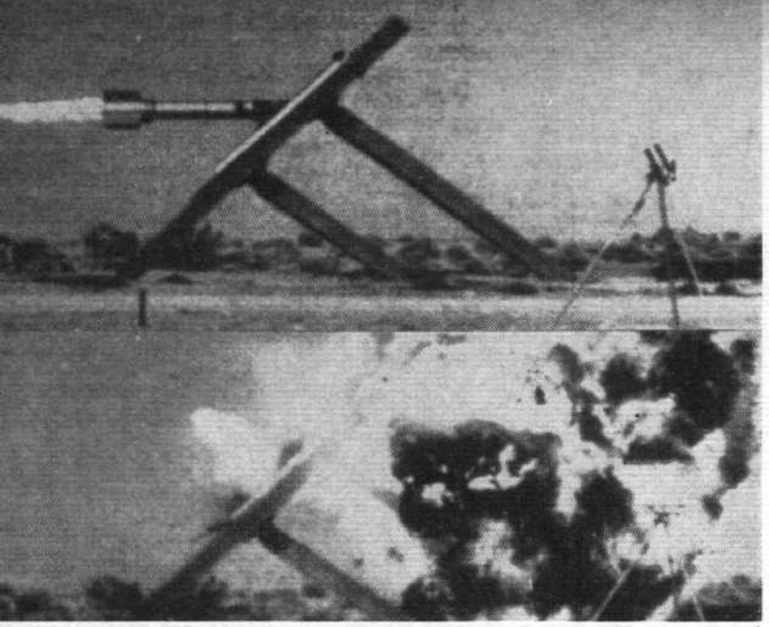
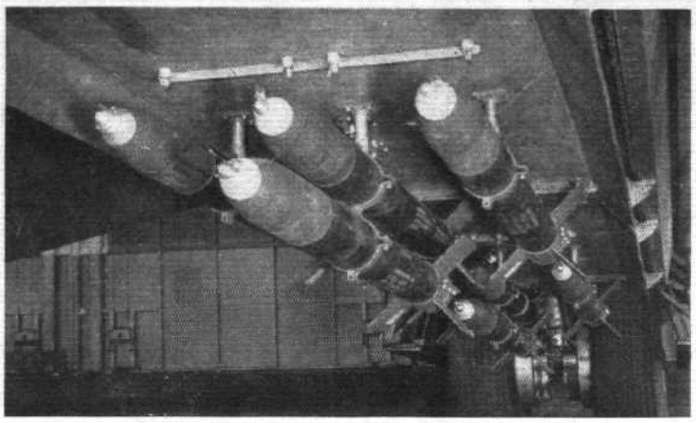


Firing tests of the 11.75in Tiny Tim rocket projectile.



Mounting of 5in HVARs in Martin rotary bomb-bay of XB-51.

MISSILES AND PROJECTILES . . .

A 60 lb rocket is known to be a standard French weapon and two others are designated "4-90 No. 2" and "120 C.C. No. 2." A heavy rocket—5-*pouces*—weighing over 140 lb, is also available. A special 9 lb anti-personnel rocket has been developed in France since the war and some 200 of these weapons could be carried by such aircraft as the S.E. Grognard or S.O. Vautour. A unique launching device, permitting discharge at the rate of 1,800 rounds a minute, has been flight-tested on Grognard prototypes. In the course of trials, incidentally, it was discovered that the plastic rocket-firing terminals, weighing only an ounce or two, made considerable dents in the heavy-gauge leading-edge skin of the low-placed tailplane. It was realized that jettisoning even such small parts at high speeds could be dangerous, and a new type of rubber terminal had to be developed.

Guided Anti-tank Missiles. In addition to standard types of air-to-ground rocket projectile, a specialized guided weapon has been developed for use with the Potez 75 "tank-stalker" (see *Flight* May 14th, 1954). Employment of this weapon from helicopters is also foreseen. The missile itself is wire-controlled and is a development of the French SS-10 anti-tank weapon, specimens of which have been acquired for U.S. Army tests. (The SS-10 is a finned missile, stabilized by a high-speed gyro and controlled from an optical sight by electrical impulses transmitted through wire to spoilers on the fins. Upon impact the sight is automatically re-set for the next run).

