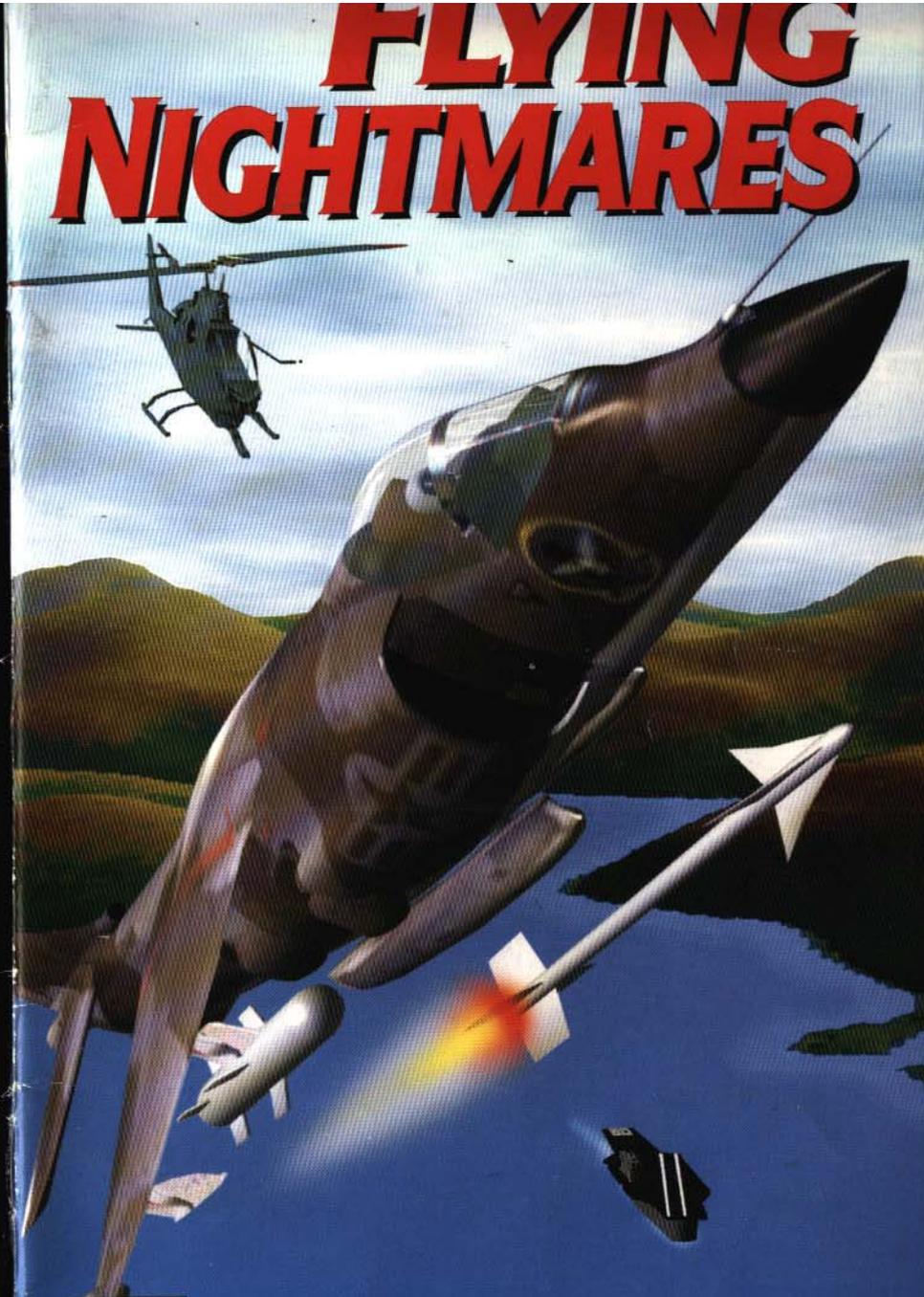


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Flying Nightmares

AV-8B Pilots Manual

TOP SECRET
FOR VMA-513
SQUADRON MEMBERS
ONLY

PREFACE

Welcome to the world of interactive simulation, and congratulations on choosing what we think is one of the best and most accurate flight simulators currently available. *FLYING NIGHTMARES* is the first flight sim for your 3DO Interactive Multiplayer™.

As a squadron pilot of the Rapid Deployment Force (RDF) you will participate in Operation Ocean Saber, an UN-authorized invasion of BARCALA in Southeast Asia. Tasked with landing US Marines in hostile terrain held by a well-armed and numerically-superior enemy, you'll fly the AV-8B Harrier 'Jump Jet' from the flight deck of the USS Tarawa, taking this revolutionary vertical take-off fighter into combat against the armed forces of BARCALA.

FLYING NIGHTMARES will place you in the role of a pilot in a naval task force consisting of amphibious assault ships, an escort of powerfully-armed warships, transport ships, landing craft, eight thousand troops, their vehicles, stores, helicopters, and a squadron of McDonnell Douglas AV-8B Harrier II aircraft.

Get the feel of what it's like to be part of a powerful naval force able to project US military power on distant shores. Feel the thrill of being the pilot of one of the world's most effective close air support aircraft. But remember, if you fail in either role, the prisoners of war being herded behind barbed wire to await the journey home will be wearing US uniforms.

Using expert systems technology built into the game, your 3DO will run the campaign, selecting the objectives of the land and sea forces, positioning the ships, and specifying the missions for the AV-8B Harriers leaving you free to enjoy flying a simulation whose flying characteristics and cockpit layout are closely modeled on those of the real aircraft.

The expert systems also control the actions of the enemy forces, who will respond to your decisions and tactics. This allows you to play the game many times, trying different methods of dealing with a large defending force.

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MANUAL OVERVIEW

The manual is divided into the following sections:

Campaign Overview.....page 4

The crisis in BARCALA and why the United Nations has authorized the US forces to intervene in this long-running conflict.

Quick Start.....page 5

A walk-through of a typical AV-8B mission. This section will get you into the air and flying combat missions as quickly as possible. It will also familiarize you with the general features of the simulation.

Starting Up.....page 8

Introduces the use of menu options, Campaign mode, Arcade mode and Training.

AV-8B Pilot's Manual.....page 10

This describes the AV-8B, its on-board electronic systems and weapons. You'll learn how to obtain pre-flight briefings and post-flight debriefings; how to select weapons, how to control and fly the aircraft; and how to use the aircraft's electronic systems to navigate and attack air and ground targets.

Flight Training.....page 22

The section describes the basics of flight controls and navigation, including waypoints and autopilot. For advanced pilots, it also describes the use of vectored thrust in flight.

Intelligence Brief.....page 26

Contains descriptions of the aircraft and weapons you're up against.

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TOP SECRET
THE WHITE HOUSE

CAMPAIGN OVERVIEW

Five months ago, a hard-line faction in BARCALA seized control of the country while senior members of the Government were visiting Japan to sign a long-term agreement covering trade and industrial co-operation between the two nations. Since then, the country has been run by a military junta.

