

Sneak Peek: “F/A-18 Hornet”

GSC's Upcoming Multi-Role Flight Combat Simulator.

Disclaimer: Screenshots and information presented in this article are based on a pre-release version of F/A-18 Hornet and therefore are subject to change. This article is not a review.

Introduction. In the early days, the sims that made it the Macintosh scene were poor indeed. Then in '91-'92 things finally started jumping. Apple decided it was time to start promoting Mac game development instead of discouraging it (Apple of course has a funny habit of changing their mind). Microsoft released Flight Sim 4.0, and Graphic Simulations Corporation (GSC), a small Richardson, Texas based company, released a new game called “Hellcats over the Pacific.”

Hellcats blew us away with us with its 256 color, 15 frame per second, 3D graphics, using a technique known as “Differential Scan Conversion ”(see Performance & Flight Dynamics). About a year later GSC released “Missions at Leyte Gulf,” a Hellcats-dependent mission disk with additional program enhancements. We finally got a simulator we could use... and use...and use. But the trouble with Hellcats was that it virtually made every other simulator on any platform look bad—it had the nasty side-effect of rendering all your other flight simulators boring and slow.

At MACWORLD San Francisco Apple's keynote address (the speech that was supposed to be hosted by Roger Heinan, the former vice-president of Apple's software division who defected to Microsoft) took place. Apple had demonstrations of their current new releases, their plans for future system software, etc. All the information including live Mac demonstrations, was displayed on two very large TV screens on a wall behind the podium. There was one other product demonstrated at this very high profile speech: two reps from Graphic Simulations went head to head in a new flight simulator, “F/A-18 Hornet.”

cheduled for release in March or April, Hornet will be a modern fighter simulation of the U.S. Navy's newest multi-role aircraft. It features network play for up to four players, fluid 20 frame per second graphics, a huge ordnance selection, and enough avionics to keep you reading the manual for a week.

Theater of Operation. The first theater to be released with the simulation will be the "Persian Gulf" area. This will include Kuwait, Iraq, Saudi Arabia, the Persian Gulf itself, and possibly Iran. The terrain is likely to be rather simple at first (we ARE talking about a desert environment here), with scattered sand dunes, palm trees and an occasional oasis and river. Unlike Hellcats 1.x, Hornet will maintain a modular mission approach allowing you to simply add new theater and mission files and call them up by selecting them from within the main application.

At this stage in its development, Hornet's Persian Gulf database is sparse. But expect to see carrier and night operations as well as conflicts over the desert skies.

Performance & Flight Dynamics. According to GSC, Hornet will use a completely new graphics engine that produces roughly 20 frames per second instead of Hellcat's 15. Both Hellcats and Hornet use a technique known as "Differential Scan Conversion" to refresh the screen. DFC is a technique whereby only those portions of the screen that change from frame to frame are actually re-drawn. It's the same type of technique used in games such as Velocity's Spectre™ and Apple's QuickTime™, however all the program code in Hornet is unique, and not based on Hellcats in any way. The simulation will have roughly a 30% performance increase over Hellcats.

There's been a lot of misconception about the use of the "Multi-Gen™" system in GSC's products. Multi-Gen™ is basically a 3D CAD system which produces 3D objects in much the same way as Swivel 3D™, StrataVision 3D™, or any 3D modeler. It has nothing to do with the code for the game. It's simply used to build the objects used in it.

Actual data supplied by McDonnell-Douglas (the real-world manufacturer of the F/A-18) is being used in the development of the simulation's flight dynamics. If that weren't enough to satisfy the hardened "simmer," an actual F/A-18 pilot visited GSC to help explain the radar modes and test the "feel" of the simulation. It apparently passed with flying colors.

Views. The view keys in Hornet are designed so that pressing a combination of two or more, will generate a "compound" view. For example, pressing the left, and rear view keys will let you see a 45 degree left/rear combination. This is a very ergonomic design and just the ticket for tense situations where SA (Situational Awareness) is of prime importance. The keys can be toggled between a "sticky" mode where they stay at the last view selected, or a "bounce back" mode where they go back to the forward view after you release them.

Avionics. I would call the cockpit in Hornet the best I have ever seen, but it would surely be pretentious of me to do so, since I am the one who designed it (I just had to get that out). I'll

simply let you judge for yourself as I explain the implemented (and planned implementations) of the actual avionics.

he screenshot above is a composite of the two cockpit modes in Hornet. (IMG apologizes for the small size and dithered colors, but obviously there are some limitations in publishing an electronic magazine.) The top section or “Head-Up” mode (not to be confused with “Heads-Up-Display” or HUD) includes everything from the top of the image to approximately the bottom of the top two multi-function displays (MFDs). By tapping a key, you switch to the bottom section—“Head- Down mode.” This mode cuts off everything above the instrument hood and displays everything from the top of the instrument hood on down.

