fairings and two-stage motor. One pair of wings have ailerons, to limit rate of roll, and the control surfaces are at the rear. Trials from Canberras and Vautours at Colomb-Béchar are encouraging, and weapon-system firings are in hand from Mirages at Cazaux. The R.530 is to be the primary armament of the Mirage III. Matra are looking at the NATO military committee requirement for a standard air-to-air missile, and are collaborating with de Havilland in this field.

NORD 5103 (AA.20)

Radio-command missile

FRENCH AIR FORCE, FRENCH NAVY (*Air/Air Missile 20, Type M2RT*)

BY setting their sights at a not too ambitious concept, Nord-Aviation achieved operational capability with this weapon in 1956. As was remarked in our full description of it on July 15, 1960, "Although the AA.20 was from the outset intended to be a fully effective operational weapon, it was generally regarded as an interim missile pending development of the R.530 series . . ." Accordingly, it is steered by command signals in a coded radio link, governed by a miniature joystick manipulated by the pilot of the launching aircraft. This means that the target and missile flare must be visible to the pilot right up to the point (50ft distance) at which the proximity fuze is triggered. Steering is effected by pitch and yaw demands which bias the interruption of vibrating spoilers in the two nozzles from the sustainer. AA.20 is in use from ten types of French aircraft, and has given rise to later air-to-air and air-to-surface missiles.

NORD 5104 (AA.25)

Radar-command missile

FRENCH AIR FORCE (*Air/Air Missile 25*)

ADOPTION of radar command guidance makes it no longer necessary for the pilot of the launching aircraft to see the target or steer the missile. This weapon is compatible with the Cyrano radar of the Mirage III, and has also been integrated with US and British radars.

RED TOP

IR-homing missile

ROYAL AIR FORCE, ROYAL NAVY

REVEALED since our 1960 review, this weapon has a performance and lethality very much greater even than that of Firestreak, which it is destined to replace and from which it has been evolved. The prime contractors, de Havilland Aircraft (formerly de Havilland Propellers), have stressed how difficult it is to achieve a hit "under the most adverse conditions," and state that new techniques give Red Top "greatly enhanced capabilities." Compared with Firestreak, the main components are rearranged: the warhead has gone to the obvious place—up front, next to the fuzing system—and the control actuators are moved aft, next to the surfaces they drive. Full body diameter is maintained from front to rear, making room for a larger warhead and motor; and performance at great heights is improved by the new wings and control fins. The Red Top display model has an IR head covered by an octagonal glass nose, like Firestreak. While development is hustled to meet the requirements of late-model Lightnings and other aircraft, D.H. are collaborating with the French Société Matra on radar guidance and other aspects of similar weapons.

SIDEWINDER

IR, or IR and radar, homing missile

US NAVY (*Air/Air Missile N-7*), US AIR FORCE (*Guided Air Rocket 8*), US MARINE CORPS, ROYAL NAVY, ROYAL CANADIAN NAVY, *and air forces of 12 nations including Australia, Japan, Nationalist China and Sweden*

NO better tribute can be paid to a product than a long list of presumably satisfied customers, and Sidewinders have been bought by (and given to) more nations than any other missile. Developed at the Naval Ordnance Test Station at China Lake, California (see 1957 review), the original N-7, or SW-1A,

AIR-TO-AIR MISSILES: 1, Sispre C-7; 2, Sparrow 3; 3, Matra R.530; 4, Genie; 5, Firestreak; 6, Nord AA.20; 7, Red Top; 8, Russian missile carried by Blinder; 9, GAR-4A Falcon; 10, GAR-11, Nuclear Falcon; 11, Russian missile carried by large (Mikoyan?) delta; 12, SW-1A Sidewinder; 13, Russian missile for all day fighters