Large-scale pro-democracy demonstrations in the streets of major towns were ruthlessly suppressed by armed soldiers. Estimates of the number of demonstrators killed by troops have ranged from 300 to over 1,500. Recent military communique from the junta talk openly of a "final and complete military solution" intended to end the rebellion. From its temporary exile in Japan, the legitimate Government of BARCALA has asked the United Nations to intervene to prevent the possibility of large-scale atrocities in the region.

The only military force in the area with the capability to intervene is an amphibious force of US Marines. Currently at sea and scheduled to begin Exercise Ocean Guardian, the small force is not a full-strength Marine Expeditionary Brigade, but has only a single vessel equipped with the AV-8B V/STOL Jet Fighter. Although some replacement aircraft are present on the decks of the other assault ships in the fleet, this force must make do with less than half the number of aircraft which would normally be assigned to a landing operation, and only a single flight deck from which to operate them: the assault ship USS Tarawa. As this small force cruises off the southern coast of Barcala, the United Nations discusses the crisis.

Following an all-night debate, the UN passes a resolution authorizing the United States to intervene. As the US President signs the orders which will translate the wishes of the UN into action, on Barcala it's a few hours until dawn. Aboard Tarawa, technicians give the vessel's AV-8B Harrier II fighters a final check over, while armourers fit fuses to bombs and missiles. In Tarawa and the other vessels of the task force, live ammunition is readied, and landing crafts are prepared for action. Aboard the escorting warships, guns and missile launchers are loaded with live rounds. Ocean Guardian is about to become Operation Saber.....

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QUICKSTART

CONTROLLING THE SIMULATION

Control Pad & Joystick

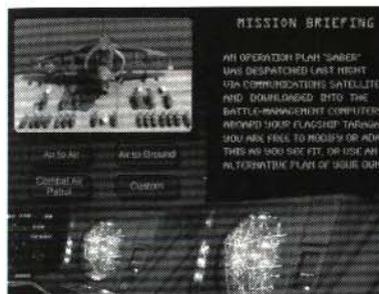
Flying Nightmares can be played using either a joystick or a control pad.

Menus

These are accessible-during the game by pressing the STOP button on your control pad. These change environment controls such as Music, Volume, Visual Detail and Mission Abort. Use the D-Pad to move Up/Down and Button A to select.

STARTING THE ACTION

Having chosen 'Combat' from the startup screen, you will now be placed in the Command Center of the USS Tarawa. From here you can select missions, arm your Harrier and receive mission briefings.



Move the cursor so that you are looking at the right hand bank of monitors (the screen will scroll automatically). This large projected computer display, shows the mission waiting to be flown. The first mission is an interdiction (ground attack) sortie to the eastern tip of BARCALA. This area has only light defenses, so its ideal for your first operational sortie. As you fly combat missions, you may hear the sound of explosions. These are the result of ground combat between the Marines and the Barcalan's. When the mission is completed you will be returned to the Command Center.

Pilots Briefing Monitor

Intelligence Briefing

The screen also contains the following information:

- The Primary and Secondary targets for your mission.
- The Flight Plan for this mission, including the waypoints.
- The defenses you are likely to encounter.

Aircraft Arming

The armourers will already have installed a suitable combination of ordnance for this mission. In later briefings you will learn how to customize your weapons load.

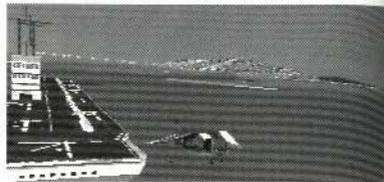
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FLYING THE MISSION

Takeoff

You are in the cockpit of your aircraft, with the engine running. Ahead of you is the flight deck of the Tarawa. Release the wheel brakes and then set thrust to maximum (96). When you reach the end of the deck, pull up the nose and retract the undercarriage.



KEYS USED

Wheel Brakes : Right SHIFT+Button B
 Increase Thrust : Left SHIFT+Pad UP (Joystick - THROTTLE)
 Nose Up : D-Pad DOWN (Joystick - Pull BACK)
 Gear Up : Right SHIFT + Button A

Fly to Target



Look down at your cockpit displays. These screens are called MFD's or Multi-Function Displays and can display a variety of information about the aircraft navigation, threat warning and missile systems. Your right hand MFD is showing the EHSI navigation display with waypoint 1 selected - this is your target. Cycle the scale so that the top right of the EHSI reads '7'. Turn the aircraft so that the line to this waypoint - the small cross at the end of the line - is vertical in the display. When the line shortens and the waypoint marker is about halfway between the outer edge of the display and the aircraft symbol at the centre, you are approaching the target and should be able to see it in the forward view.

KEYS USED

Cycle EHSI Scale : Left SHIFT + Button B

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Attacking the Target

Use Hydra unguided rockets to attack the target (See the Weapons section of your Pilots Manual for more information). Select Hydras by cycling through the available weapons - HYD followed by the type carried will appear at the bottom left of the HUD. A T shaped marker towards the centre of the HUD will appear, showing the predicted impact point of the rockets. Fly until this is visually over the targets and fire the rockets!



KEYS USED

Cycle Weapons : Button B
 Fire Weapon : Button A (Joystick - Fire Button)

Return to Tarawa



Cycle through the waypoints on the EHSI display, until a T is shown at the top right. This is a TACAN radio navigation aid carried by Tarawa as a navigation aid for its aircraft. Now select Autopilot, and sit back and watch it do the work of flying you back and landing the aircraft. This is the ideal time to experiment with the outside views available. You can speed things up by 3x by engaging Fast Time. Upon landing, you will be returned to the Tarawa Command Center and a summary of your mission will be displayed on the Pilots Briefing Screen.

KEYS USED

Cycle Waypoints : Left SHIFT + Button C
 Outside Views : Button PLAY

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STARTING UP

After the introductory sequence has played, you will be presented with this screen.

COMBAT

Click here to initiate a full campaign to defeat the rebel forces on Barcala Island. The campaign takes place over 3 days, with 36 missions. Early missions contain just one sortie, but by the end of the campaign, missions require 4 to 5 sorties. Your supply of Harriers is limited to 20 for the entire campaign, so you may find yourself re-flying missions to get the loss rate down.



ARCADE

If you want instant action or just to practice a difficult mission as part of the campaign, select Arcade. This will allow you to fly any of the missions in any sequence you like. Pilots earn points for each target destroyed, and points are deducted for each aircraft lost. Arcade mode is also easier to fly and is an excellent way to practice missions.

TRAINING

This activates the Harriers Part-Task Simulator, which is designed to allow beginners to practice the basics of flying in a closed environment. Choose from Take Off/Landing, Air to Air and Weapons practice.

LOAD GAME

This restores a previously saved game state. If you want to get straight back into the action, click here.

JOYSTICK

Analog joysticks need to be calibrated prior to use. As long as the trim pots are not moved, this does not need to be repeated, as the game automatically saves your initial settings. If you find that the aircraft rolls or pitches sharply when you are not holding the stick, click here and recalibrate the stick.