Air-to-Under-Water Missiles. Of these weapons—inspired by German investigations and hastened in development by the menace of the submarine—the most advanced is probably the Fairchild Petrel (XAUM-N-2). Powered with a Fairchild J44 turbojet—possibly jettisoned before the missile dives into the sea—the Petrel is built to designs initiated by the National Bureau of Standards and is air-launched from Bell HSL anti-submarine helicopters. According to one report it is intended "only for training."

The heat-seeking Eastman Kodak Dove (XASM-N-4) is thought to be a missile in the same class, in one respect at least—that it embodies an under-water self-homing device.

Bombing-up an R.A.F. English Electric Canberra with 1,000-pounders.

Unguided Bombs. Bombs having no guidance systems, and with conventional explosive, incendiary and chemical fillings, continue to be developed for a variety of purposes and in numerous sizes. British bombs of post-war design include a 5,000-pounder for the English Electric Canberra—for which aircraft a known load is two 1,000 M.C. (medium capacity) bombs, two 1,000 lb Mk 8 bombs, and two 800 lb incendiary clusters. Combinations of greater total weight are presumed to be possible.

Typical general-purpose bombs are of 500, 750, 1,000, 2,000, 4,000, 12,000 and 22,000 lb nominal weight.

A British development for the R.A.F. is a V.T.-fused bomb—a 1,000-pounder for day, night and all-weather tactical employment. The fuse is similar to the radio proximity pattern for anti-aircraft shells, and can be set to act with fair accuracy at any one of three predetermined heights above the ground. At a demonstration in Germany during 1953 V.T. bombs appeared to be exploded at 80ft above ground level.

Troops in slit trenches, soft-skinned vehicles and stores and aircraft on the ground can be effectively dealt with by V.T. bombs, the blast and splinters from which are directed downwards over an area which can be accurately determined according to the pre-set height of the burst. In conjunction with remote ground control, the V.T. system allows extremely effective bombing to be done "blind," and from a high altitude, from an aircraft not even fitted with a bomb-sight.

The post-war years have seen the development of specially streamlined stores for external carriage on high-speed aircraft, and the U.S. Navy has a universal "shape" of very low drag for use on transonic and supersonic machines. Designed by Douglas for the Bureau of Aeronautics, it is known under the designation Aero X-1A External Store and may be in the form of a bomb, a fuel tank or a weapons container. Carrying three 2,000 lb bombs of this design, an unspecified aircraft—presumably the Douglas Skyshark—flies over 50 m.p.h. faster than with three standard 2,000 lb bombs, and under specific conditions range is increased. When two of the new stores are used as 150 U.S. gallon fuel tanks the Douglas F3D Skyknight flies over 24 m.p.h. faster than with two conventional-type tanks of the same capacity.

Low-drag bombs developed by the U.S.A.F. for such aircraft as the North American F-100A Super Sabre are 500-, 1,000- and 2,000-pounders, described as "high-explosive supersonic bombs." These can be carried in conjunction with the Pastushin Aviation Corporation forcible-ejection pylon, which ensures that they clear their carriers without damaging the airframe. An ejector charge separates the bomb at transonic or supersonic speed, regardless of aircraft attitude. Another forcible-ejection system for the F-100A is manufactured by the Bohanan Mfg. Company and utilizes twin pistons, actuated by cartridges and exerting a force of 20,000-30,000 lb, through an 8in stroke directly on to the mounting lugs of the tank or bomb.

Little can be said of modern British bombing equipment, but it is known that the Armaments Division of A. V. Roe and Co., Ltd., have developed a triple bomb-carrier designated A.V.151, weighing about 42 lb and carrying three 1,000 lb bombs, measuring 16.5in to 17.8in in diameter. It is presumed that this fitment has been developed for the Vulcan bomber. (Avros, incidentally, have also been working on a single-cell flare chute for stores up to 6in in diameter and 40in in length.)

A notable advance in American bombing technique was the introduction, on the Martin XB-51 three-jet tactical bomber, of a pre-loaded rotating bomb-door, which, immediately prior to the