Head-Up Mode. Naturally, the head-up mode is the primary view. Along with the out-the-window, 3D graphics, it contains all the vital information needed in combat and other high activity situations. This includes the HUD (Heads-Up-Display), left and right Multi-Function Displays (MFDs), and Up-Front panel (center located just under HUD). I might as well tell you that explaining all the modes of the HUD and MFDs in detail would be way beyond the scope of this article. Instead, I'll explain which modes are planned for implementation. If you're really curious as to their exact functions, I suggest you find a good book and look 'em up! All the following modes are planned implementations by the release date.

- HUD (Heads-up-Display). This displays the most vital information in the simulation: airspeed, altitude, heading, flight-ladder, target designator & aiming reticles, current G-forces, and weapon mode.
- Status Lights. Located just under the instrument hood to the right and left of the Up-Front-Control-Panel are a series of warning and status lights such as fire, master-caution, gear, flap, brake, arrestor hook and fluid systems.
- Top Left MFD. (ordnance status display.) Selecting different weapons will display information such as rounds remaining, and their hardpoint (wing pylon) locations. Other readouts include engine power, chaff, and flares.
- Top Right MFD. (Radar modes display).
Air-To-Air Modes: Velocity Search, Range While Search, Track While Scan, and Air Combat Maneuvering (aka Single Target Track).
Air-To-Ground modes: Real Beam Ground Mapping Mode, Sea Surface Search mode, Ground Moving Target Track mode, and Doppler Beam Sharpening mode.

Head Down Mode. The Head-Down-Mode will be used for less vital flight operations. All the upper instrumentation will still be visible except for the HUD. From left to right (starting under the circular yellow "Jett" button) the additional displays are as follows:

- Jettison Station Status Indicators (may or may not be functional).
- Engine Monitoring Panel. Displays fuel flow, nozzle position, oil PSI, and RPM. (All readouts on this panel are duplicated for each engine.)
- Fuel Status. Displays fuel quantity (not to be confused with fuel flow on the engine monitoring panel), and bingo status.
- Center MFD: Moving Map display.
- Analog instrumentation. Includes artificial horizon, knots, airspeed, and vertical speed indicators.

Weapons. Hornet is expected to have a massive selection of weapons available. As with the radar modes, explaining all the functions of each weapon is beyond the scope of this article.

Weapon selection is done by selecting ordnance from pop-up menus configured to mimic the actual layout of the pylons. After making your choice at each station, a small picture of the

ordnance is displayed along with its basic function, speed, and range.

The following is a list of stores which GSC has planned for implementation. As with other features they are subject to change:

- M61A1 Vulcan Cannon
- AIM-9L Sidewinder
- AIM-120A AMRAAM
- AGM-65E Maverick
- AGM-88A HARM
- AGM-62 DL (data link)
- BLU-107B Durandal
- CBU-59B Rockeye
- AGM-62 Walleye
- B-57 (tactical thermonuclear)
- Mk 82LD
- Mk 82HD
- Mk 82LGB Laser guided
- Mk 83LD
- Mk 83LGB Laser guided
- Mk 84LD
- Mk 84LGB Laser guided
- External Fuel Tank

The weapons will all have distinct 3D shapes and will be visible (at least on the outer wing pylons). For instance, launching a AIM-9 sidewinder and looking to the side and back will let you see the missile disengage from its mount, drop down a few feet, ignite, and screech off leaving a smoke trail.

Multi-Player Support. Up to four players will be able to simultaneously connect over AppleTalk networks for air-to-air combat and missions. For example, two players can be "red team", and two more can be "blue team" for a "furball" engagement.

According to GSC, it's unlikely that modem play will be supported in the first version. It's also unlikely that you'll be able to use AppleTalk Remote Access™ to emulate an actual network node.

[ummary](#). With high performance (20 frame per second) 3D graphics, modular mission structure, multi-player support, a barrage of weapons, and enough avionics to confuse a shuttle pilot, F/A-18 should change the way Mac developers look at game design. It's destined to set the standard for Macintosh flight simulators. If this were a review, and if Graphic Simulations were taking advance orders, I'd say put yours in now...

F/A-18 is due to be released in March. However, as with all new releases nothing is certain.

A very special thanks to Jeff Morgan and especially Trey Smith at Graphic Simulations for their patience and cooperation in allowing IMG the privilege of previewing Hornet.

-Jon A. Blum.