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COMMAND CENTER

Welcome to the heart of the USS Tarawa. From this nerve centre, all operations of Ocean Saber are directed. You can see the Command Console, behind which are some screens. Pushing the joystick/pad to the right or left will pan your view and reveal more of the room.



BRIEFING SCREEN

Click on the island to receive the latest briefing from the White House.

MISSION SCREEN

This is displayed pictorially above the Load/Save icons. In Arcade mode, players can choose which day of the campaign and which mission they wish to fly, allowing you to jump straight into the action. In Campaign mode, this will update the player on their progress.

Save Game

You will now see a screen containing 10 'Dogtags'. Your previously saved game is automatically highlighted. To select another Dogtag, press Button B to cancel, and move the cursor to the it and press Button A Use UP/DOWN on the D-Pad to select letters, and Button A to enter them. When you have entered your 'call sign' click Button C to save your mission status.

Load Game

To retrieve a previously saved game, click on the appropriate 'dogtag' and the mission will be restored automatically.



WEAPONS SCREEN

Click here to load the Harrier with the appropriate weapons for the current mission. See Arming the Harrier in your Pilot's Manual for details of custom weapons loads.

PILOTS BRIEFING SCREEN

Click here to fly the sortie displayed. This screen also contains the pre-flight briefing.

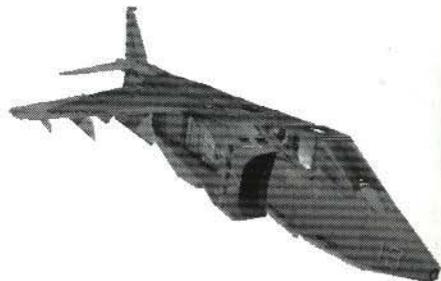
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AV-8B PILOT'S MANUAL

The McDonnell-Douglas/British Aerospace AV-8B Harrier II is the latest member of a unique family of vertical/short take-off fighter aircraft. Originally designed in Britain, and taken into service by that nation's Royal Air Force, Harrier was later adopted by the US Marine Corps as the AV-8A. A collaborative effort involving the US and UK finally resulted in today's much improved AV-8B.

At only 46ft 4in long and 30ft 4in in wingspan, Harrier is smaller than many present-day fighters, and closer in size to the General Dynamics F-16 Fighting Falcon than aircraft such as the McDonnell Douglas F-15 Eagle and F/A-18 Hornet.



Its most distinctive feature is that its single engine does not have a single jetpipe in the rear fuselage, but a total of four – two on either side of the center fuselage. A single cockpit control allows the pilot to move all four in unison through an angle of more than 90 degrees. Known as "thrust vectoring", this technique is used for vertical takeoff and landing, and hovering. It can also be used in combat to increase the aircraft agility – this is known as "viffing" (Vectoring In Forward Flight), and you'll learn how to do this later in this section of the manual.

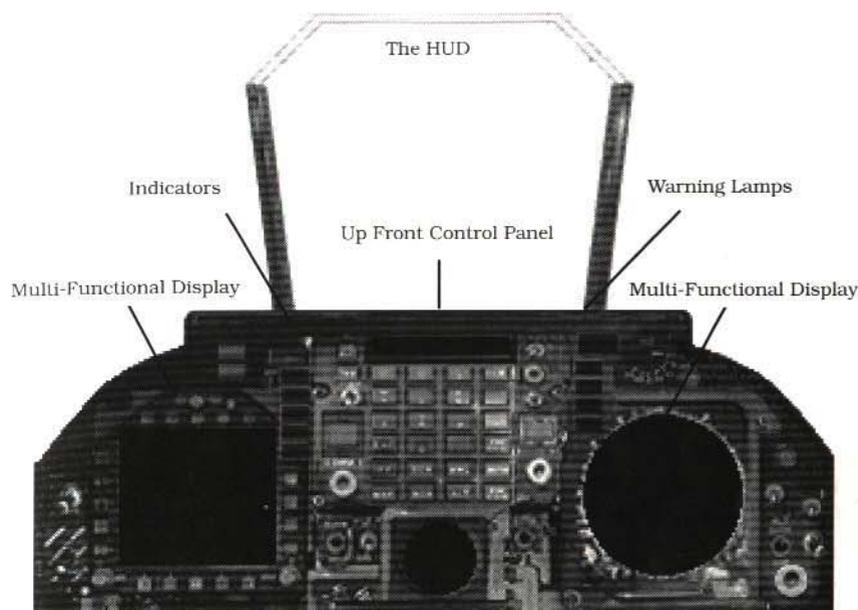
Afterburners would turn the four nozzles into runway-destroying blowtorches, so Harrier does not use this technique. All the thrust must be provided by normal engine power. The sheer size of the engine needed to provide the required amount of thrust gives the aircraft its relatively wide center fuselage and huge "elephant ears" air inlets, while the absence of an afterburner limits the aircraft to subsonic speeds. Maximum speed at sea level is around 575kts (Mach 0.87), rising to Mach 0.91 at altitude.

Tactical range – the distance the aircraft can fly, loiter for long enough to perform a useful military mission, then fly back to base – depends on the height at which you fly and the weight of weapons carried. A typical figure with a good bomb load would be around 480nm.

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THE AV-8B COCKPIT



The cockpit display in this simulation is a close replica of that in the real aircraft. We've made some minor modifications in order to improve the player's forward view, but apart from that, the basic layout of the cockpit would be familiar to any AV-8B pilot.

Like the simulation model itself, the cockpit is as realistic as possible while still being able to run on a 3DO. There are more accurate simulators, but they're classified, your annual salary wouldn't match the price tag, and you'd have to undergo a long interview at your nearest USMC recruiting office, the rigors of "boot camp", then a long training course before getting your hands on them.

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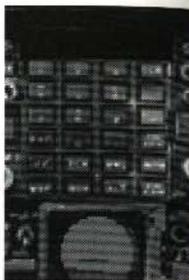
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FLIGHT INFORMATION

The pilot has six basic sources of information – the view through the canopy, the Head-Up Display (HUD), two Multi-Function Displays (MFDs) and a single Up Front Control Panel (UFCP).

UP FRONT CONTROL PANEL (UFCP)**Threat Bearing Indicator**

The airspace above BARCALA is continuously monitored by Boeing E-3 Sentry Airborne Early Warning and Control (AWACS). Threat bearings are indicated by the clock; 12 o'clock is straight ahead, 3 o'clock to the right, 9 o'clock to the left, and 6 o'clock behind. Targets marked H are above your altitude, so will probably be fighters. L indicates targets below you, and are probably helicopters. C-130 indicates enemy Hercules transports. AWACS data is updated every five seconds.

**Artificial Horizon**

The single bar on this instrument is the equivalent of the zero-degree pitch bar in the HUD. It remains parallel to the horizon, and moves up or down to indicate aircraft pitch.

