as the Breguet Alizé. It is not known to have entered squadron service.

NORD AS.20
FRENCH AIR FORCE and NAVY, ITALIAN AIR FORCE, WEST GERMAN AIR FORCE and SOUTH AFRICAN AIR FORCE
BASED upon the AA.20 air-to-air weapon, this missile is steered to its target by an