

Air-to-air missiles 1, Anab; 2, Ash; 3, Atoll; 4, Sidewinder; 5, Advanced Sidewinder; 6, Firestreak; 7, Red Top; 8, Sparrow; 9, Falcon 4D; 10, Falcon 4F; 11, Nuclear Falcon; 12, Super Falcon; 13, Phoenix; 14, Matra 530; 15, Matra 515; 16, Genie

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mounted on a tracked transporter and utilises a command-guidance system. Ganef is about 30ft long, with a body diameter of 32in. Three launchers, complete with missiles, can be transported in an An-22 aircraft.

Goa First seen in 1964, this two-stage missile is standard armament on ships of the Soviet Navy. It has a length of 20ft and is carried on a twin launcher.

Griffon Although this mighty rocket has been trailed through Moscow regularly since 1963, no photographs or films have ever showed it in operational use. Soviet commentators describe it as anti-ballistic missile, but it is best regarded as a long-range anti-aircraft weapon with limited capability against certain types of tactical ballistic and air-launched missiles.

Guideline Day-to-day use of this standard Soviet SAM in Vietnam has underlined its shortcomings, especially at low altitudes. It achieved notable successes against U-2 reconnaissance aircraft over the Soviet Union and Cuba some years ago. Enormous numbers have been produced and supplied to Russia's friends and allies throughout the world. Development continues and the latest version, first displayed in November 1967, may well have a nuclear warhead.

Guild An absentee from recent Moscow parades, Guild appears to be a dual-thrust solid-propellant missile, about 39ft long. Like Guideline, it was always seen on an articulated trailer behind a truck.

5 - Air-to-air Missiles

FRANCE

Matra R.511 In continued but diminishing service on Vautour II-N and Mirage III-C interceptors of the French Air Force.

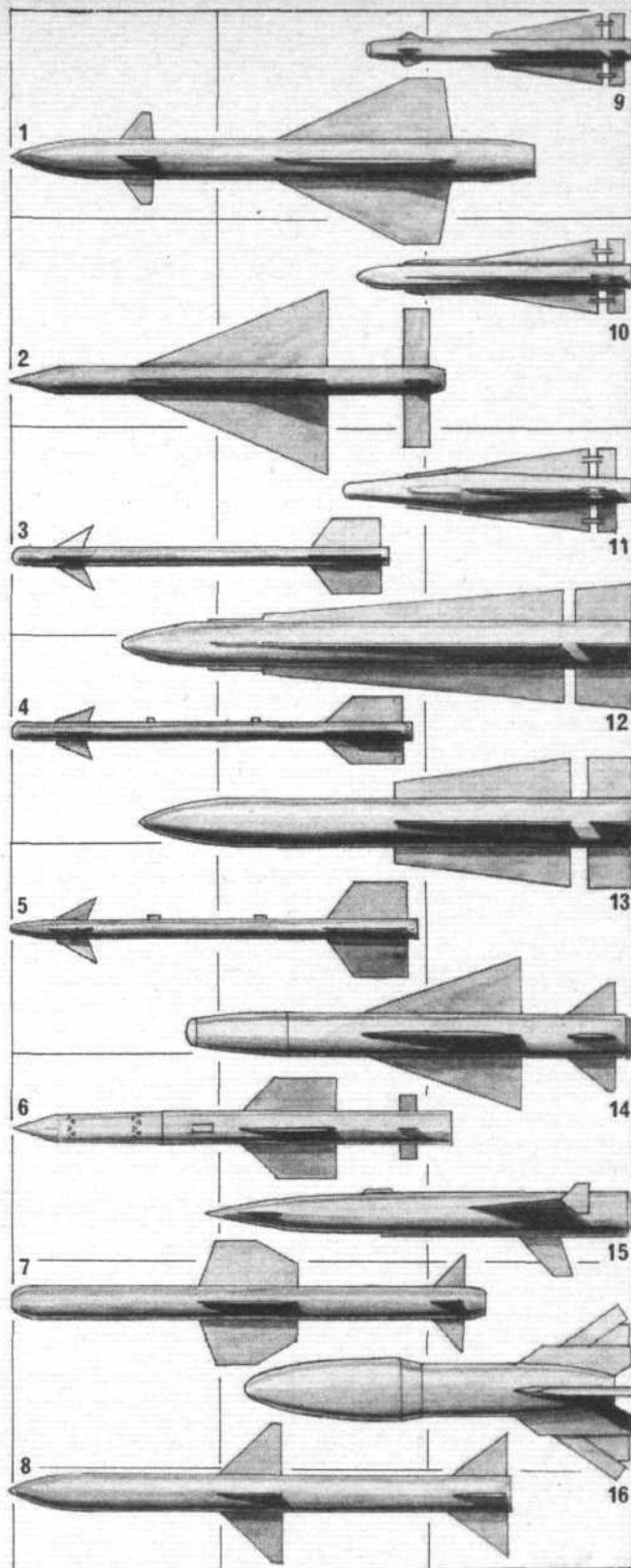
Matra R.530 Many hundreds of R.530s have been delivered as primary armament on Vautour and Mirage interceptors of the French Air Force, F-8E(FN) Crusaders of the French Navy, and Mirages of the Royal Australian, Israeli and South African Air Forces. They can be used for collision-course attack and are available with interchangeable infra-red and semi-active radar homing heads. Production continues.

GREAT BRITAIN

Firestreak Standard armament on Lightnings of the RAF and Saudi Arabia and RN Sea Vixens, this pursuit-course missile has achieved an 85 per cent success rate in trials under all conditions.

Red Top Perhaps the most cost-effective AAM yet produced, Red Top is interchangeable with Firestreak on the Sea Vixen F(AW)2 and later marks of Lightning. It is not limited to pursuit-course attack.

Taildog Benefiting from combat experience in Vietnam, Hawker Siddeley Dynamics are studying the need for an AAM with a capability mid-way between unguided rockets and long-range weapons such as Firestreak. Taildog would embody HSD experience in infra-red guidance and would utilise highly miniaturised elec-



Missile No	Propulsion	Guidance	Control	Warhead
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	Hotchkiss-Brandt solid: 1, 3,530lb; 2, 440lb 18,740lb Hotchkiss-Brandt solid Solid motor Solid motor 6,000lb Thiokol M58 solid 6,000lb Thiokol M46 solid 6,000lb Thiokol M46 solid Thiokol M60 solid Lockheed packaged liquid Rocketdyne solid Thiokol SR49-TC-1 solid Rocketdyne Mk 36 Mod 5 solid Rocketdyne Mk 38 Mod 2 solid Solid-propellant	Pursuit, semi-active CFTH radar homing Collision course all-angle, IR or semi-active IR homing by prime Advanced IR homing by prime IR homing by prime CW semi-active radar homing by prime IR homing by prime Semi-active radar homing by prime IR and pulsed Doppler by prime Radar homing by prime Spin-stabilisation only IR homing Raytheon CW semi-active radar homing IR homing	Twist and steer elevons plus foreplane Four rear fins plus roll ailerons Four rear-mounted fins Four rear-mounted fins Four trailing-edge controls Four trailing-edge controls Four trailing-edge controls Four trailing-edge controls Four trailing-edge controls Four rear-mounted fins Trajectory stabilised by flip-out fins + gyro Canard cruciform fins Cruciform moving wings Canard cruciform fins	55lb h.e. 60lb h.e. 50lb h.e. 68lb h.e. h.e. h.e. 40lb h.e. Nuclear h.e. or nuclear h.e. Nuclear (1.5kT) 10lb h.e. 60lb h.e. h.e.