WARNING LAMPS

A vertical column of warning lamps is mounted to the right of the Up-Front Display. The large FIRE indicator will light in the event of an engine fire. The others will illuminate if any of the following system fail:

FIRE _____
Hydraulics —
HUD _____
MFD _____
NAV _____



If the hydraulic system fails, your undercarriage and air brakes will be unable to move from their current positions. Break off the mission, return to Tarawa, and make the best landing you can. HUD, NAV and MFD failures will make effective attacks near-impossible, although the LFD in the HUD can be used as an impromptu sight for the cannon and unguided rockets.

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INDICATOR STRIP

A vertical column of five lamps is mounted to the left of the Up-Front Display. These show the status of several important sub-systems:

Missile Approach Warning

When light is on start dropping flares and chaffs as incoming missiles are about to hit.

Landing Gear

The main gears are in the lower fuselage, forward and aft of the engine, while two outriggers provide the stability needed to prevent the aircraft tipping over if the ship rolls heavily, or you make a bad landing. It should be raised after take-off to reduce drag. Failing to lower it on landing will send your aircraft to the hanger for extensive maintenance.

**Wheel Brakes**

Attempting the rolling takeoff without removing the brake may cause you to crash into the sea. If the takeoff roll seems slow, angle your nozzles to 50 degrees. The thrust from the downward-tilted engine nozzles will probably compensate for your low forward speed.

Air Brake

Extending the air brake increases drag, slowing the aircraft. This can be useful in combat, where it can reduce your speed – and thus your turning circle – in a dogfight, or in a diving attack. Remember to retract it when it's no longer needed!

Fuel

The amount of fuel left in the tanks is shown on an instrument panel indicator. Judging what will be the "Bingo" fuel state for the mission – the amount needed to get you back to the ship – is not easy. Keep an eye on how much fuel you have used to get to the initial target. Three times that amount is a reasonable "Bingo" value, leaving you a good margin for emergencies. Once the fuel state drops to "Bingo" level, head for Tarawa without further delay. Get this one wrong, and you'll be examining the Barcala Sea in close-up from the comfort of an inflatable dinghy.

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FOR VMA-513 SQUADRON MEMBERS ONLY

Multi-Function Displays

The cockpit includes two Multi-Function Displays. The left MFD displays either the Stores Display or ARBS. The right MFD shows the EHSI or Radar (Threat) Warning Indicator.

Stores Display

This shows the number and type of weapon available on each of the aircraft's underwing pylons, also the number of rounds of cannon ammunition, chaff cartridges and flares available for use. It also indicates which type of weapon is currently selected, and its salvo size, i.e. how many of the weapon will be released when the fire button is pressed.



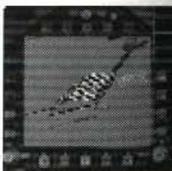
Radar Warning

Like the EHSI, this display is aircraft stabilized. Spoke-like lines appearing from the center towards the outer circles indicate that the radar detector has detected a radar transmission on that bearing. The length of the line indicates how close the threat radar is. A Missile Launch Warning detector will sound an alarm tone whenever a SAM or Air-to-Air missile is launched against your aircraft.



ARBS

This MFD mode is linked to the aircraft's nose-mounted Angle Rate Bombing System. This is a laser spot tracker linked with an imager. This camera shows an enhanced view of the target, which is especially useful for target re-acquisition.



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Electronic Horizontal Situation Indicator (EHSI)

The EHSI mode shows the aircraft in symbolic form, surrounded by a compass rose. This display is centered about the aircraft. The top of the screen always represents the direction directly ahead of the aircraft. As the aircraft turns, the compass rose moves to the correct orientation. When a waypoint is selected, the EHSI displays this as a small cross, and draws a steering line whose angle indicates the direction to steer, and whose length indicates the distance to be flown.



The scale of the EHSI display can be cycled, so that the distance from the center of the display to the compass rose is 7, 15, 30 or 60 nautical miles. The other type of marker is a cluster of three dots. Each cluster represents a waypoint currently within the EHSI range setting.

Before takeoff, a series of waypoints (see Flight Training for more details on Waypoints) are automatically stored in the aircraft's NAV system, details of which are displayed on the Pilots Briefing Screen. The system can store up to 8 waypoints (1-8), also a waypoint T (the TACAN beacon on Tarawa), and a waypoint 0. The Pilot can toggle through waypoints during flight on his NAV system. The waypoint in use is indicated at the top right corner of the EHSI. Selecting waypoint T at any time allows the pilot to find his way back to the ship.

Waypoint 0 is used to mark targets of opportunity - a target you have not been briefed on, but noticed during the flight to your scheduled target. This is inserted into the NAV system by pointing the HUD LFD at it and 'marking' the target. If you have weapons left after knocking out your assigned target, select waypoint 0, and let the Nav system fly you back to this target. To help you re-acquire the target, its position on the ground is marked by a cross in the HUD field of view.

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Head Up Display (HUD)

The primary source of information for the pilot is the Head-Up Display (HUD), a reflective surface mounted straight ahead. All the flight, navigation, target and weapon-aiming information needed to carry out a combat mission is projected here.

Airspeed

The box at the upper left of the HUD shows airspeed in knots.

G Force

The airframe can accept more G force than the pilot. At more than around 9 g, pilots experience "grey out" as the G force drains blood from his head and upper torso. This initially causes a dimming of vision, followed by loss of consciousness (GLOC). Pushing the control column sharply forward can have the opposite effect, pushing blood from the pilot's torso to his head causing "red out".

LFD

Directly in the center of the HUD, the Longitudinal Fuselage Datum (LFD) shows the direction in which the aircraft nose is pointing. This is a fixed mark. If the HUD fails during a combat mission, the LFD could be used as a simple sight for the cannon or unguided rockets, but the pilot will have to aim high to compensate for the ballistic drop of the projectiles caused by gravity.

AOA (Angle of Attack)

This shows the angle between the fore-and-aft axis of the wing (an imaginary line drawn between the wing leading and trailing edges) and airflow across the wing caused by the aircraft's forward velocity. Increasing the AOA by a small amount increases the amount of lift generated by the wing. Take this process too far, and the wing stalls - typically at an AOA of around 20 degrees.

