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WORLD MISSILE SURVEY

a new seeker head developed by Marconi Space and Defence
Systems and an EMI fuze. In turn, Raytheon has received
information about the MSDS head.
Operator Royal Air Force (F-4, MRCA).

McDonnell Douglas Astronautics AIR-2A Genie An unguided nuclear-warhead weapon designed to destroy bomber fleets. Operators US Air Force Air Defence Command (F-106), US Air National Guard (F-106, F-101B), Canadian Armed Forces (CF-101).

Hughes AIM-4, AIM-26, AIM-47, HM-55 and HM-58 Falcon Falcon entered service in 1955, and more than 45,000 have been built. Two basic types have been produced: semi-active radar guided and infra-red homing. Some aircraft types carry a combination of both missiles—infra-red for low-level com-bat and semi-active for use in poor weather.
AIM-4A Developed from the original Falcon, GAR-1, AIM-4A (semi-active) still arms USAF intercepters.
AIM-4D (HM-58, Kb28) AIM-4D was developed by Hughes and the USAF by fitting the infra-red seeker head of the AIM-4G into the smaller AIM-4C body. AIM-4D is designed for tactical air-to-air combat—launch in high-g turns against a small, manoeuvring, approaching target. The missile is licence-built by Saab as the Rb28, with Bofors motor and warhead, and Saab and Svenska Radio components.
AIM-4F/G Super Falcons entered service in 1960; AIM-4F (semi-active) has improved radar guidance and increased immunity to ECM, and AIM-4G (infrared) has an improved IR head. Both types have higher launch speeds, longer range, greater combat ceiling and more powerful warheads than their predecessors.

AIM-26A Nuclear Falcon and AIM-26B (HM-55, Kb27) AIM-
26A, introduced in 1960, has a nuclear warhead. AIM-26B (HM-55) is the conventional-warhead version and is licence-built by Saab as the Rb27.
AIM-47A A long-range version developed for the YF-12A. Operators AIM-4D: US Air National Guard (F-I01B, F-102A), Royal Swedish Air Force (Rb28—J35F Draken, AJ37 Viggen), Finnish Air Force (Rb28—J35S Draken), Canadian Armed Forces (CF-101B); AIM-4F/G: USAF Air Defence Command (F-106, mixed load); AIM-26A: US Air National Guard (F-102A); AIM-26B: as AIM-26A, plus Swiss Air Force (HM-55 — Mirage HIS), Royal Swedish Air Force (Rb28—J35FDraken), Finnish Air Force (Rb27—J35S Draken), Japanese Air Self-Defence Force (F4EJ).

Raytheon AIM-7E/F Sparrow HI In addition to its use in the air-to-air role Sparrow is found in both land-launched and shipborne surface-to-air systems (section 8). The weapon has been produced in a number of variants since it entered service in 1958, the most recent being listed below:
AIM-7E Saw extensive use in Vietnam as 7E and 7E2 and is the standard operational version. Will be succeeded by 7F. AIM-7F A version with greater range, lethality and reliability than its predecessors, being the result of lessons learnt with earlier models in Vietnam. Development problems have now been overcome and the first batch was bought with Fiscal 75 money. Operational Test firings last year showed that the solid-state 7F has significantly better performance and reliability than previous models.
The requests for Fiscal 76 and the transition budget include $156 million to buy 360 missiles for the US Navy and Marine Corps, 620 for the USAF and for development of a new seeker. The Fiscal 77 request is for another 700 USN/USMC rounds, 880 USAF missiles and continued seeker development. The new seeker would be cheaper than the present one and would have better discrimination against ground clutter plus improved ECM resistance. If development is successful the new seeker will be incorporated in the production line.

Operators AIM-7E—US Air Force, US Navy, US Marine Corps, Greek Air Force, Israeli Air Force, Imperial Iranian Air Force, Spanish Air Force, Korean Air Force, Japanese Air Self-Defence Force, German Air Force, Royal Air Force, Royal Navy (all F-4), Italian Air Force (F-104S), Turkish Air Force (F-4 and F-104S); AIM-7F—US Air Force (F-4E, F-15), US Navy (F-14), Israeli Air Force (F-4E).

Naval Weapons Centre/Raytheon/Aeronutronic Ford/Moto-rola AIM-9 Sidewinder The West's most widely used air-to-air missile, Sidewinder is likely to remain in production for a number of years despite criticism of its performance and the efforts of the US and other countries to find a satisfactory replacement.

