

An F-14 Tomcat fighter jet is shown from a low-angle perspective, flying upwards against a blue sky with scattered white clouds. The aircraft is heavily armed with multiple air-to-air missiles mounted on its canards and underwing pylons. The text is overlaid in a bold, italicized white font.

F-14 Tomcat

***Advanced Air To Air
Missiles***

For DCS: World



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How This Mod Came To Be

The story started with two YouTube videos from Growling Sidewinder's channel, in which he was flying the DCS F-14B Tomcat modded to carry AIM-120 AMRAAMs and AIM-9X Sidewinders, and the DCS F-15C Eagle modded to carry Meteor and IRIS-T missiles. These videos reminded me of the US Navy's ACIMD and Advanced Air To Air Missile projects of the late 1980s. These programs sought to develop a replacement long range missile for the AIM-54 Phoenix, and the missile designs developed under these programs were very interesting and unique. It wasn't long before I decided to try making a mod of these missiles for DCS World and began making 3D models of the missiles. Eventually I got in contact with currenthill, who was interested enough in the project to help me make it a reality. Without his texturing and coding expertise, this mod would not have been possible. What we have created for the F-14 is not completely accurate to the AAAM program, but we feel it is close enough given the limitations of DCS that we have to work with. We hope you enjoy the upgrade that this mod makes to the F-14's arsenal, now go splash some bombers!

-Spino

A Brief History of the AIM-152 AAAM Program

In the late 1980s, the US Navy was looking for a new long range missile to go along with the latest and greatest version of the F-14 Tomcat - the F-14D. The existing AIM-54 Phoenix missile had adequate performance, but it also had shortcomings that were all too apparent. The AIM-54 was ludicrously expensive at roughly one million dollars per shot, and with its special launchers for the F-14, the missile system weighed roughly 2000 pounds. The incredible weight of the AIM-54 and its launcher meant that the F-14 could not land on aircraft carriers with more than four AIM-54s, and even the US Navy couldn't stomach the idea of jettisoning million-dollar missiles into the sea every time an F-14 came back from a BARCAP mission. Thus the Advanced Air To Air Missile program was born. The requirements for the new missile were very ambitious - it would have to have increased range compared to the Phoenix, while being smaller, lighter, and less expensive. It would be designated AIM-152, with no name other than the acronym AAAM, for Advanced Air To Air Missile. Both missiles had to be roughly the same size as the existing AIM-7 Sparrow. Defense contractors Hughes and Raytheon joined forces on the project, as did General Dynamics and

Westinghouse. Both design teams submitted proposals for the new missile, and both designs were flight tested during the late '80s and early '90s.

During this time frame, Hughes and Raytheon were also producing improved variants of the AIM-7 Sparrow and developing the AIM-120 AMRAAM, respectively. Unsurprisingly, their design borrowed heavily from the AIM-7 and AIM-120. Externally the missile resembled a re-worked AIM-7 with a slender forebody and an intake for the missile's rather unconventional propulsion system - a ramjet. The guidance system was based on that of the AIM-54 and AIM-120 active radar and inertial guidance, with all-moving control surfaces at the rear of the missile and a pair of wings in the center, allowing the missile to 'fly' through turns instead of the less efficient sideslip maneuver used by most missiles to change course. The missile was 12 feet long and weighed roughly 660 pounds, and could fit on the same launchers as the AIM-7 Sparrow.

The GD/Westinghouse design presented a very different solution to the missile's requirements. Their design looked like a stretched SM-2 surface to air missile, with a booster motor and fixed fins at the rear of the main missile body. Directional control would be provided by thrust vectoring on both stages of the missile. To make life easier on the ordinance handling personnel, the missile would come pre-sealed in a launch tube, compatible with the

existing AIM-7 launchers as well as special triple launch racks that could be fitted to the F-14, allowing theoretical carriage of up to 18 missiles on a single aircraft. The GD missile was also 12 feet long, but the second stage of the missile was just 5.5 inches in diameter, making it smaller than the AIM-120 AMRAAM. The missile was to have a dual mode seeker for terminal homing, with active radar supplemented by infrared homing in case noise jamming confused the radar. Instead of receiving mid-course updates, first stage guidance would use time-shared semi-active radar homing, allowing multiple launch capability on multiple targets. For older aircraft, an Airborne Track Illuminator (ATI) pod would be carried on one station to provide the phased array radar needed for this guidance system.

Unfortunately due to the shrinking defense budget following the end of the Cold War and a former SecDef who is held in very low regard by fans of the F-14, the F-14D was canceled after just 55 airframes were built. For the AIM-152 program, this was the beginning of the end. Although it could be carried by other US Navy aircraft, the missile really needed the F-14D's APG-71 radar to take full advantage of its capabilities. With the selection of the F/A-18E/F Super Hornet to replace the F-14, and no more looming threat of Soviet bombers launching carrier-killing cruise missiles from hundreds of miles away, the AIM-152 had become a missile without a purpose. Testing

continued for two years after the cancelation of the F-14D before the program was finally halted in 1994.

Installation

OVGME Installation:

- 1. Drag and drop the "AIM-152 for F-14B" folder into your DCS mod repo for the DCS Root Folder.**
- 2. Enable it.**
- 3. Done!**

Manual Installation:

- 1. Throw the CoreMods folder into your DCS Root installation folder.**
- 2. Replace all files that you need.**
- 3. Done!**

The only way to uninstall the mod after a manual installation is to run the Repair DCS World utility.



AIM-152 Hughes/Raytheon (HRM)

This is as close to a US equivalent of the MBDA Meteor as there ever was.