Weapon Type

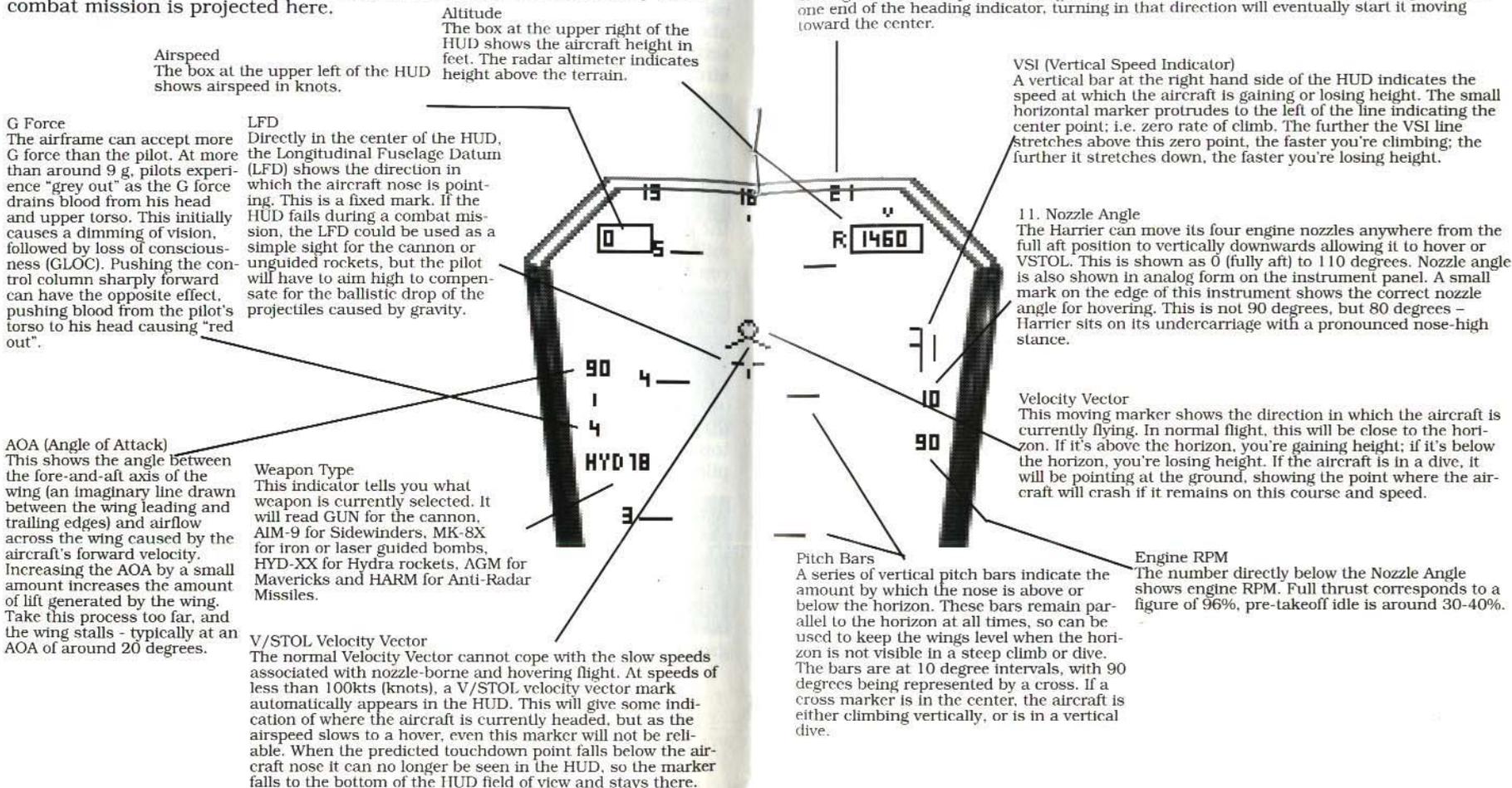
This indicator tells you what weapon is currently selected. It will read GUN for the cannon, AIM-9 for Sidewinders, MK-8X for iron or laser guided bombs, HYD-XX for Hydra rockets, AGM for Mavericks and HARM for Anti-Radar Missiles.

V/STOL Velocity Vector

The normal Velocity Vector cannot cope with the slow speeds associated with nozzle-borne and hovering flight. At speeds of less than 100kts (knots), a V/STOL velocity vector mark automatically appears in the HUD. This will give some indication of where the aircraft is currently headed, but as the airspeed slows to a hover, even this marker will not be reliable. When the predicted touchdown point falls below the aircraft nose it can no longer be seen in the HUD, so the marker falls to the bottom of the HUD field of view and stays there.

Altitude

The box at the upper right of the HUD shows the aircraft height in feet. The radar altimeter indicates height above the terrain.



Heading

A horizontal band running across the top of the HUD shows the current heading in tens of degrees. 00 is north, 09 is east, 18 is south and 27 is west. The direction in which you're flying is indicated by a small vertical tick below the heading display. A V-shaped steering cue visible above the heading display is linked to the aircraft NAV system. It indicates the direction you must steer to reach the next navigation waypoint or target. This gives no indication of range, and can only indicate angles within the HUD field of view. If the steering cue is at one end of the heading indicator, turning in that direction will eventually start it moving toward the center.

VSI (Vertical Speed Indicator)

A vertical bar at the right hand side of the HUD indicates the speed at which the aircraft is gaining or losing height. The small horizontal marker protrudes to the left of the line indicating the center point; i.e. zero rate of climb. The further the VSI line stretches above this zero point, the faster you're climbing; the further it stretches down, the faster you're losing height.

11. Nozzle Angle

The Harrier can move its four engine nozzles anywhere from the full aft position to vertically downwards allowing it to hover or VSTOL. This is shown as 0 (fully aft) to 110 degrees. Nozzle angle is also shown in analog form on the instrument panel. A small mark on the edge of this instrument shows the correct nozzle angle for hovering. This is not 90 degrees, but 80 degrees - Harrier sits on its undercarriage with a pronounced nose-high stance.

Velocity Vector

This moving marker shows the direction in which the aircraft is currently flying. In normal flight, this will be close to the horizon. If it's above the horizon, you're gaining height; if it's below the horizon, you're losing height. If the aircraft is in a dive, it will be pointing at the ground, showing the point where the aircraft will crash if it remains on this course and speed.

Pitch Bars

A series of vertical pitch bars indicate the amount by which the nose is above or below the horizon. These bars remain parallel to the horizon at all times, so can be used to keep the wings level when the horizon is not visible in a steep climb or dive. The bars are at 10 degree intervals, with 90 degrees being represented by a cross. If a cross marker is in the center, the aircraft is either climbing vertically, or is in a vertical dive.

Engine RPM

The number directly below the Nozzle Angle shows engine RPM. Full thrust corresponds to a figure of 96%, pre-takeoff idle is around 30-40%.

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PRE-FLIGHT OPERATING PROCEDURE

From: Squadron Commander VMA-513
 To: All pilots
 Subject: NAV waypoints

Before leaving the briefing room to begin a mission, take care to note the identity of every waypoint programmed into your aircraft's NAV system. Once over Barcala, you'll be busy enough without the added workload of trying to remember the purpose of each waypoint. Time moves fast when you're flying at low level at a speed of more than 500kts. Time wasted struggling with waypoint selection is time in which a fighter, SAM or AAA battery can get a shot at you.

The currently available mission is displayed on the large projected computer screen at the left of the Command Center. This lists the primary target, any secondary targets, and their programmed waypoints. An intelligence briefing will also be given, listing the anti-aircraft ground defenses at these targets, and the risk to being intercepted by enemy fighters.

POST-FLIGHT DEBRIEFING

On landing from a successful sortie, you will be returned to the Pilots Briefing Screen. De-briefing information will be displayed on the screen. Once you've read, this clicking on the screen will bring up the next sortie or if you have been unsuccessful, give you the chance to fly the sortie again.



If you have completed all the objectives of the current mission, you will receive a commendation from the commander, and the campaign against the Barcalan's will move onto the next phase. You can check your progress by clicking on the Mission Screen.