Aeronutronic Ford AIM-9A (Sidewinder 1) Original variant, now superseded.
Aeronutronic Ford AIM-9B (Sidewinder 1A) More than 80,000 9Bs were built at a cost of some $3,000 each, but they were reasonably effective only against non-manoeuvring, bomber-type targets. The US Navy subsequently developed the second-generation 9D/G/H series and then the third-generation 9L, which is being produced as a joint USN/USAF venture. The USAF converted 9Bs to 9E and 9J standard to improve the armament of its F^l-Cs and other Century Series fighters. AIM-9Bs were also manufactured by Bodenseewerk in Germany for European countries, and that company de-veloped the FGW Mod 2 improved guidance-and-control unit which has been retrofitted to missiles in service; modified models are designated AIM-9F.

Motorola AIM-9C (Sidewinder IB) Used semi-active radar guidance rather than the infra-red homing of all other models. Developed as an all-weather missile for the F-8 Crusader, but no longer operational.
Aeronutronic Ford/Raytheon AIM-9D (Sidewinder 1C) Developed by the US Navy from 9B. The USAF originally intended to' arm all its F-4s with the USN's 9D, but develop-ment problems caused production delays to such an extent that it was necessary to arm the F-4D with Hughes' AIM-4D Falcon (see above), which was already in production for the USAF Air Defence Command. Thus the AIM-4D became the Air Force's primary infra-red missile and was subse-quently used on the F-4E as well. The AIM-4D has since been replaced by the AIM-9E and 9J, having proved ineffective in combat.

Aeronutronic Ford AIM-9E Modified from 9B for the USAF, low-level performance being improved. The alterations proved to be very cost-effective, resulting in a substantial performance improvement at a low price and requiring no alterations to aircraft launchers or support equipment. AIM-9E is, with 9J, standard armament for all USAF fighters and will remain in service into the 1980s because of a slippage in 9L schedules. Aeronutronic Ford/Bodenseewerk AIM-9F A modified version
of 9B fitted with the new FGW Mod 2 guidance-and-control unit.

Raytheon AIM-9G The second in the 9D/G/H series developed from 9B, AIM-9G has Seam. (Sidewinder expanded acquisition mode) for improved lead-collision guidance.
Aeronutronic Ford/Raytheon AIM-9H The latest variant to enter service with the US Navy. Basically a solid-state version of 9G, with improved reliability and maintainability, decreased minimum range, faster angle-tracking rates, increased lethality and an off-boresight acquisition and launch capability. US Navy Sidewinders have cryogenic sensor cooling using a high-pressure air bottle mounted in the launcher and tied into the missile via a belt. AIM-9H has an expanding-rod warhead which is optimised for a high-altitude shot. The last Navy 9Hs were funded in Fiscal 75 and the USAF is buying a once-only batch in Fiscal 76.
Aeronutronic Ford AIM-9J An AIM-9B can be converted to
9J standard for about $7,000; 9J is, with 9E, standard armament for all USAF fighters and will remain in service in-to the 1980s. The 9J, like the 9E, retains some tube technology, whereas the Navy's 9H is all solid-state. The USAF is, however, working on solid-state guidance for 9J, making it very similar to 9H. Other modifications being studied include using a modified AIF-9L fuze to provide all-aspect capability against an afterburning target, and regaining the Thiokol Mk 17 motor to increase the present less than 9,000Ib-sec impulse to something approaching the 13,000-13,5001b-sec of the Rocket-dyne Mk 36 motor in the 9H.

The 9J has a fast-acting servo which means that the weapon can respond to manoeuvre commands in about half the time that 9H takes; this, together with the fact that the Air Force missile is 301b lighter than the Navy one, gives the 9J a much smaller turning radius. AIM-9J continues to use the 9B's blast-fragmentation warhead.
Naval Weapons Centre AIM-9L Initial Operational Test and Evaluation (IOT&E) of this joint USAF/USN third-generation weapon is due for completion this summer and procurement is planned for Fiscal 76; $114 million has been requested in Fiscal 76 and the transition budget for completion of develop-ment, initiation of a product-improvement programme and purchase of 800 missiles for the USN/USMC plus 710 for the USAF. The Fiscal 77 request of $69 million is for continued product improvement and to buy 750 rounds for the USN/USMC plus 1,000 for the USAF.

AIM-9L has been improved yet further from 9H, with an annular blast-fragmentation warhead replacing the con-tinuous-rod type, an active optical fuze, double-delta fins for improved manoeuvrability and a new guidance system which, for the first time in the Sidewinder family, allows targets to be attacked from all angle®. The detector is cooled by an on-board air bottle. Motor, wings and rollerons are, however, identical with those of 9H.