The AIM-152 HRM is powered by a ramjet engine, and has a speed of Mach 3-3.5. The missile is guided just like an AIM-120 AMRAAM or AIM-54 Phoenix, with multiple launch capability in TWS mode. STT lock can be used for very long range shots against non-maneuvering targets as well as near-WVR situations. For TWS launch at long range against multiple targets, it is recommended that the launch aircraft be between 35,000 and 40,000ft MSL and 600-800 knots. The F-14 can carry 6 of these missiles on its existing AIM-7 launchers, so when all missiles are expended the Tomcat has maximum lift area available for maneuvering. Effective range is about 120nm. Known issues: the missile sideslips like all other AAMs in DCS instead of flying smoothly through turns as it would in real life.



AIM-152 GD/Westinghouse (GDW)

This is a very different way of solving the long-range, lightweight missile problem. Its two-stage design is reminiscent of the SM-2 surface to air missile. Recommended launch parameters are the same as those for the AIM-152 HRM. This missile has thrust vectoring on both stages, making it very maneuverable, and its small diameter allows the F-14 to carry up to 15 of them! This missile does have several historical inaccuracies due to limitations with DCS World.

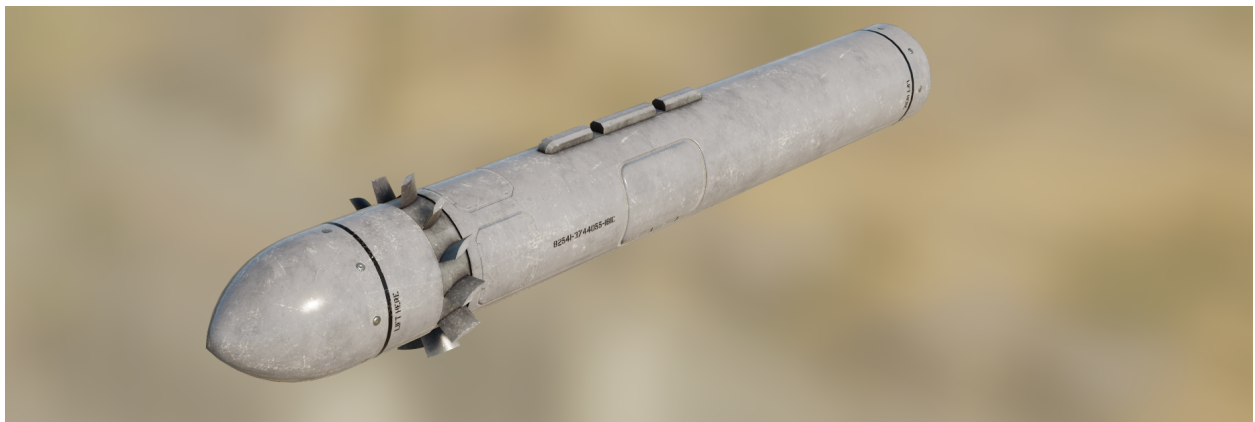
Known issues: the belly launchers are angled downward to allow the missiles to fire clear of the rest of the aircraft, but launches from the rear tubes clip into the forward launchers. In real life, the tubes were to be carried flush in special pallets and angled down for launching - since we don't own the F-14 model, this is not possible in DCS. The terminal guidance system is pure active radar just like the AIM-120 AMRAAM, since it is impossible to implement a dual mode seeker in DCS, and mid-course updates are received from the F-14's radar in TWS mode.



AIM-152 GD/Westinghouse Infrared (GDW-IR)

Since implementing the dual mode seeker of the GD/Westinghouse AIM-152 proved impossible, we decided to make a fictional variant of the missile with pure IR guidance. Employment is similar to the AIM-9 Sidewinder, STT lock a target to slave the seeker head to the radar lock, activate Sidewinder Expanded Acquisition Mode, and launch the missile at the tone. This missile presents an interesting problem to Tomcat pilots and other aircraft alike - it is kinematically capable of hitting targets 90nm away or farther, but the IR seeker has trouble locking onto targets farther away than 30 miles. Combined with thrust vectoring on both propulsion stages, this creates a missile that not only gives no launch warning to the target aircraft, but also has a no-escape zone almost as far as its maximum effective range! Balance isn't usually an issue in DCS World, since it simulates things realistically unlike arcade games such as War Thunder, but given the capabilities of this missile we decided that it needed balancing. Therefore the IR seeker of this

missile has reduced countermeasure rejection, (similar to AIM-9M vs AIM-9X), and only 3 of these missiles can be carried at one time. The capabilities of this missile open up the possibility of sneak attacks on unsuspecting targets by breaking the STT lock immediately after firing, or tracking a target using the TCS until the missile locks on and firing passively.



GDW Multifunction Airborne Track Illuminator

This pod is carried on the starboard wing glove pylon of the F-14 whenever either of the GD/Westinghouse missiles are loaded. In real life, this pod would have housed an advanced phased array radar for the time-shared SARH guidance of the GDW missile. In DCS it is essentially a dummy store that limits the maximum load of AIM-152 GDW missiles to 15 (yes, only 15), since it is impossible to model the phased array radar functionality, at least without the DCS SDK. The ram air turbine is not animated either, for the same reason.



Raytheon AIM-9X Sidewinder

Had the F-14D not been canceled, it probably would have been upgraded with the AIM-9X Sidewinder when that missile became operational in 2003. For this reason we have added the capability to carry the AIM-9X on stations 1A and 8A. Since the F-14B has no helmet mounted sight, it cannot take full advantage of the capabilities of the AIM-9X, but it is included all the same.

Credits:

3D modeling: Spino and currenthill

Texturing and coding: currenthill

Testing: Spino and currenthill