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MISSION BRIEFING

As an AV-8B pilot, you can be tasked with three types of mission during Operation Ocean Saber;

Close Air Support

- Objective : To provide fire support for US forces in direct conflict with Barcalan units. Some targets will be laser designated by the ground forces, allowing pilot to use Maverick missiles and laser-guided bombs.
- Waypoints : Automatically programmed into the aircraft's NAV system. Targets will be described in the mission briefing, and TAWADS will automatically set waypoints over the targets to be attacked.
- Default weapons: Unguided Bombs, Laser guided bombs; Maverick; cannon.

Interdiction

- Objective : The destruction of one or more targets well behind enemy lines. Targets will not be laser designated, so must be attacked using unguided bombs and rockets.
- Waypoints : Targets will be described in the mission briefing, and TAWADS will automatically set waypoints over the targets to be attacked.
- Default weapons: Unguided rockets; unguided bombs; Rockeye, Sidewinder; cannon.

Air Interception

- Objective : Engage and destroy enemy aircraft.
- Waypoints : Automatically programmed into the aircraft's NAV system by TAWADS. Waypoints will be placed at last known location of enemy planes.
- Default weapons: Sidewinder; cannon; countermeasures.

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FOR VMA-513 SQUADRON MEMBERS ONLY

ARMING THE HARRIER

Once you've been briefed on the mission, you may wish to modify your weapons load. To do this, click on the customize weapons button.

Weapons are mounted beneath the wings on racks called 'Pylons'. Heavier weapons can only be carried on inner pylons. Lighter weapons can be mounted two or even three per pylon. The armorers will take care of pylon loading and weight balancing automatically.

To install or remove a weapon of your own choice, first select it by clicking on its button. It will appear in the window at the top of the screen. Beneath this window, the maximum carryable number of this weapon is displayed, along with the current load. The maximum may change if you choose to remove another type of weapon. To load this weapon onto the aircraft, press Button A. To unload this weapon, press Button C.



While the armorers were loading and fuzing your chosen weapons, other members of the flight deck crew were busy fuelling your aircraft, and recharging its oxygen system. To begin the mission, click on the Harrier picture to return to the Command Center. Now click on the Pilots Briefing Screen. This will put you in the cockpit, and start the aircraft's engine.

SELECTING AND USING WEAPONS

Once airborne and on the way to the first waypoint, it's time to select weapons. Pressing Button B cycles through the weapons available. The Stores Display on one of your MFDs will show the selected pylons, and the numbers of weapons on each. Alphanumeric at the bottom left of the HUD will show the type of weapon selected, and the number to be released in the salvo. This information is duplicated on the MFD Stores Display.

During the pilot's briefing, you'll sometimes be warned that fighters are expected. You may wish to carry extra Sidewinders, especially if F-16's are reported. On the way to and from the target area, choosing GUN or AIM-9M will ensure that you're ready to fight back if enemy aircraft try to intercept you.

Use the fire button or Button A to release weapons. When a multi-round salvo has been selected, a single press will release all the weapons in that salvo. Rockets fire with an interval of 0.2 seconds between rounds, bombs at 0.4 second intervals. After releasing weapons, the fire button/Button A control is inactive for 0.5 second, 0.1 second in the case of the cannon.

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DEFENSIVE WEAPONS

ALQ-164

Carrying an ALQ-164 jamming pod will reduce the range at which enemy radars will detect your aircraft. This will make it difficult – but not impossible – for SAM batteries to launch radar-guided missiles at your aircraft. Carrying a jamming pod reduces your chances of being shot down by a radar-guided missile, but takes up a valuable pylon, reducing the weapon load you can carry.



Chaff and Flares

Within the fuselage of the aircraft are dispensers for chaff and flares. The numbers remaining for use are shown on the weapons display on the right-hand MFD. These are released simultaneously. When released, a chaff cartridge bursts to release a cloud of fine strands of metallized glass fiber. These form a radar-reflective false target which can confuse a hostile radar. If attempting to lock onto your aircraft, the radar may instead lock onto the chaff cloud. If already locked on, it may "break lock", following the slow moving chaff cloud rather than the fast-moving aircraft. If a radar-guided SAM has been fired at your aircraft, dropping a chaff cartridge offers it an alternative target. Sidewinders are heat-seeking missiles, which home onto heat radiated by your aircraft. Flares are fast-burning devices which offer the missile an intense heat source which may distract it from your aircraft.

ORDNANCE

Cannon

The aircraft's 25mm cannon is aimed using the velocity vector marker in the HUD. The gun has 300 rounds of ammunition, and the number remaining is shown in the Stores Display screen on the MFD display.

Iron Bombs & Rocket

Iron bombs are aimed by means of the Continuously-Computed Impact Point (CCIP) mode. As its name suggests, during a CCIP attack, the aircraft's NAV system is continuously computing the point where the bombs would land if released now, and marks this in the HUD with a small cross-shaped aiming mark. A line is automatically drawn between this CCIP marker and the LFD.



When dive bombing, the CCIP marker will be easily visible in the HUD field of view. If you fly a horizontal attack at low level, you'll have to fly fast to keep the CCIP marker in the HUD field of view. In practice, AV-8B pilots normally keep the speed to 450kts or more when making CCIP attacks from low level. Rockettes consist of hundreds of 2lb bomblets and are therefore particularly effective against columns of enemy vehicles due to their wide impact range.

Unguided Rockets

Rockets are launched in CCIP mode. In this case the HUD does not show a CCIP line – only a "T"-shaped CCIP aiming mark, which 'floats' beneath the LFD, showing the predicted impact point. With a little aiming practice, you will find Hydra's are a very effective weapon against fixed artillery and enemy installations.



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AGM-65E Maverick

Maverick is designed to home onto targets which have been laser-designated by friendly forces. If Maverick is selected, and a target is being designated by ground forces, a square marker will appear in the HUD as you approach the target area. Maverick can then be fired and will home automatically without further action by the pilot.



Firing a Maverick does not automatically result in a "kill". For instance, you may have fired at too great a range. Missile homing systems are not perfect. During trials in the late 1970s, half the Maverick rounds fired landed within four feet of the target. The others exhibited greater errors, in some cases 10 feet or more. All guided missiles exhibit such variations in accuracy between individual rounds, and in some cases may not land close enough to score a "kill". In Flying Nightmares, missile behavior has been accurately modeled to reflect such small errors. If firing a guided missile doesn't result in a kill, try making a second pass.

Laser-Guided Bombs (LGBs)

Like Maverick, LGBs are laser-homing weapons which require their target to be designated. Operating procedure is similar to that for Maverick, but these weapons have less range and maneuvering capability than the AGM-65. LGBs must be dropped close enough to the target to allow their limited maneuvering power to successfully guide the weapon to a "kill". It is essential that the CCIP line be positioned inside the square marker when the bomb is released.

**AIM-9M Sidewinder**

Selecting AIM-9 will automatically activate the Infra-Red seeker of the Sidewinder missile. This will scan an area ahead of the aircraft, looking for a suitable air target. Any target aircraft visible through the HUD will be in the Sidewinder's field of view, and the missile will lock on automatically. If several aircraft are visible, Sidewinder will lock onto the nearest target.



You will receive two indications of successful lock-on. A circular mark in the HUD will track the target, and you will hear a "growling" tone generated by the missile seeker head. The missile can then be fired, and will home automatically. If the seeker has not locked onto a target, the missile can still be launched, but it will not home. Sidewinders are most effective at ranges below 4,000 meters.

NOTE : AIM-9M will not work on Barcalan C-130's. Use the cannon to attack these.

AGM-88 HARM

To attack a radar-guided SAM site, turn your aircraft onto the threat bearing indicated by the radar-warning receiver. Once the radar is within the HUD field of view, a square aiming mark will be visible. This will track the target, indicating that the missile has locked on. Firing at too great a range can fail to generate a "kill", either because the missile did not have enough range to reach the target, or because the radar has been switched off. (The latter tactic is a good counter to HARM: it deprives the missile of its ability to make further course corrections.) Launching the missile at closer range will reduce the enemy's chances of switching off in time, but if misjudged could give him the chance to fire a SAM at you.

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FLIGHT TRAINING

The main flight control of any modern fixed-wing aircraft is the control column or "joystick", so the easiest way to control the AV-8B simulation is with an analog joystick. Just as in a real aircraft, forward movement of the joystick moves the nose of the aircraft down, putting the aircraft into a dive, while backward movement raises the nose, putting the aircraft into a climb. Moving the joystick to the right rolls the aircraft to the right, while movement to the left rolls the aircraft left.

A joystick needs to be calibrated before playing the game. This usually needs to be done only once, as the settings are saved along with your pilot information. Should the rotary trim pots get moved however, you may find it necessary to re-calibrate the stick.

The other method of simulating a control column is to use the D-Pad. Once again, the trick is to imagine these as moving the tip on an imaginary control column. The Up button will push the aircraft nose down, while the Down button pulls it up. The Right and Left buttons command the aircraft to roll. This works well if you wish to play Flying Nightmares as an action game. However if you wish to explore the intricacies of the flight model, you really need a good joystick. If you don't own one, the advanced aircraft model in Flying Nightmares is the best excuse we can think for investing in one.

The other significant flight controls are the rudder and trim. In flight, rudder is used to make small horizontal aiming corrections, or to final heading corrections when landing. In the hover, it turns the aircraft by operating the yaw reaction jets, and on the ground, it steers the aircraft via its nosewheel. Pitch trim alters the horizontal alignment of the aircraft, this is particularly useful for strafing.

WAYPOINTS

An essential concept throughout the simulation is the use of waypoints. A waypoint is simply a geographic location at which some sort of action must be taken when you get there. For example : "Drive south along Main St, turn left at the first stop light, carry straight on past the school and the pizza joint is on the left, directly opposite the library. Buy six pizzas, then go back up the street, go left and watch for Joe's Computer Store on the right. Wait behind Joe's until the rest of us show up."

The stop light, school, and store are waypoints in a play which will eventually see six pizzas delivered to a bunch of hungry guys in the parking lot. To fulfil the mission, your friend had to go from one waypoint to another, changing direction or following other instructions ("buy pizza" or "wait") as he reached one.

In Flying Nightmares, you'll use waypoints to navigate your aircraft. Instead of sending your friend to the pizza joint waypoint to buy pizza, you might launch your Harrier to attack Lore then Tutuala and then return to the Tarawa. For your mission, Lore, Tutuala, and Tarawa will be waypoints programmed into the Harrier's NAV system.

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THE USE OF VECTORED THRUST

Whether this is your first flight-simulation purchase or the latest of many, you must learn to cope with the aircraft's unique system of vectored nozzles. To help you, the following flight procedures describe how to use this capability. Most are based on flight procedures contained in the official Harrier manual.

Vertical Take-Off

This can only be flown with light weapon loads. Maximum take-off weight (shown on the right center of the Weapon Loading Screen) must not exceed the maximum engine thrust of 23,800lb.

1. Set the nozzles to 80 degrees, then select full engine power.
2. At a height of 50ft, move the nozzles slowly backwards.
3. At a forward speed of around 180kts, the wings will generate enough lift to support the aircraft.

Rolling Take-Off

1. Set the engine nozzles to between 40 and 50 degrees, depending on aircraft weight. The heavier the aircraft, the greater the angle should be.
2. Remove the wheelbrakes, and select full engine power.
3. Apply a slight back pressure on the controls as the aircraft leaves the deck, then hold the nose just above the horizontal.
4. When the aircraft reaches a forward speed of more than 180kts, raise the undercarriage and the engine nozzles.

Tarawa's flight deck is long enough to allow a take-off with the nozzles left fully aft. You will lose around 20ft of height in the first few seconds of flight, so keep the nose above the horizontal until the aircraft has regained height.

Short Rolling Take-Off

This is the procedure used to minimize takeoff run when operating out of very short land strips. You won't need to use it in the game; it has been included here for your interest. Try to get airborne in the shortest possible distance while carrying a heavy weapon load.

1. Remove the wheelbrakes, and select full engine power.
2. As the aircraft approaches the end of the flight deck, set the nozzles to 50 degrees.
3. When clear of ground ground, hold the nose just above the horizontal.
4. At a height of 50ft, move the nozzles slowly backwards.
5. At a forward speed of around 180kts, the wings will generate enough lift to support the aircraft.

Returning to the Hover

1. Jettison all unused weapons
2. Set the nozzles to 20 degrees.
3. Increase the nozzle angle to 40 degrees as you approach the ship.
4. At an altitude of around 100ft, and 1,200 yards from the ship, move the nozzles to 90 degrees.

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Control in the Hover

Once the aircraft is stabilized in the hover, you'll probably find that it is not over the intended landing spot. To move the aircraft in the desired direction, the line of the vectored engine thrust must be moved from the vertical. There are two ways of doing this.

1. Slightly decreasing the nozzle angle will direct the thrust backward, giving a small forward velocity to the aircraft. Increasing the nozzle angle will move the thrust forward, resulting in a small rearward velocity.
2. Pushing the nose downward slightly will deflect the thrust line enough to move the aircraft forward, while pulling it up will move the aircraft rearward. Using sideways movements of the control column will roll the aircraft slightly in the direction of control column movement. In both cases, the rudder can be used to turn the aircraft horizontally.

Vertical Landing from the Hover

1. Apply power as needed to maintain your height, and use the control column to position the aircraft for landing.
2. Once in position, reduce the engine r.p.m by a few per cent.
3. At touchdown, close the throttle to idle.
4. Move the nozzles to 0 degrees, then apply the wheelbrakes and shut down the engine.

Vectoring in Forward Flight (VIFFING)

The AV-8B has a relatively low top speed and effective ceiling compared to most fighters, but the high level of installed thrust gives it a phenomenal acceleration in flight, while rotating the nozzles forward provides equally impressive amounts of braking. The aircraft is at its best when flying below 10,000ft; tactics are more important than brute power maneuvers. In air combat, the Harrier pilot can use the vectoring nozzles to out-manuever a conventional fighter. The following techniques may be worth trying:

1. By lowering the nozzles, the pilot can increase the turn rate of his aircraft, trading speed for turn rate.
2. If the Harrier is being pursued by an enemy fighter, moving the nozzles to 100 degrees will sharply reduce forward speed, forcing a pursuer to overshoot, perhaps to the point where he becomes the pursued.
3. Lowering the nozzles at the top of a loop will pitch the aircraft quickly into a dive, allowing the pilot to quickly line up his gun or missile.
4. Set to 100 degrees or more, the nozzles can act as an brake, allowing the aircraft to dive steeply without a rapid build-up of speed.
5. If a fast dive is needed, this can be done at full power. Instead of reducing power for the pull-out, the pilot can lower the nozzles, turn at the maximum G possible, yet still have full power available after the pullout to ensure fast acceleration.

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AUTOPILOT

When engaged, the autopilot will fly you to the currently selected waypoint, and if you don't switch it off, through all subsequent waypoints. When the autopilot is engaged, an AUTO indication will appear in the HUD. An indication will also be presented at the left hand side of the instrument panel.

The autopilot can be used to fly the aircraft while the pilot is busy selecting armament or changing MFD modes, or as a convenient way of flying from one waypoint to another. During autopilot, setting the NAV system to waypoint T (the TACAN beacon on Tarawa), will fly the aircraft back to the ship, and even carry out the landing. Landing aboard Tarawa can be difficult, so beginners will find this facility useful.

EJECTION SEAT

If battle damage causes you to lose control of the aircraft, or if you run out of fuel and are about to crash, eject from the aircraft. If you survive ejection, you will be picked up either from the sea or Barcalan territory, and returned to Tarawa for a post-flight debriefing.

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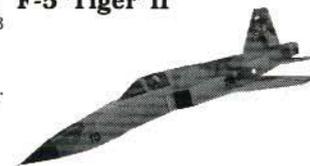
INTELLIGENCE BRIEFING**BARCALAN AIRFORCE**

The Barcalan airforce is relatively small, but well equipped. Every type of jet fighter currently in their service was good enough to be selected by the US Air Force as 'Aggressor' aircraft for the Top Gun training school.

F-16 'Fighting Falcon'

This is the newest and most potent warplane you'll face. Luckily these are the basic Block 15 version of the aircraft, rather than the newer 50/52 model of the USAF. On paper, the F-16 totally outclasses the AV-8B in air combat. However as most dogfighting takes place at lower altitudes and subsonic speeds, the F-16's advantages are less obvious. Afterburners are fuel hungry, so pilots cannot run them for long periods. Without them, the AV-8B has faster acceleration and combined with 'Viffing', makes it a difficult target. Additionally the Barcalan issue air to air missile is the older AIM-9, which is more susceptible to decoy flares. Ultimately of course, it is the superior training and skills of the USMC pilot making the difference over a less skilled F-16 pilot.

The Tiger is slightly slower than the F-16, and not as agile, but most of the tactics still apply. In sharp climb the AV-8B can out accelerate the F-5, but will ultimately lose out to the F-5's superior top speed. By using "VIFFING" the Harrier can certainly out brake the F-5 (or anything else for that matter), which if properly done will force a following pilot to overshoot, potentially into the sights of your Sidewinder.

F-5 'Tiger' II**A-4 'Skyhawk'**

This is certainly not the most high-tech or modern of fighters, but it does carry the Sidewinder missile and in the hands of a good pilot demands respect in a dogfight.

These are armed with heavy cannon and due to their slow speed are easy Sidewinder fodder. However your missile supply is limited, and tactically it makes sense to down them with the cannon. This is a lot more difficult than it looks, as slow moving vehicles are a tricky target from a fast jet. Throttle back, and try to get behind them, but watch out for that heavy cannon.

UH-1 'Huey'**TOP SECRET**

FOR VMA-513 SQUADRON MEMBERS ONLY

C-130 'Hercules'

These are slow moving cargo planes and carry no defensive weaponry. As such they are an easy target, but as they are propeller driven, provide very little heat signature for the Sidewinder to lock on to. You will therefore have to engage them with the cannon.

GROUND FORCES**Fixed Bases**

These have been set up along strategic locations such as road intersections and are usually supported by mobile units. Some additionally have SAM launchers.



SA-3 SAM
D-30 Howitzer

Mobile Units

Normal Deployment for these forces is in units of between two and six tanks supported by personnel carriers, trucks or heavy vehicles. They are usually stationed around fixed bases and villages, but can often be found as targets of opportunity en-route along supply lines.



T-59 Tanks
ZSU-57 AAA
ZSU-23 AAA
SA-6 SAM

Fuel Dumps

These are protected by significant defenses, but their destruction is the key to the success of the campaign.

Air Bases

Five airbases have been identified. All are defended by both fixed and mobile units. The two biggest air bases are Dili and Vila Salazar on the north coast. These are the main operating bases for the F-16 squadrons. The three smaller bases are Suai, Same and Viqueque on the south coast and normally used by the A-4 and F-5 forces.

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Flying Nightmares

HINTS AND TIPS

1. When attempting to distract an incoming missile, it may not be enough just to release chaff or a flare. Timing is critical. Release the chaff or flares too soon, and the missile will re-acquire you; release them too late, and the weapon will reach your aircraft before being significantly decoyed.

Pulling a sharp turn in the direction of the attack will help break the missile's lock. Never turn away from the missile - this gives it a simple "tail-chase" flight path and an easy kill. Turning toward the missile forces it to maneuver hard in order to follow you.

If you run out of chaff or flares, a sharp turn might still save you. Once again, timing is critical. The closer you let the missile approach before making the turn, the harder it must maneuver to compensate for your sharp change of course. The missile does not have unlimited maneuvering power, so what you're trying to do is to get out of its way so rapidly that it can't follow.

2. In Campaign mode, you have only a limited supply of Harriers available with which to defeat the Barcalan's. If too many Harrier's were lost completing a sortie, it is a good idea to reload the mission and re-fly the sorties. Your experience of the targets should now ensure that your losses are kept to a minimum.

3. ECM pods are usually worth the reduced payload, as dodging SAM's is a fairly distracting habit.

4. Practice firing using the unguided rockets. AGM's are cool, but they are big and heavy, so you can only carry a few. Rockets will ultimately do as much damage, and you get to carry lots!

5. Barcalan pilots will usually attempt to get you into a turning race, which you will lose, especially against the F-16's you encounter later in the game. Use the vectored thrust to brake fast and make them overshoot into your Sidewinder view.

6. Aircraft come from aircraft hangers! Destroy the hangers FIRST and sort out the bogies later, otherwise the Barcalan's will scramble more and more aircraft quicker than you can shoot them down.

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Flying Nightmares

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Thanks for playing!

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Flying Nightmares

Flight Notes

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FOR VMA-513 SQUADRON MEMBERS ONLY

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